COJOT

MORE THAN ONE WAVELENGTH

# Removable Dipole Radiator for Vehicle and Mast Installations

A White Paper

# Introduction

COJOT has developed a multiuse antenna concept that allows a quick platform change in rapidly changing field situations. The main advantage of this smart installation solution is that no tools are needed for mounting the antenna. The concept consists of a removable dipole radiator and a separate mast mount adapter that will be presented in this document - providing an ideal solution for multiple usage scenarios.

The removable dipole radiator can be mounted onto a vehicle base or attached to a mast, depending on the need and situation in the field. For example, the removable dipole radiator can be easily removed from the vehicle when parking in a shelter or when needed to make space in the vehicle.

*Figure 1 - Removable dipole radiator mounted onto a vehicle*

Furthermore, if needed, the removable dipole radiator in combination with the MASTMO can be easily mounted to a tree or any other suitable location (non-metallic recommended to avoid effects on the antenna radiation characteristics) (see pictures below). This kind of usage for example may be needed, if the vehicle is parked to an underground location where it will be required to have access to your ground-based communication system. Quite often the received signal level can also be increased by elevating the antenna from a vehicle roof, for example with a telescopic mast. In such kind of scenarios this concept provides a perfect solution for the users' needs.

*Figure 2 - Removable dipole radiator attached to a Mast*

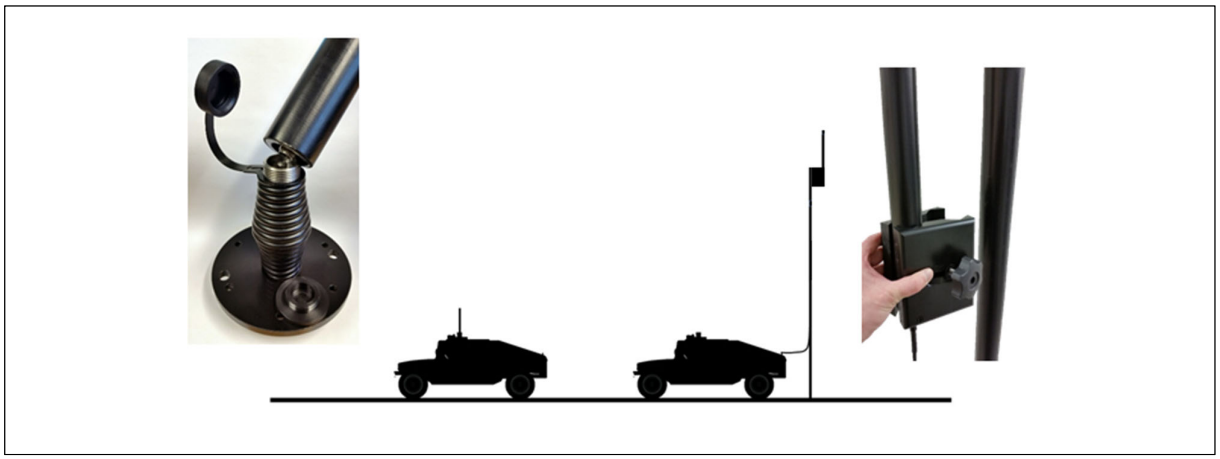

*Figure 3 - Vehicle installation (Left) and Mast installation (Right)*

The picture below shows the items related to this concept. These are the vehicle antenna that features a removable dipole radiator (for example the COJOT WD2250M-R antenna) and a smart mounting device, called MASTMO, allowing for a quick and easy fixed-site installation, e.g. to a composite mast (Ø 50 - 60 mm). The mast mount antenna solution is also offered as a separate product (see for example WD2250M-B).

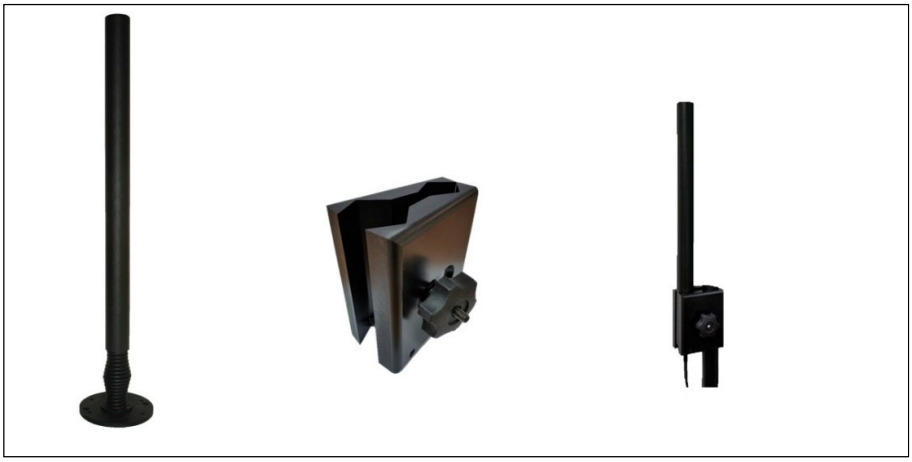

*Figure 4 - Vehicle antenna with a removable radiator (WD2250M-R) on the left, MASTMO (in the centre) and the antenna radiator mounted to a mast (WD2250M-B) on the right.*

