ANTENNA EXPERTS

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AP-145028 1300 – 1600 MHz. 2.4 Meters 28dBi. Gain

INSTALLATION MANUAL – GRID PARABOLIC ANTENNA

NOTICE:

Installation, maintenance or dismounting of the antenna system requires qualified and experienced personnel. **Antenna Experts** Installation instructions have been prepared and are meant for skilled personnel only.

Antenna Experts disclaims any liability or responsibility as a result of improper or unsafe installation practices.

MATERIALS AND FINISH:

Following materials are used for the fabrication of Grid Parabolic Antennas and its accessories.

Grid Parabolic Reflectors:	6063T6 Aluminum, Silver Gray paints finish.
Mounting Hardware:	All stainless steel, Silver Gray paints finish.
Fasteners:	All Stainless Steel.
Dipole Feed:	All Aluminum with silver gray paints finish outside.
Insulator:	TEFLON.

01 INTRODUCTION:

AP series grid parabolic antenna **reflectors** consist of two equal parts for ease of shipping and handling. When assembled, the antenna can be mounted on a pipe having a maximum O.D. of 115 mm.

01.1 GRID PARABOLIC REFLECTORS:

Grid parabolic reflector are supplied in TWO equal **segments** for easy of shipping and handling. Four jointing flanges are fitted on the reflector, two at supporting rim and two at supporting arcs.

01.2 UPPER SUPPORT ARM:

Upper support arm is supplied to hold the antenna from top. Upper support arm includes M12 “U” bolt hardware and a section of “U” type channel with teeth on both edges.

01.3 LOWER SUPPORT ARM:

Lower support arm is supplied with the antenna to hold the antenna from lower side. **Lower support arm** consists of elevation adjustment mechanism along with M12 “U” bolt hardware and locking nuts/bolts.

01.4 STOPPER:

A **stopper** is supplied with the antenna to hold the weight of the antenna during installation and adjustment.

01.5 ADJUSTABLE AZIMUTH SIDE STRUT MECHANISM:

The **adjustable azimuth side strut mechanism** is supplied to provide fine azimuth adjustment of the antenna and to impart maximum rigidity to the grid parabolic antenna. The azimuth **adjustable side strut** can be installed either on left or right hand side of the antenna.

01.6 NON-ADJUSTABLE AZIMUTH SIDE STRUT:

The non-adjustable side strut is supplied for the rigidity of the antenna structure so as to comply with the specified wind pressure.

01.7 ELEVATION ADJUSTMENT MECHANISM:

An **adjustable elevation mechanism** is supplied with the antenna to provide fine elevation adjustment of the antenna.

01.8 DIPOLE FEED:

Dipole Feed having N-Female termination is supplied with the antenna along with feed holder.

01.9 DIPOLE FEED SUPPORTS:

4 Nos. of dipole feed supports are supplied to keep the **dipole feed** at focal point of the Antenna. These are made of stainless steel.

01.10 TRIANGLE PLATES:

8 Nos. of **triangular plates** are supplied with the antenna. 4 Nos. of triangle plates are used to hold the **dipole feed supports** at rim flange while the remaining 4 Nos. of triangle plate are used to fix the **side strut** on the rim assembly at back side of the reflector. Use two plates for Vertical polarization and 2 plates for Horizontal polarization.

02. PACKING LIST

Sl. No.	Item/Description	Quantity
01.	Parabolic Reflector in Two segments.	1 Set.
02.	Dipole Feed.	1 Each.
03.	Upper Support Arm complete with “U” bolt.	1 Each.
04.	Lower Support Arm complete with “U” bolt.	1 Each.
05.	Stopper to hold the Antenna on mounting pipe.	1 Each.
06.	Adjustable Side Strut Mechanism.	1 No.
07.	Non-Adjustable Side Strut.	1 No.
08.	Support pipe for Side Struts.	2 Nos.
09.	Supports Boom/wire to support the dipole feed.	4 Nos.
10.	Triangle Support Plates for Dipole Feed Installation.	4 Nos.
11.	Triangle Support Plates for Side Struts Installation.	4 Nos.
12.	Installation Instruction.	1 Each.
13.	Test Report.	1 Each.

03. PREPARATION:

It is recommended that the antenna is assembled in a flat clear area as close as possible to the final lifting point. Unpack all the materials and inspect for any shipment damage.

04. MARKING:

A serial number sticker is provided at the supporting arc near jointing flange on both segments of antenna. Before attempting to assemble an antenna, make sure that the both sections of the antenna bear the same serial number markings.

05. ASSEMBLY OF REFLECTORS:

Turn both segments of **parabolic reflectors** upside down and assemble the reflectors using **four flange plates**, two at **rim assembly** and two at **Arc assembly**, using M8x40 hardware as shown in the figure below. Do not fully tighten hardware at initial stage. Leave all flange hardware loose until after all M8 bolts have been inserted. After aligning all the flanges, tighten all the hardware.

06. ASSEMBLY OF SUPPORT PLATE FOR DIPOLE FEED & STRUT INSTALLATION:

Eight triangle plates are supplied with the antenna. Assemble four triangle plates on the front side of the rim of parabolic reflector, using M8x40 hardware. These are to fix the **supports boom/wire of dipole feed** on the rim. Assemble the four-triangle plate on the backside of rim of the reflector using M8x40 hardware. These are to fix the **azimuth side struts** on the rim at the backside of reflector.

07. INSTALLATION OF DIPOLE FEED:

The **Dipole feed** is precision component, which should be handled with special care during installation. For instance, always carry the dipole feed supporting both ends using both hands. Any damage may degrade the antennas performance.

Install the Dipole-Feed from the backside of Parabolic Reflector on the Aluminum Square Rod, by using FOUR nuts/bolts that are fixed on the aluminum square rod.

Please note that all the four **triangle plates** should be installed either at **left hand side or right hand side** of the flange. This is to keep the square support booms in the center of flange. As result of this the dipole feed will get fixed at exact **focal point** of the parabolic reflector.

Take extreme care during installation that the Dipole Feed must be parallel to the grid members. In other words the polarization of **grid members** and Dipole Feed must be **same**. Do not install the dipole feed 90 Degrees to the grid member.

08. PLANE OF POLARIZATION:

Select the plane of polarization of the antenna. A marking of V and H is provided at the **aluminum square mounting blocks** that are welded on the **support arcs**.

09. INSTALLATION OF UPPER SUPPORT ARM:

Fix the **upper support arm** at the **upper aluminum square mounting blocks** that are welded on the **support arc**, using the M12x100 hardware. Tighten the first nut sufficiently to take up free up/down movements of the support, than tighten the **second nut** against the first. Assemble the "U" channel and M12 "U" type bolt.

10. INSTALLATION OF LOWER SUPPORT ARM:

Fix the lower support arm at the **lower aluminum square mounting blocks** that are welded on the **support arc**, using the M12x100 hardware. Tighten the first nut sufficiently to take up free up/down movements of the support, than tighten the **second nut** against the first. Assemble the "U" channel and M12 "U" type bolt.

11. INSTALLATION OF ADJUSTABLE AZIMUTH SIDE STRUT:

Assemble the Adjustable azimuth side strut as shown below. The **adjustable azimuth side strut** can be installed either left or right hand side of the antenna. The adjustable side strut is flexible to move up/down or left/right for ease of mounting the side strut either on **antenna mounting pole** or any leg of the tower.

A "U" type channel is bolted with side strut pipe using M8x75 hardware. The far end of side strut is shown below. M8x25 nut is welded on the "U" type channel, use M8x25 hardware to fix this end of side strut at triangle plate of the side strut that is fixed at back of the reflector. **Do not fix the strut pipe towards aluminum flange.** See pictures for more details.

