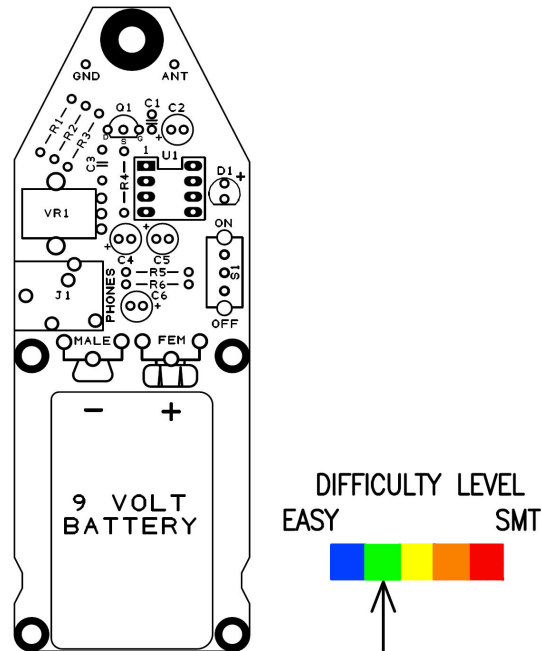




QRPGuys K8TND Sferics Receiver



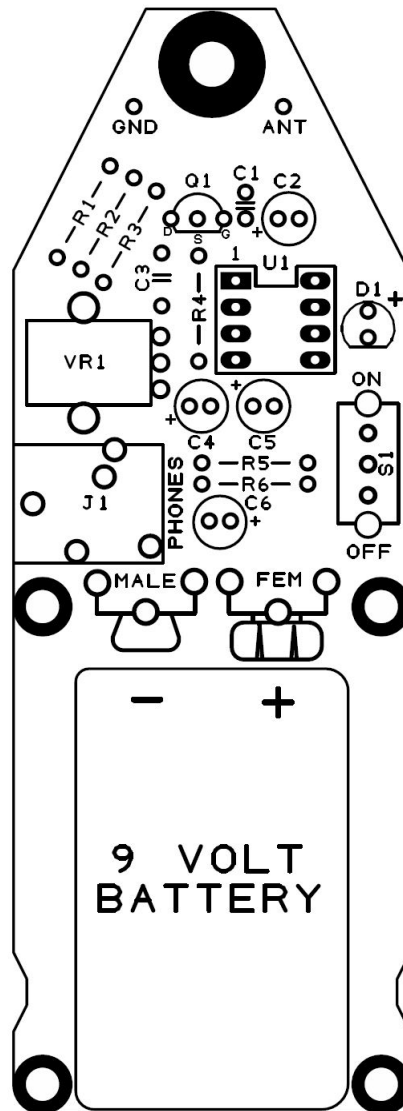
First, familiarize yourself with the parts and check for all the components. If a part is missing, please contact us at qrpguys.parts@gmail.com and we will send you one.

Please read all the instructions before starting to assemble the receiver.

Parts List

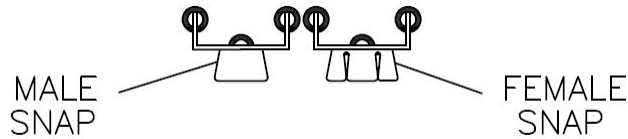
- 1 – QRPGuys K8TND Sferics Receiver PCB
- 1 – U1, LM386 DIP IC
- 1 – Q1, J310 transistor
- 1 – D1, green LED
- 1 – R1, 20 megohm resistor (red-black-blue-gold)
- 1 – R2, 10K resistor (brown-black-orange-gold)
- 1 – R3, 6.2K resistor (blue-red-red-gold)
- 2 – R4,6, 820 ohm resistor (gray-red-brown-gold)
- 1 – R5, 4.7K resistor (yellow-violet-red-gold)
- 1 – VR1, 50K vertical pot
- 1 – C1, 220pF C0G capacitor, marked 221
- 2 – C2,5 10uF electrolytic capacitor
- 1 – C3, .47 uF polyester film capacitor, marked 474
- 2 – C4,6, 1uF electrolytic capacitor
- 1 – J2, 3.5mm stereo pcb jack
- 1 – S1, SPDT slide switch
- 1 – 9V battery clip-female
- 1 – 9V battery clip-male
- 1 – 8 pin DIP socket
- 1 - 8-32 x 3/4"L SS Phillips pan head screw
- 1 – 8-32 S.S. wing nut
- 2 – 8-32 S.S. nut
- 1 - #8 S.S. internal tooth lock washer

Using the guide below, start assembling with the smallest parts first.