## Vehicle antennas with a removable dipole radiator

COJOT offers various vehicle antennas that consist of a vehicle base and a removable dipole radiator. The vehicle bases have a N-Type RF connector for the radiator and antenna cable. The unit has a shock absorption spring and a flange for 4-hole US and 3/6-hole NATO patterns. Protective caps are available for the vehicle base and radiator side to protect the RF connector. The figure below gives an idea about the vehicle antenna versions.

*Figure 5 - Vehicle mounting of the removable dipole radiator*

The vehicle installation meets the environmental specifications below:

| | |
|---|---|
| Temperature range (operating) | -40 ... +71 ºC |
| Temperature range (storage) | -40 ... +85 ºC |
| Humidity | MIL-STD-810E Method 507.3 Procedure III (cycle with extreme at 95 % RH, +60 ºC) |
| Shock | MIL-STD-810F, Method 516.5 Procedure I (terminal peak sawtooth shock pulse, peak 40 g, duration 11 ms, three shocks in each of three orthogonal axes in both positive and negative direction) |
| Random Vibration | MIL-STD-810F, Method 514.5 Category 24 – All material – minimum integrity test, exposure levels according to Figure 514.5C-17 |
| Blowing Rain | MIL-STD-810F, Method 506.4 Procedure I (rainfall rate 150 mm/h, wind speed 30 m/s) |
| Water Immersion | MIL-STD-810F, Method 512.4 Procedure I (depth 1 m) |
| Beam Impact Resistance | Impact at 40 km/h at 70 % height of the radiator |
| High Voltage Isolation | 20 kV (antenna element) |
| Wind Speed | 190 km/h |

## Mast Installation

In the below picture the removable dipole radiator is attached to a Ø 50 mm composite mast with the MASTMO. The mounting can be done without any tools. The antenna cable is directly connected to the N-type RF connector of the radiator. The figure below gives the idea of mounting the removable dipole radiator to a mast.

*Figure 6 - Mast mounting of the removable dipole radiator*

The mast installation meets the environmental specifications below:

| | |
|---|---|
| Temperature range (operating) | -40 ... +71 ºC |
| Temperature range (storage) | -40 ... +85 ºC |
| Humidity | MIL-STD-810E Method 507.3 Procedure III (cycle with extreme at 95 % RH, +60 ºC) |
| Blowing Rain | MIL-STD-810F, Method 506.4 Procedure I (rainfall rate 150 mm/h, wind speed 30 m/s) |
| Water Immersion | MIL-STD-810F, Method 512.4 Procedure I (depth 1 m) |
| Wind Speed | 50 m/s |

## Performance

From the below gain graphs, the antenna performance is good in both scenarios, i.e. when mounted onto a vehicle or attached to a mast.