12. INSTALLATION OF NON-ADJUSTABLE SIDE STRUT:

The installation of non-adjustable side strut is similar to the adjustable side strut. We recommends to mount the side struts straight back on the tower to provide highest mechanical support to the antenna structure and also to avoid the conjunctions on the antenna-mounting pipe. This will also make the **azimuth tracking** an ease job. **Do not fix the strut pipe towards aluminum flange.**

Please note that if the adjustable side strut is fixed at left hand side of the reflector than the non-adjustable side strut should be install at right hand side of the antenna.

13. HOISTING ON TOWER:

The following material is required to hoist the grid parabolic antenna on the tower, not supplied by **Antenna Experts**:

1. Crane
2. Rope hoisting line/set
3. “D” clamps
4. Ropes
5. Pulley
6. Compass
7. Socket wrenches for Hexagon nuts and bolts
8. Nail puller
9. Tape measure

Attached the one end of **rope hoisting set** to the left mounting studs and other end of rope hoisting set to the right mounting studs (**Upper Aluminum Square Section)** which are welded on the back of support arcs, using “D” shackle/clamp, taking care that the **hoisting eyes** at top to fix the **hook** of **crane.**

Fasten two **ropes** in the two mounting studs **(Lower Aluminum Square Section).** These two ropes are used for optimal balance of the antenna due to the wind and to avoid hitting the antenna with tower. Slowly lift the antenna with the crane into **upright** position.

14. INSTALLATION OF ANTENNA ON THE TOWER:

When the antenna is hanging free in the hoisting ropes, mount the **stopper** on the mounting pipe, at the required height and direction and care fully tighten the nuts M12 of the U-bolts.

Position the antenna on **Stopper** and loosely mount the M12 U-bolts of upper support arm just above the stopper so that the stopper can hold the weight of the antenna during installation and tracking. Now loosely mount the U-bolts M12 of lower support arm.

Align the antenna as exactly as possible to the specified direction, using the **compass**, so that later fine adjustment of +/- 10 degrees is possible.

15. ELEVATION ADJUSTMENT:

Using a **tracking mechanism**, which is fixed on the lower support arm, can do elevation tracking. Before attempting the elevation tracking, make sure that both M12 “U” bolt hardware of Lower support arm and Upper support arm are **fully tight** and all the locking nuts/bolts are fully loose. Rotating the tracking mechanism clock wise results in **up-tilt tracking** where as rotating the tracking mechanism counter clockwise results in **down-tilt** tracking.

16. AZIMUTH ADJUSTMENTS:

Two side struts are supplied with the antenna. First, the **adjustable side strut** should be installed. Fix the **“U” type bracket** on the side strut pipe using M8 “U” bolts hardware. Make sure that the adjustable assembly should be parallel to the side strut. While making the **azimuth tracking**, the other side strut should be free from the tower.

Before attempting the azimuth tracking, make sure that all the **locking nuts/bolts M12x40** and both the M12 “U” bolts hardware of Upper and Lower support arms are **fully loose**. Rotating the **tracking handle clock wise** results in **left hand side tracking** where as rotating the **tracking handle counter clockwise** results in **right hand side tracking**.

Now fix the other side strut on the tower. Do not tighten the locking nuts/bolts at this stage.

17. FINAL ADJUSTMENTS AND LOCKING THE HARDWARE:

Carefully repeat the azimuth adjustments to get the **maximum signal strength** and lock all the locking nuts/bolts and all M12 “U” bolts hardware.

18. FINAL CHECK:

When the installation of the antenna has been completed, it is necessary to ensure that the installation instructions have been followed in all aspects.

It is especially important to recheck that the all nuts/bolts are tightly **locked.**

All ropes may then be removed.

19. MAINTENANCE:

Qualified, skilled personnel to verify proper installation and maintenance should inspect antenna system once a year.

Take VSWR reading by using RF Network Analyzer. The VSWR should never exceed 1:1.5.

Keep the record of VSWR measurements for future reference.