

# OLD MILITARY HF- ANTENNAS OF COMMUNICATION CARS

Igor Grigorov, RK3ZK  
[antentop@mail.ru](mailto:antentop@mail.ru)

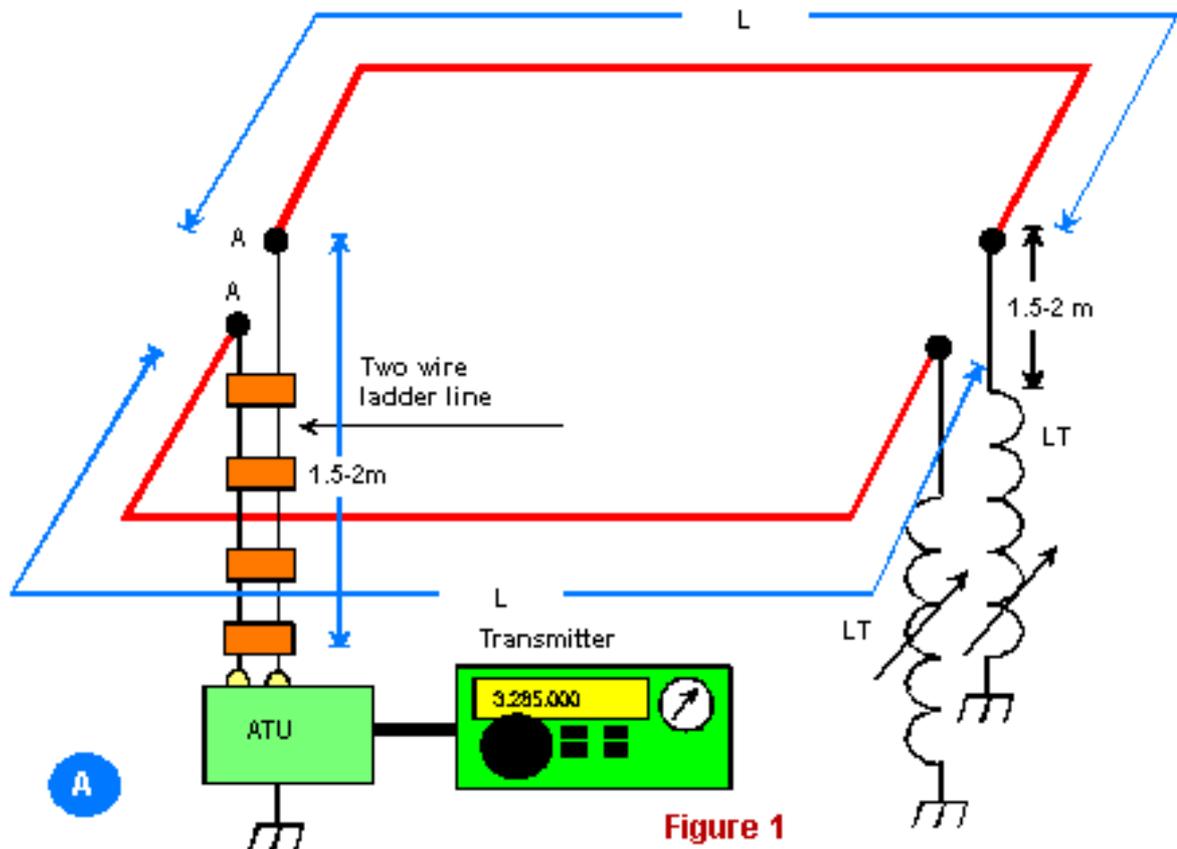
*I have a small collection of information about old military HF antennas used over the World. Presently, three old military automobile HF antennas are described at the article. The antennas are written "as it is," i.e., I give all information, that I have had. I know, the information is not complete at all, but, nevertheless, the information is interesting and it can help somebody to make own 'car antennas.'*

### Tuned dipole

Tuned dipole exhibited in **Figure 1** was used in army of the USSR. Scheme for the antenna is shown in **Figure 1a**. Tuned dipole made from a strong tube that has diameter 15 to 30 mm. The tube is installed at height of 1-1,5 m above the roof of an automobile and goes out approximately on 1 meter for overall

dimensions of the automobile, as it is exhibited in **Figure 1b**. Tuned dipole has high radiation both at low and high (mostly) angles. It allows the antenna to make links by earth and reflected from ionosphere wave.