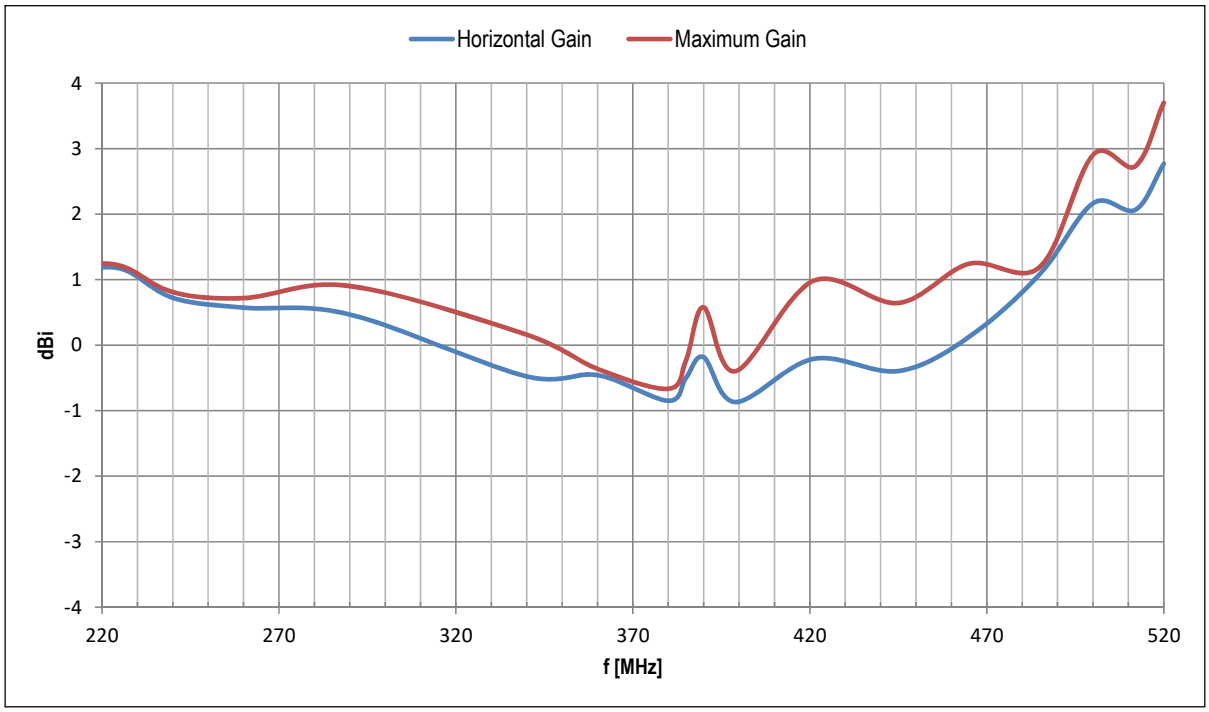


*Figure 7 - Antenna gain (Mast installation)*

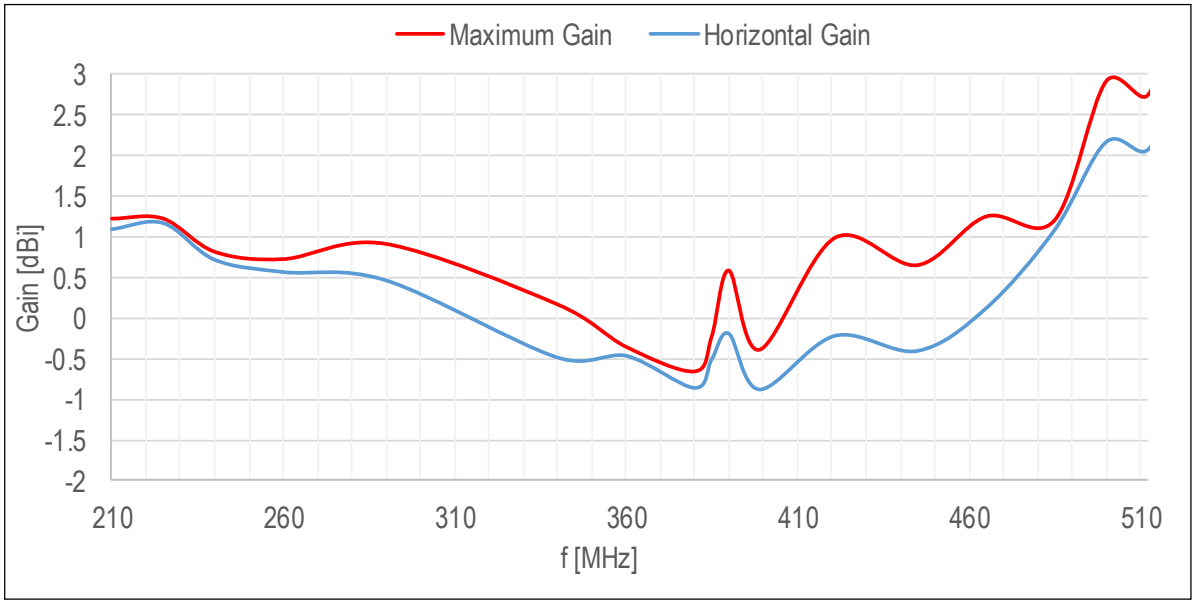


*Figure 8 - Antenna gain (vehicle installation)*

## Conclusion

The removable dipole radiator is a smart solution for situations where a quick and easy set-up of the antenna to a vehicle or a mast is required. The removable dipole radiator is easy to use in the field as it can be change without any tools and it will only take a couple of minutes to move the radiator from a vehicle to a mast and vice versa. This concept gives the same excellent antenna performance in both, vehicle and mast, installations.

## About COJOT

COJOT is specialized in Wideband Antennas for the 20 – 6000 MHz frequency range. COJOT products are used in the military market globally. COJOT is a private limited company headquartered in Espoo, Finland. More info at www.cojot.com.