TRF AM Broadcast Receiver

The TRF (Tuned Radio Frequency) approach to receiver design is impractical at high frequencies (2 MHz and above), and most modern receivers are superheterodyne designs.

Superhet receivers are moderately complex and require a number of tuned stages (as well as careful alignment). The circuit shown here requires *no* alignment and has only one tuned stage. While it is practical only for broadcast reception, it can provide high-fidelity reproduction of AM broadcasts. The quality of the sound is amazing for such a simple circuit!

Circuit Description

Incoming RF is accepted by L1. L1 is a "loopstick" antenna on a ferrite rod, and C1 is a variable capacitor for tuning. The resonant frequency of L1 and C1 determines the center frequency of the bandpass filter, which controls which station the receiver "hears." The RF output from the antenna circuit (L1/C1) passes into *U1*.

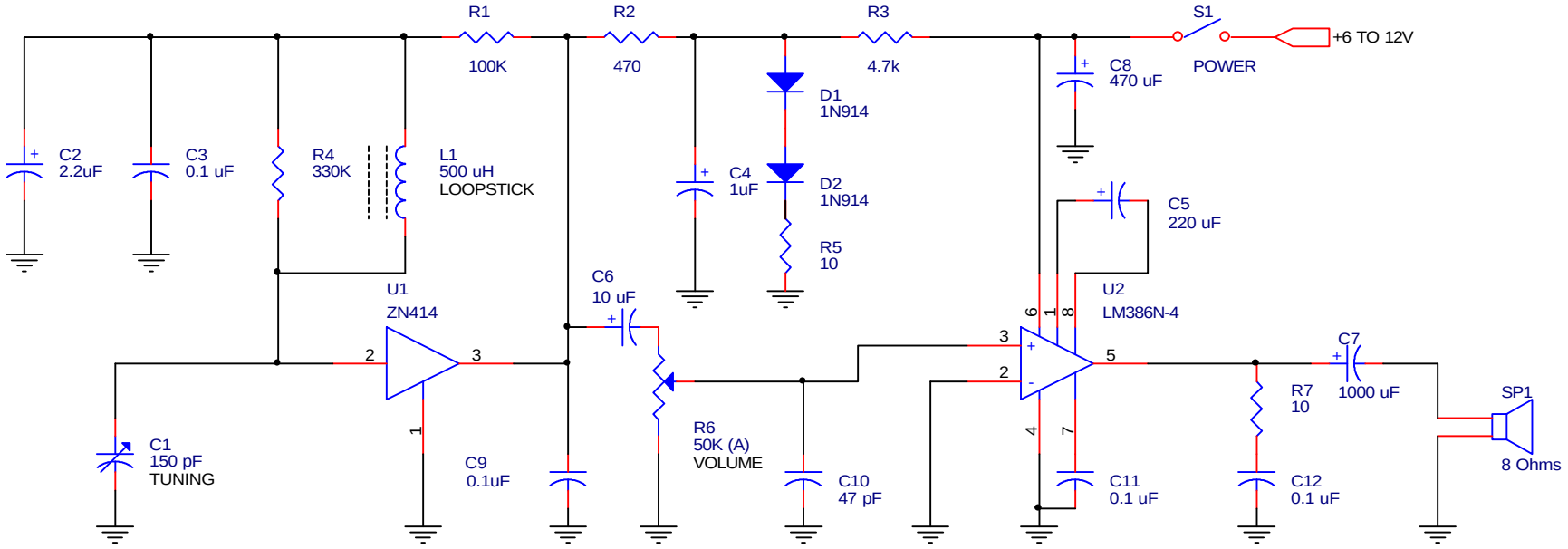
U1, a ZN414 integrated circuit, does most of the work in this circuit. U1 contains nine stages of RF amplification and an active (transistor) RF detector. U1 accepts the incoming RF signal from the antenna and bandpass selector circuit (L1 and C1), amplfies the RF signal by up to 70 dB, then detects the information.

The resulting audio signal passes through the volume control (R6) and into *U2*, and LM386 audio power amplifier. The output of U2 directly drives the loudspeaker.

Construction Hints

The construction of this circuit is not very critical. Keep all component leads as short as possible, and make sure that the output of U2 is kept away from the antenna circuit. Construction on a copper ground plane using a scrap piece of copper-clad printed circuit board works well.

This circuit is capable of high-fidelity reproduction. Use a good quality loudspeaker for best results.



CONSTRUCTION NOTES:

1. ZN414 available from ALL ELECTRONICS CORP. 1-800-826-5432
2. All capacitors 16 WV or better.
3. LOOPSTICK L1 can be constructed as 100 turns #30 wire on a 5/16" dia ferrite rod. Rod length not critical.
4. C13 should be located close to U2.
5. C7 should be close to U1.
6. Keep leads on pin 2 of U1 as short as possible, and away from the speaker leads.
7. R1 used to prevent U1 from oscillating. May not be needed in all units, depending on choice of L1 and U1 Lot number.

Figure 1: Two-Chip TRF AM Broadcast Receiver