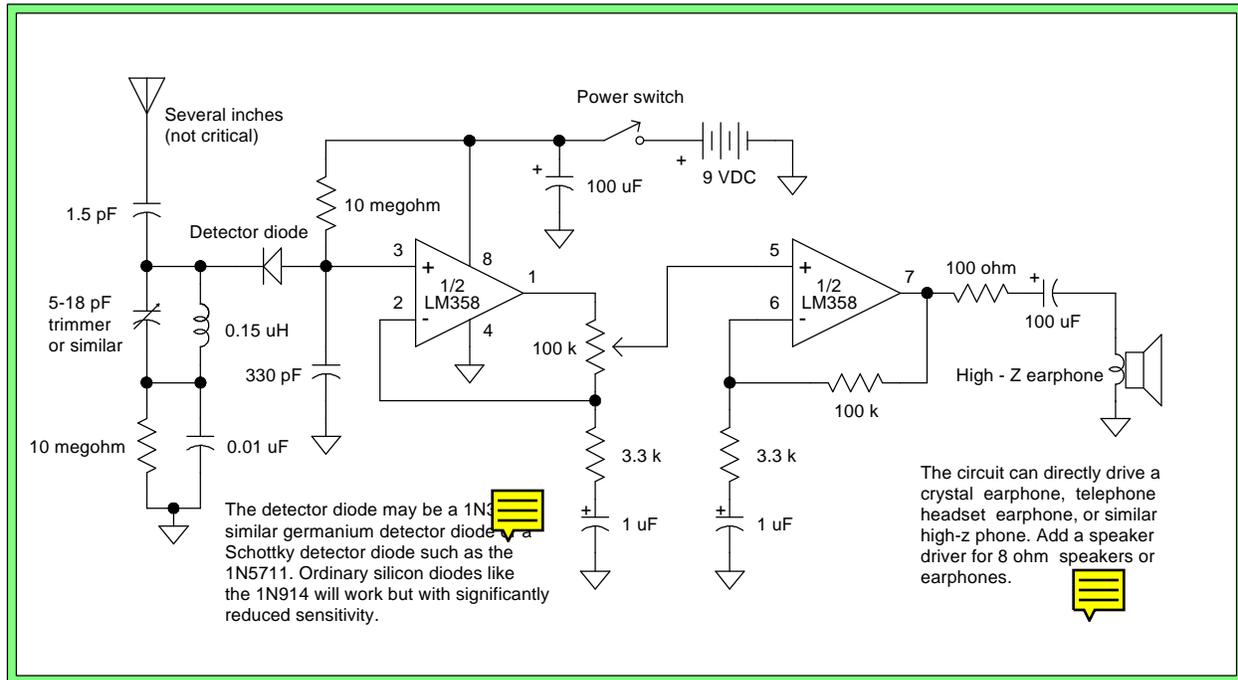


Passive Aircraft Receiver



The Passive Aircraft Receiver is basically an amplified "crystal radio" designed to receive AM aircraft transmissions. The "passive" design uses no oscillators or other RF circuitry capable of interfering with aircraft communications. Nevertheless, check the regulations before using this receiver on a commercial airliner.

The detector diode should be a germanium detector diode similar to the 1N34 or a schottky small signal diode like the 1N5711 or HP2835. The 10 megohm resistors provide a small diode bias current for better detector efficiency.

The tuning capacitor may be any small variable with a range from about 5 pF to about 15 or 20 pF. The 0.15 uH inductor may be a molded choke or a few turns wound with a small diameter. Experiment with the coil to get the desired tuning range. The aircraft frequencies are directly above the FM band so a proper inductor will tune FM stations with the capacitor set near maximum capacity. (The FM stations will sound distorted since they are being slope detected.) Other capacitor and inductor combinations may be selected to tune other bands if desired. (Try the CB band at 27 MHz.)

The LM358 dual op-amp draws under 1 ma so the battery life is quite long. A speaker amplifier may be added to drive a speaker or low-z earphone. Consider operating the speaker amplifier from a separate battery to preserve stability. (The Wenzel Associates technical library has a three-transistor speaker amplifier which will work well.)

The antenna can be a couple of inches if the receiver is near the transmitter or a couple of feet for maximum range. The selectivity is reduce as the antenna length is increased so best performance is achieved with the shortest acceptable antenna. Try increasing the 1.8 pF capacitor value when using very short antennas and decreasing it for long antennas. The receiver could be built into a small plastic box with a short antenna inside.