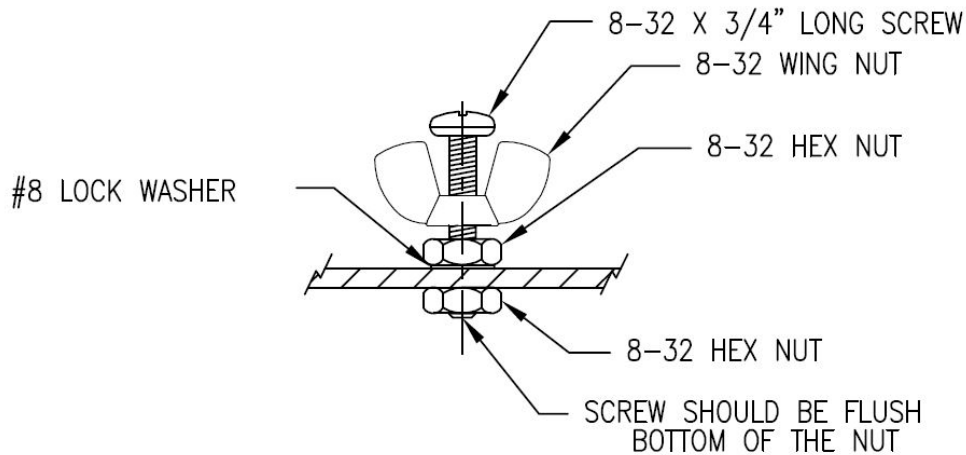


- [] Install C1, 220pF C0G capacitor, marked 221
- [] Install R1, 20 megohm resistor (red-black-blue-gold)
- [] Install R3, 6.2K resistor (blue-red-red-gold)
- [] Install R4,6, 820 ohm resistor (gray-red-brown-gold)
- [] Install R5, 4.7K resistor (yellow-violet-red-gold)
- [] Install D1, green LED, *observe polarity, the long lead is “+”*
- [] Install 8 pin DIP socket, *match the board outline*
- [] Install Q1, J310 transistor, *match the board outline*
- [] Install S1, SPDT slide switch
- [] Install C3, .47 uF mono capacitor, marked 474

- [] Install C2,5 10uF electrolytic capacitor, *long lead is “+”*
- [] Install C4,6, 1uF electrolytic capacitor, *long lead is “+”*
- [] Install J2, 3.5mm stereo jack
- [] Install 9V battery clips, as shown below

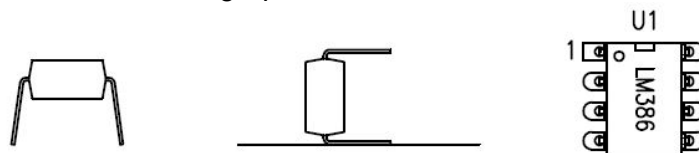


- [] Install VR1, 50K vertical pot
- [] Install the antenna connection hardware as shown below.



This completes the assembly

- [] Next, power up the receiver with a 9V battery. Turn on and the LED should illuminate. Check for 9V on pin #6 of the U1 socket. If all is ok, turn off and install the LM386 into the socket noting the position of pin 1 shown in the graphic below.



When inserting IC, the pins are flared so that they can be retained by automatic insertion tools. Gently rock it on a flat surface so the pins are parallel and it will insert into the socket more easily.

Operation:

Firstly, you must get the Sferics receiver a long ways away from any power lines or electrical wiring. When I say "long ways", a couple of couple miles away would be ideal from any electrical mains. You're also going to want to stay away from trees, they are absolute dead zones for what you want to receive. There is filtering built in, but distance is the best filter from environmental 60Hz AC hum.

