

PROCEDURE FOR ANTENNA FIXING & CABLE ROUTING



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Abstract

This document details Procedure for Antenna fixing & cable routing of Train Collision Avoidance System(TCAS)

DOCUMENT CONTROL SHEET

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CHANGE HISTORY

#	Name of the Document	Date	Reason for changes	Version No.
1	Procedure for Antenna fixing & cable routing	09/06/2021	Initial Document	1.0
2	Procedure for Antenna fixing & cable routing	13/08/2024	Monopole Antenna added	1.1

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1 PURPOSE:

The purpose of this document is to give comprehensive guidelines and set of procedures to be adopted for carrying out the Procedure for Antenna fixing & Cable routing.

2 SCOPE:

This procedure covers the installation of following antennas on RF communication towers. It also covers the routing, fixing and termination of RF cables on the Radio Tower Unit (RTU).

- Folded di-pole antenna
- Monopole antenna
 - Installation of antenna on the tower
 - Routing the RF cable
 - RF Cable joining
 - Termination on RTU

3 RESPONSIBILITY AND AUTHORITY:

Installation & Commission in-charge shall be responsible for implementation and maintain the operating procedure.

4 TOOLS & EQUIPMENT REQUIRED:

1. Screw and nut driver kit - 1 No
2. Cordless Heat gun, Dewalt DCE530 - 1No
3. Tape Kapton/Silicon 1/2"
4. Adhesive Epoxy S-1125
5. Butyl Tape, size 2mm thick, 50.8mm Width
6. Heat Shrinkable boot 27mm
7. Stainless Steel cable tie, 100mm length

5 PROCEDURE:

5.1 Folded dipole / Mono pole antenna :

1. Below is the dipole antenna with loose cables(Refer **fig1**)



Figure 1 : Dipole Antenna

2. Tie the cables by using stainless steel cable tie at four locations.(Refer **fig2**)

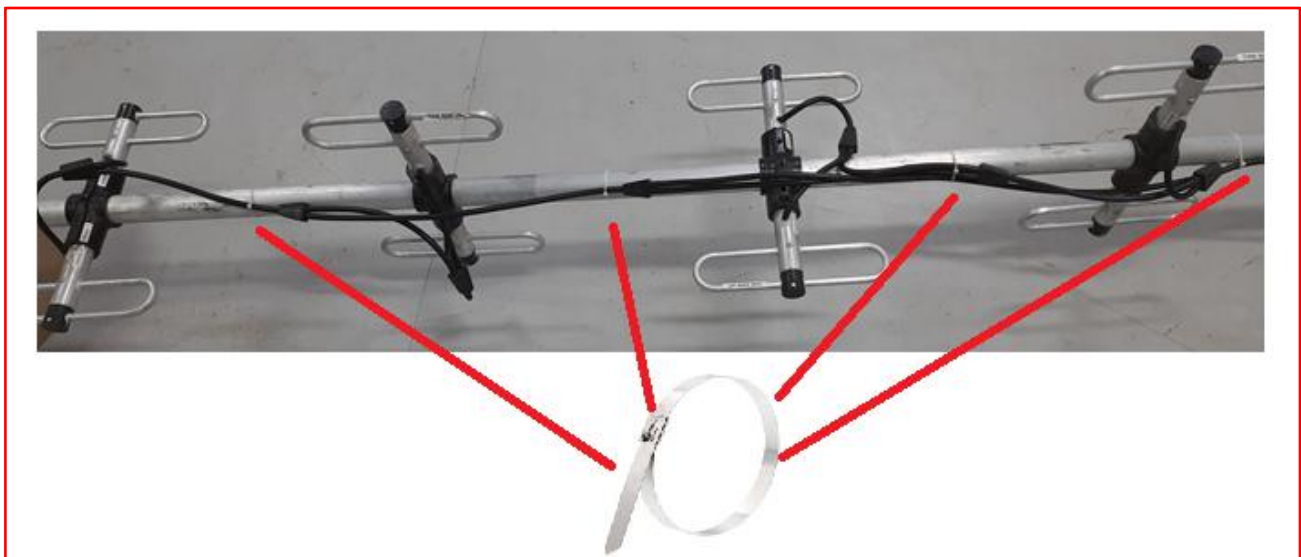


Figure 2 : Cable ties at 4 locations

3. Now place the Antenna on the tower.(Refer **fig3**)

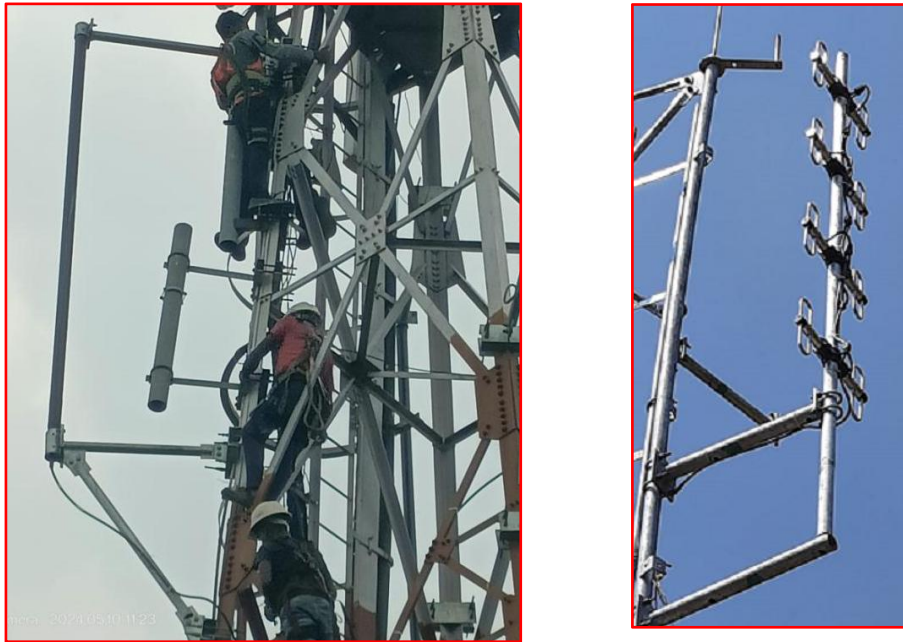


Figure 3 : Antenna

5.2 Joining RF cable :

1. Insert the boot 250MM length in to antenna cable(Refer **fig4**)



Figure 4 : Boot

2. Connect both antenna connector and LMR 600 cable connector(Refer **fig5**)





Figure 5 : Antenna & LMR600 connector

3. Wrap Kapton tape, heat resistive, over the connectors and on both sides of the cable(Refer **fig6**)



Figure 6 : Kapton tape

4. Wrap butyl tape over kapton tape on antenna connector side to match the diameter w.r.t LMR 600 cable side(Refer **fig7**)



Figure 7 : Butyl tape

5. Place the boot, over both connectors spreads equally on both sides



6. Apply heat over boot and ensure that shrinks uniformly and firmly



7. Apply adhesive epoxy, S-1125, on both ends of the boot to avoid the ingress of dust and water(Refer **fig8**)

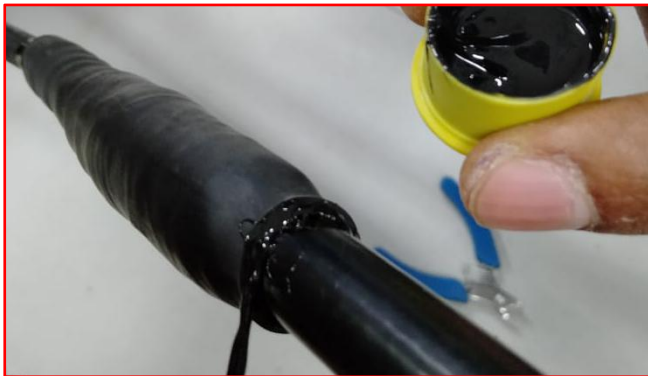
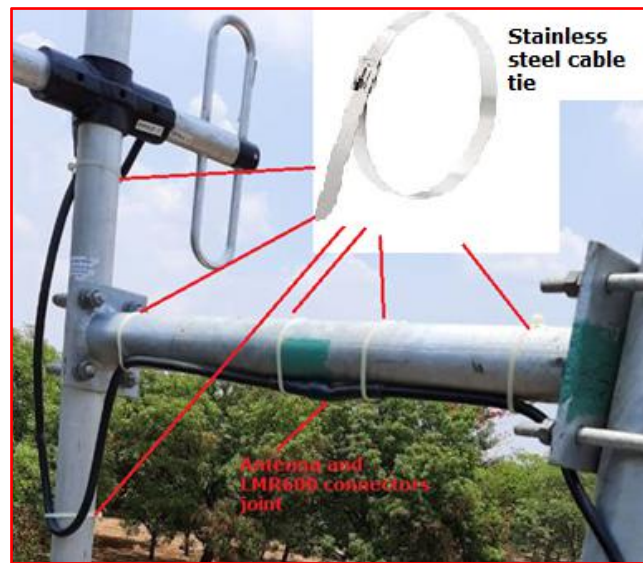


Figure 8 : Epoxy

5.3 Routing RF cable :

1. Place the antenna connector and LMR600 connector's joint horizontally and fasten the cable to tower by using stainless steel cable tie at six locations
2. This avoids the strain on joint and the connectivity will be stable.
3. After this point, all the four LMR600 cables, one from each antenna, can be routed using cable feeders from antenna to RTU.
4. Ensure that the cable feeders tighten enough to hold the cables firmly.





Note: This feeder clamps should be implemented in existing towers also.

5. The feeder clamps are supplied for tower(New & Existing) LMR 600 cable laying purpose from the factory to sites as per the document: "6000038559-I&C Kit for STATION_TCAS"

5.4 Termination of RTU :

1. Place the RTU at the defined location i.e approx. 10mtr above the ground.(Refer **fig9**)





Figure 9 : RTU Fixing

2. Connect other end of antenna cables from TX1, TX2, RX1 & RX2 to respective SPDs on rear side of the RTU.





Figure 10 : Cable routing

3. Tie the cables to structure by using stainless steel cable ties.
4. Connect each SPD body to earth by connecting the earth wire (4sq mm) from each SPD body (lug) to earth pit and ensure it get connected properly.
5. Connect earth wire, 35sq mm, between earth lug on RTU to earth pit.