**Figure 1** Tuned dipole



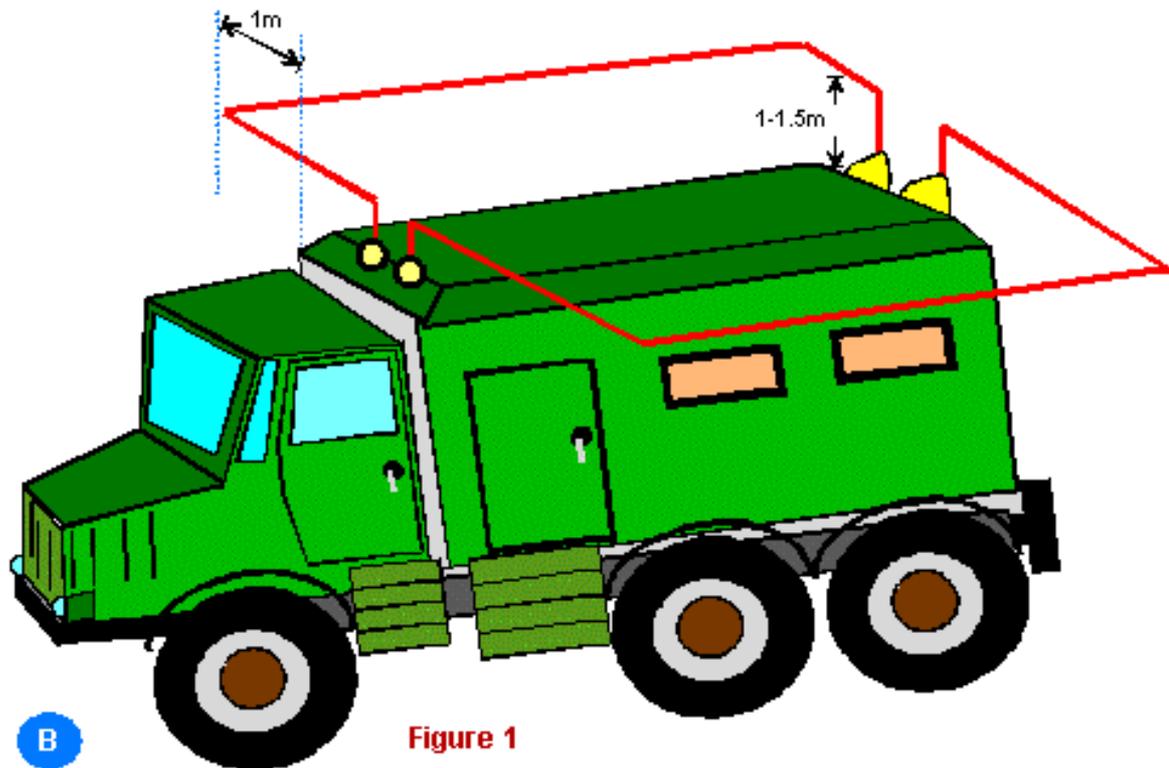


Figure 1

Length 'L' of the antenna (see **Figure 1a**) depends to dimensions of a car, where the antenna is installed, usually the length close to 6 meters. The antenna feeds with help a short length of a two-wire line, usually the length is equal to 2- 3 meters, an ATU is used. Antenna is adjusted with help of a symmetrical variometer 'LT' installed at opposite ends of the tuned dipole. The antenna is tuned on maxima of RF current to points 'A'. In such case the antenna ensures maximum effective work. But in the manual of the antenna is pointed, that the antenna in some cases can be tuned on maxima of RF voltage on points 'A'. Such set-up for the antenna is possible if the communication car is placed on a good conducting surface (it can be moist salty soil) or by operation from natural shelters - holes, ravine. Inductances of antenna variometer vary from several microhenry up to 300 microhenrie. The antenna works good at 2-25 MHz.