For better reception, you can hold the unit above your head, with the antenna pointing straight up. You want your hand to be in contact with the exposed tinned area either side of the battery, as you act as a good ground for what we are trying to hear. The antenna is going to be a user supplied coat hanger or two foot piece of heavy gauge copper wire. Make sure the antenna wire is hooked up and tightened down.

The Sferics receiver is quite simple to operate, with nothing but a volume control to adjust. Before turning the receiver on, put a rubber band around the board and battery where the notches are. This will hold your battery in tight and keep it from flopping around.

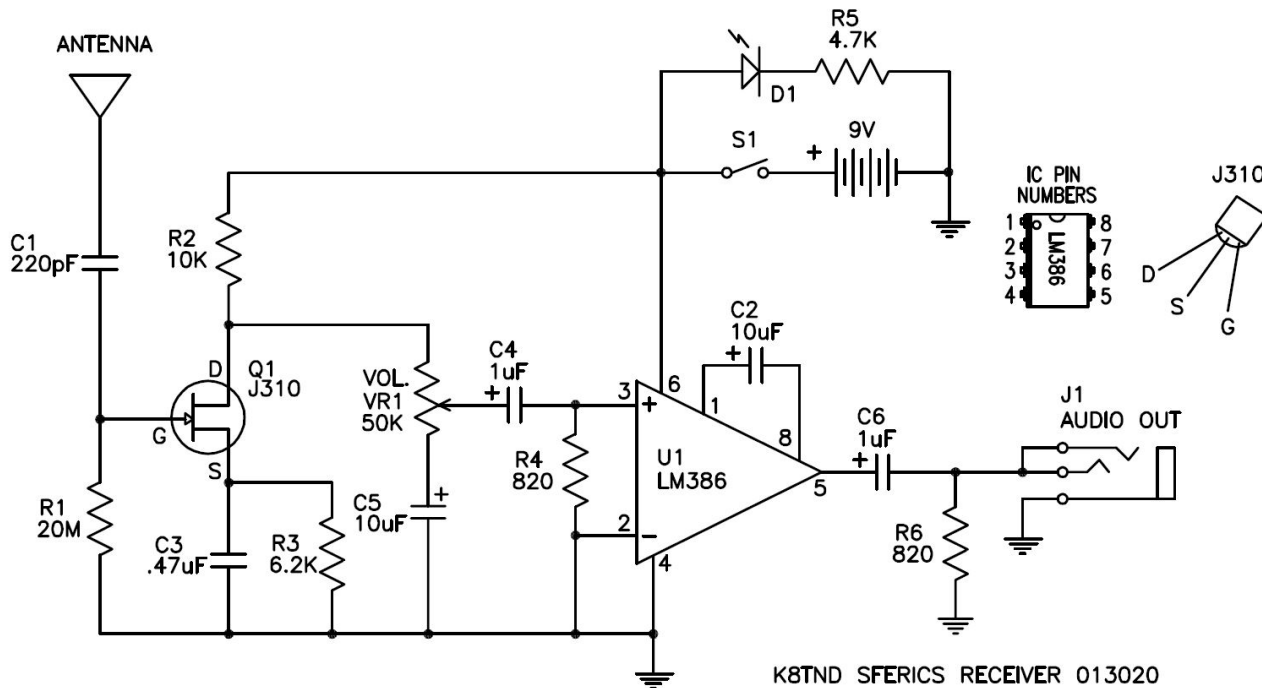
Next, turn the volume control all the way down, fully counter-clockwise and plug the headphones in. If the headphones are quiet, go ahead and put them on.

Turn the ignition off on your vehicle and take the receiver a few feet away from it. Turn the receiver on and very slowly turn the volume up until you have a comfortable listening level. At this point the AC hum level should be very low and you should be hearing the clicking and popping sounds of lightning up to a thousand miles away.

Congratulations, your receiver is now working. Enjoy the many sounds of nature and PLEASE do not use your receiver if lightning is close by.

Cliff/K8TND

Schematic:



We designed the board for two assembly options. A bare board handheld option as described here, and for those that want to utilize a chassis. The chassis option would involve not installing the pot, earphone jack, spdt switch and the antenna hardware. These items or more appropriate chassis mounted styles would be installed in your case. A small die cast aluminum chassis would be ideal.

Notes:
