

# Three Elements Active Directional Receiving Loop HF Antenna

**Credit Line:** *Radio- Design # 21, pp.:77- 78.*

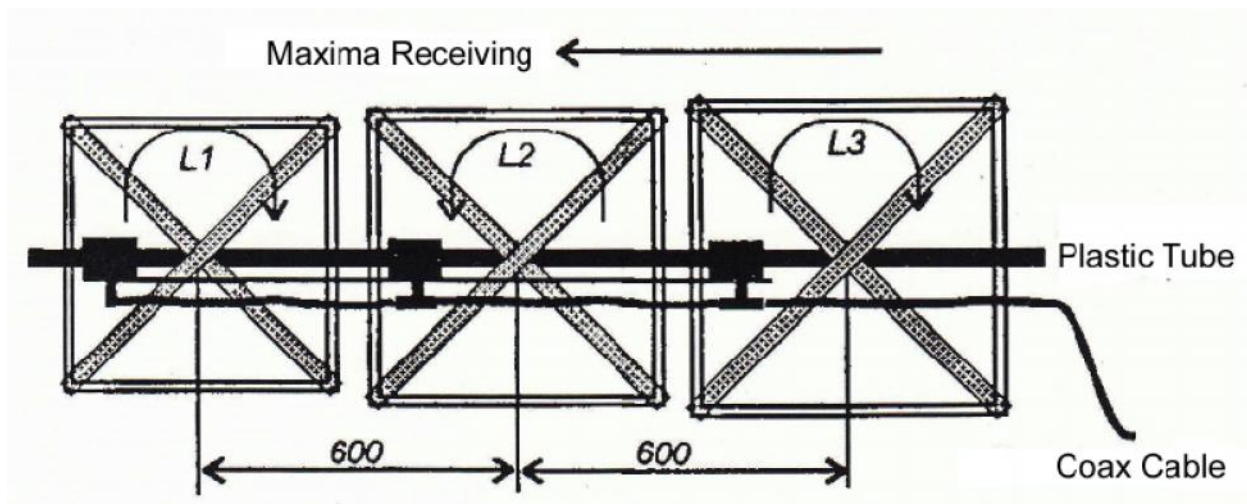
**By:** *R. I. Miller and Nikolay Vyachin (RW4CF)*

The small sized directional antenna provides excellent receiving capability ever inside a room. The antenna was designed for receiving weak signals from amateur radio stations however the antenna may be used for receiving of the broadcasting radio stations. The antenna significantly improves Signal/Noise ratio at receiving weak radio signals. **Figure 1** shows design of the Three Elements Active Directional Receiving Loop HF Antenna.

The antenna contains three wire square loops that are placed along a dielectric boom. The boom may be made from a wooden stick or plastic tube. The loops are wired with copper wire in 0.8- mm (20-AWG) diameter. The loops are placed on a form from cross wooden stick. Handling boom is placed in the center of the cross.

Distance between the centers is 600- mm. Copper wire placed along the boom that connected to the ground of the loop and ground of the RF- Amplifiers that placed near the every loop. **Figure 2** shows schematic of the Three Elements Active Directional Receiving Loop HF Antenna.

Each RF Amplifier is placed in small metal box with RF connector upside. Through a T connector the amplifiers connected together and with the main RF amplifier. Either 50- or 75 Ohm Coaxial cable may be used for the connection. The all three RF Amplifiers work on the main RF Amplifier that has a resonant circuit that tune to receiving signals.



**Figure 1** Design of the Three Elements Active Directional Receiving Loop HF Antenna

## ПРИЕМНАЯ АКТИВНАЯ МНОГОЭЛЕМЕНТНАЯ КВ АНТЕННА

*Мильер Р.И. д.т.н. Вячин Н.К., RW4CF*

Header of the Article

Main RF Amplifier as well placed in metal box. It should be placed as close as possible to the receiver. The box contains RF connector for connection to the loops and RF connector to connection to the receiver. Instead of the tuning circuit with variable capacitor it may be used several switching resonant circuits for every used band of the antenna. It is depends on the purpose of the receiving antenna.

Loops of the antenna wound in specific way. Second loop is wound in opposite direction to the first loop. So, if First Loop wound in one direction, the Second loop is wound in opposite direction to the First loop and Third loop wound in opposite direction to the Second loop or in the same direction as the First loop.

**Data for the loop of the antenna**

**Loop 1:** Wound on square with sizes of 450 x 450- mm: contains 3 turns;

**Loop 2:** Wound on square with sizes of 475 x 475- mm: contains 4 turns;

**Loop 3:** Wound on square with sizes of 500 x 500- mm: contains 5 turns.

FET transistor 2N3823 may be used for all of the three RF Amplifiers that placed near the Loop. FET transistor CP651 may be used at RF Amplifier with the resonant circuit. It is possible use modern FET transistors with the same parameters.

73! de R. I. Miller and Nikolay Vyachin (RW4CF)



Front Cover Radio- Design # 21

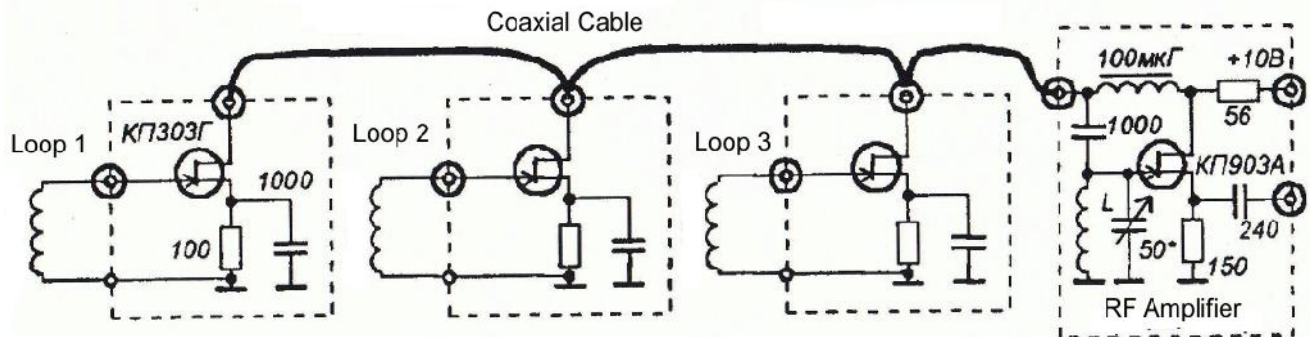


Figure 2 Schematic of the Three Elements Active Directional Receiving Loop HF Antenna