At usage of this antenna in military communication car, the antenna gives that advantage, that the roof of the automobile remains free. It enables to install on the roof other antennas, for example, for VHF-UHF ranges

### **Folded dipole**

Folded dipole was in use within the World War – II and till 70s of the 20 century. The dipole is a wire folded by meander and loaded to serial coil plus a capacitor. **Figure 2** shows the disposition of the folded dipole on communication car. The antenna is located at the altitude approximately at 1-1,5 meters above the roof. **Figure 3** shows the scheme of the antenna. Wings of the folded dipole

could reach to 10-15 meters in length. It depends on sizes of the car.

Folded dipole is fed by two-wire ladder line in length about 3 meters. The line is connected to an ATU. The antenna is tuned on maxima of RF current to points 'A'. Folded dipole is tuned in resonance in the operation frequencies with help of loading spools 'LT' together with capacitor 'C', that made as a constructing part of the car.

The antenna is intended for 60-90 meters, and usually does not work at other ranges. . Folded dipole has strongly radiation to the sky and a little to the horizon.

### **Dipole with low characteristic impedance**

Dipole with low characteristic impedance is intended for a work at wide frequencies range and for installation on the roof of a communication car that has small dimensions. **Figure 4** shows the scheme (**Figure 4A**) and disposition (**Figure 4B**) of the dipole on communication car. I must say, that I have seen some photos, where the antenna was installed athwart to the roof, as it is shown at **Figure 4C**. The antenna is located at the altitude approximately at 1 meter above the roof. Wings of the dipole made as a metal grid has shape, crosswire at the cells soldered. The wing of the dipole has the width in (0,5-1,5)-meters and the length (1,5-2)-meters.

**Figure 5** shows the scheme of feeding of dipole with low characteristic impedance. The antenna is connected through a two-wire ladder line in about 2 meters length to an ATU. The ATU has a resonance

Figure 2 Folded dipole placed on communication car

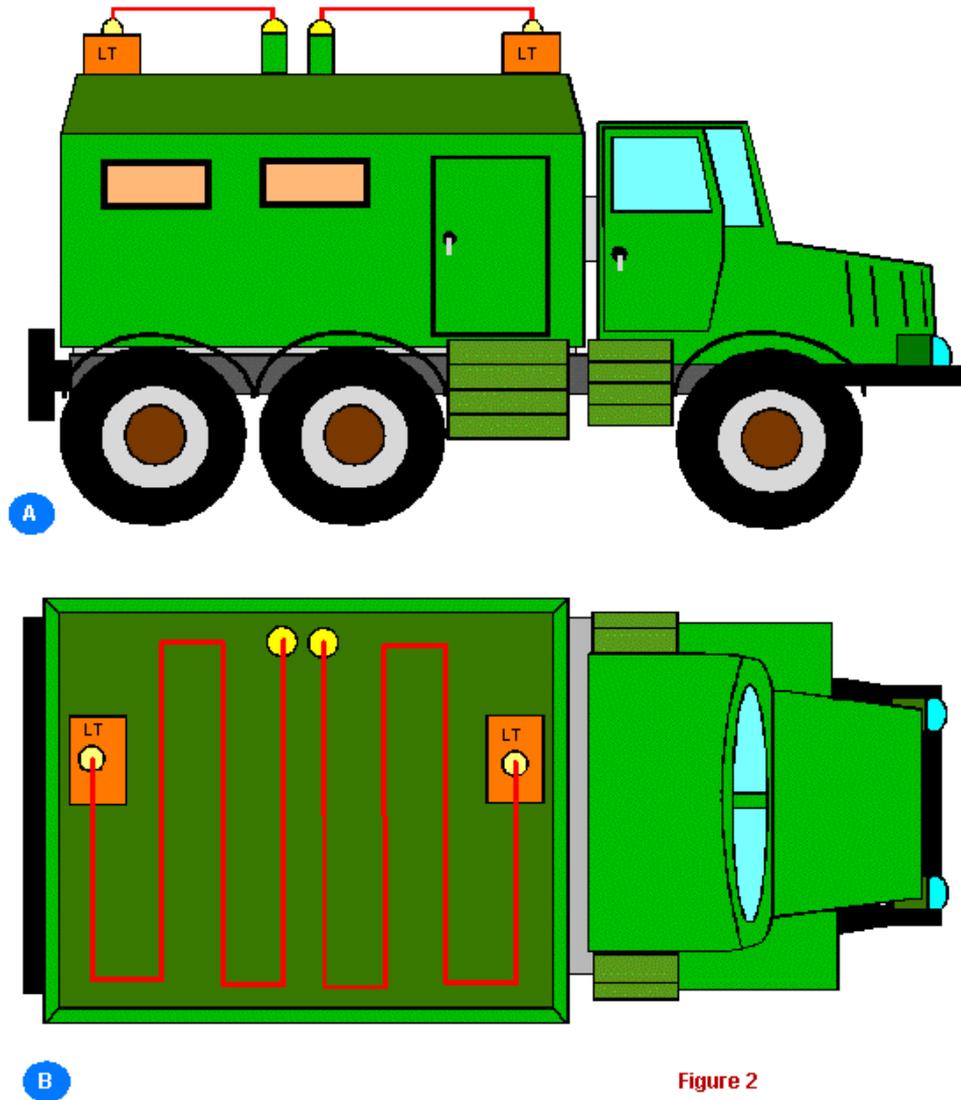


Figure 2

Figure 3 Scheme of the folded dipole

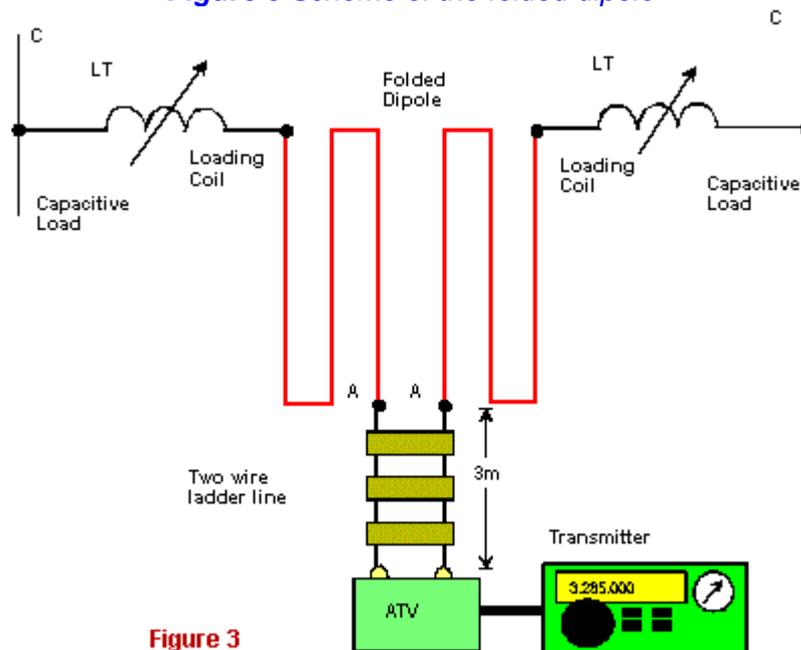


Figure 3

Figure 4 Dipole with low characteristic impedance

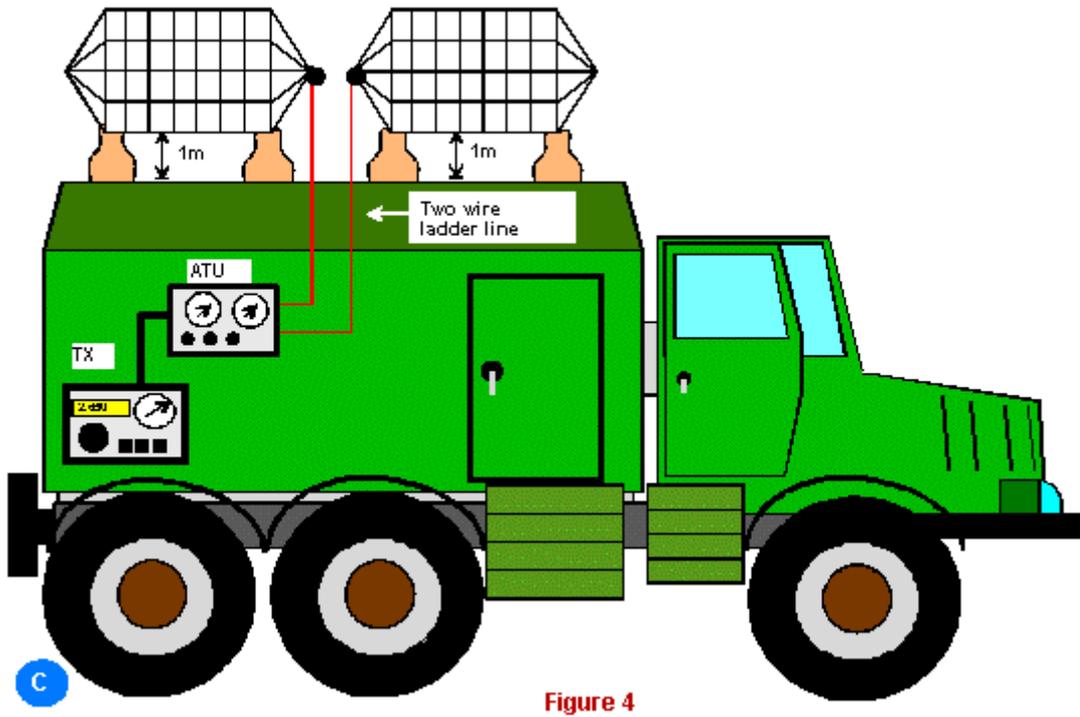
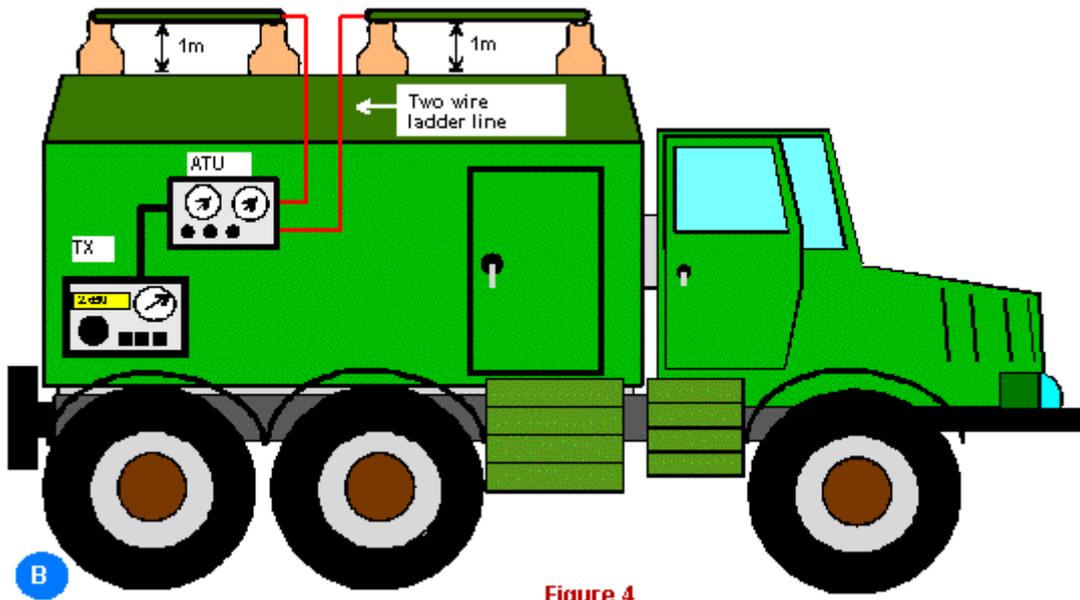
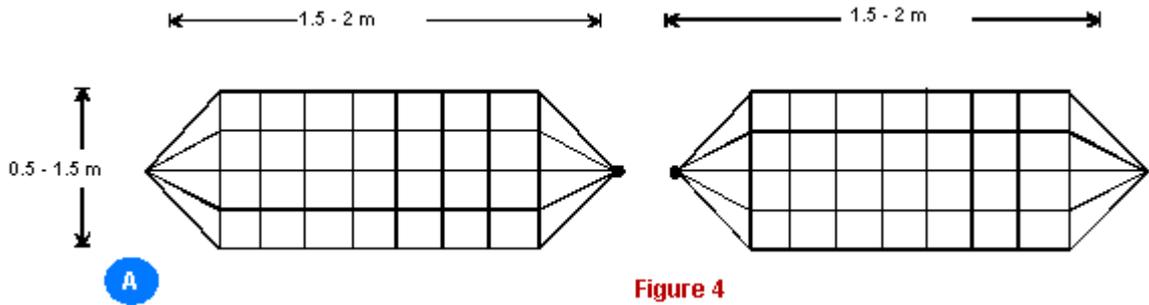


Figure 5 Scheme of feeding of dipole with low characteristic impedance.

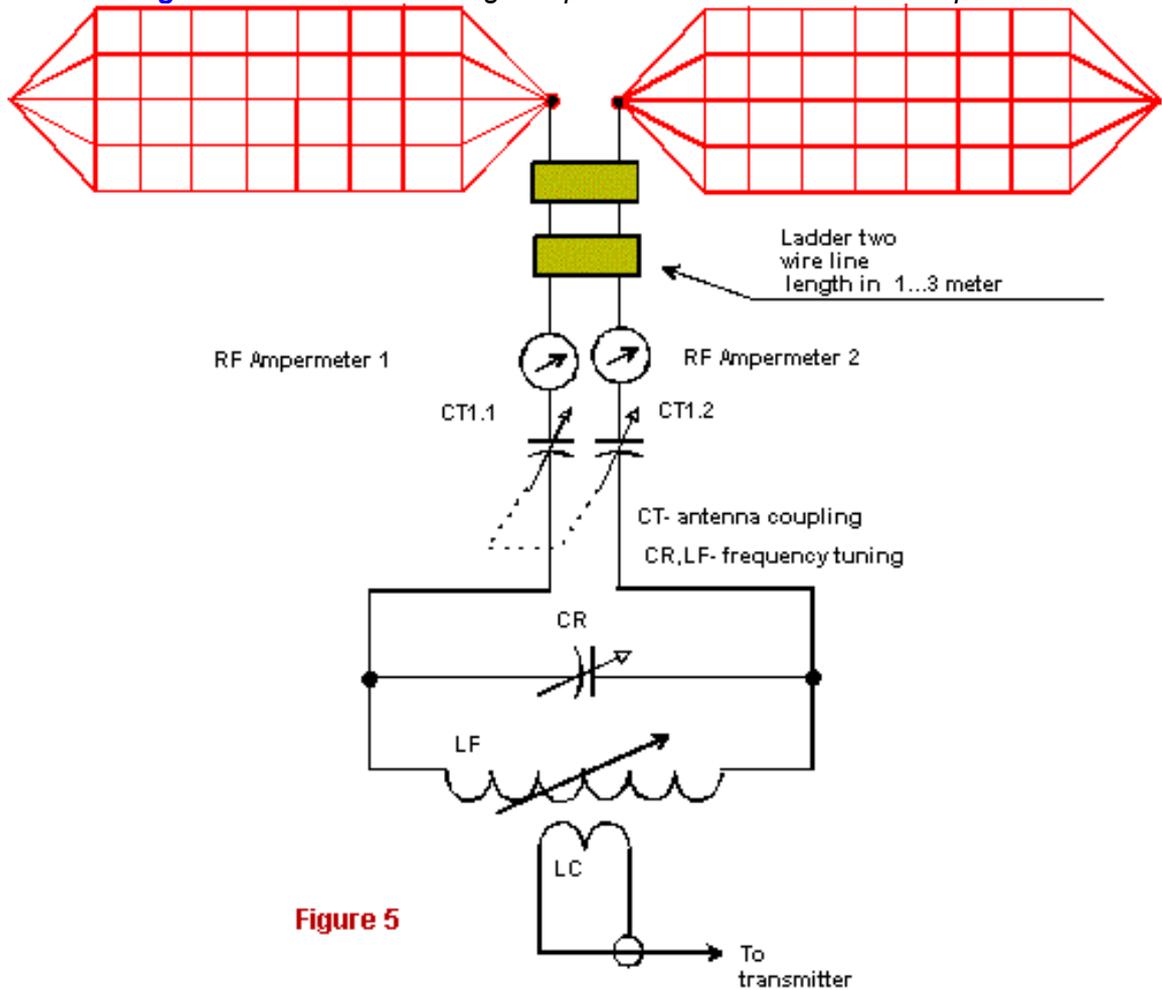


Figure 5

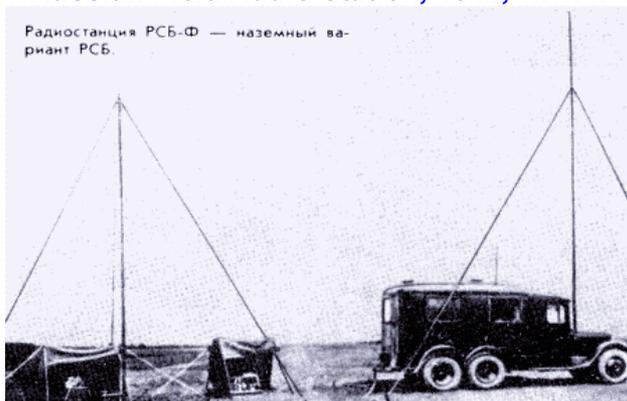
circuit 'LF- CR', that is coupled with help of coupling coil 'LC' with a transmitter. With the help of variable spool 'LF' and variable capacitor 'CR' this circuit can be retune in the frequencies range of 2-20 MHz. In the same frequency range the antenna works. Maxima of RF current in to the antenna is installed with the help of variable symmetrical capacitor 'CT.'

Such antenna was widely used in communication cars during the World War-II and some time after the

war. The antenna ensures the sure communication with zenith radiation in HF range 2- 4 MHz in radius of 200-300 km from the antenna. Also this antenna ensures long-distance communication in HF ranges 5-20 MHz.

But this antenna had the deficiencies: at the first, it has too complicated matching device, at the second the antenna takes too much place in the roof of the car. For these reasons, since of the end of 50s, the antenna practically is not used in military communication cars.

Russian Field Radio Station, 1941, w.w.-II



Russian Field Radio Station, 1913, w.w.-I

