



Maintenance Manual for Satellite Earth Station Antenna

Maintenance for satellite antenna and its control system is an important guarantee for the safe and high-quality operation of satellite communication and TV broadcasting system. It requires high technology; the maintenance work has the features of long time and arduousness, but prolongs the lifetime of the whole system. Therefore, it is needed to examine and test the equipment regularly so that the problems can be solved in time. Mastering the maintenance method, identifying and eliminating the trouble quickly and accurately, and improving maintenance efficiency are all important to ensure the normal and reliable running of the satellite antenna and its control system.

Key points for maintenance:

● **Antenna Control System**

- Check the beacon receiver and working condition of ACU air fan frequently; make sure the cooling part perform well.
- Dust the beacon receiver and ACU regularly; make sure the equipment work normally.
- Take effective measures on insect and rat prevention; cover the feed tube port and examine it regularly.
- Long-running ACU and beacon receiver have higher requirements for the environmental temperature, so the user should check if the cooling system is normal or not. The normal phenomenon is that the fan blower will stop working because of aging, which will lead to the temperature in cabinet increasing and make the machine working unstably. Generally the user can replace the fan to eliminate this trouble.

● **Mechanical Structure**

- Check if the drive motor of antenna Az and El runs normally and has abnormal noise.
- Check if the protective jacket of antenna Az and El jackscrew is aged or damaged. It needs regular inspection and timely replacement. Please add MoS₂ as required. Please refer to the red marks in fig 1.



Fig 1



Fig 2

➤ Check if antenna Az and El lacks of grease. Add grease according to the requirement. Please refer to the red marks in fig 2, fig 3, fig 4, fig 5, and fig 6.



Fig 3



Fig 4



Fig 5



Fig 6

- Check if antenna Az and El limit switch is rusted and aged. If required, need change a new one timely. Please refer to the red marks in fig 7 and fig 8.



Fig 7



Fig 8

- Check if the electricity cable of antenna Az and El drive motor is aged or damaged.
- Check if the reduction gearbox lacks of lube. Add lube according to the requirement; usually use MoS₂ as the lube. Please refer to the red marks in fig 9 and fig 10.



Fig 9



Fig 10

- Check if the metal components are loosen, deformed or rusted. If needed, please loosen the components, clean the rust and do paint repair timely.
- Check if the feed coating is aged or damaged. Change the coating according to the requirement. Please refer to the red mark in fig 11.



Fig 11

- Check if the feed blowing rain system unit is normal. It needs regular checking. Please refer to the red marks in fig 12 and fig 13.



Fig 12

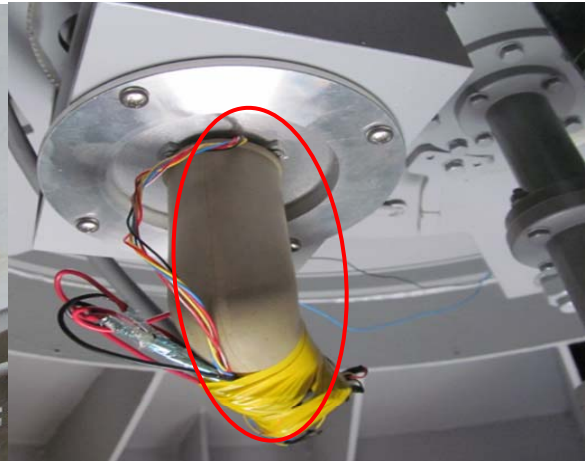


Fig 13

● **Antenna Panels Handling**

- Check if the paint on antenna reflector falls off, you should choose specialized white paint with high frequency and low insertion loss, and can't use the ordinary white paint to replace.



Fig 14



Fig 15



Fig 16



Fig 17

- Please measure the ground resistance value of antenna regularly which should be less than

4Ω. And check the lightning-protection and anti-thunder device.

- **Antenna Foundation System**

- Choose corresponding model of grease and antiseptic paint to change the grease and do paint mending regularly. Please refer to the red marks in fig 18, fig 19, fig 20 and fig 21.



Fig 18



Fig 19

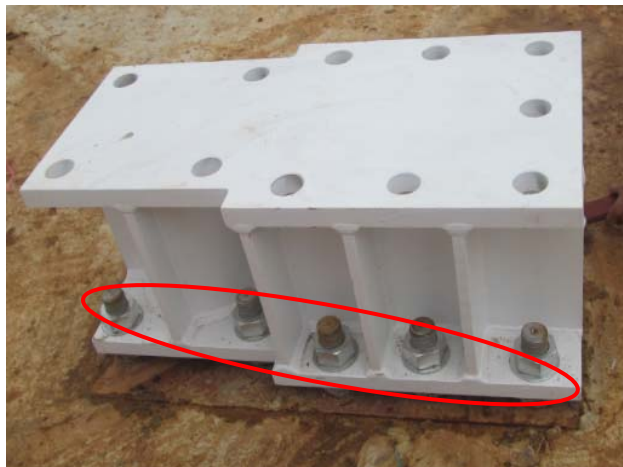


Fig 20



Fig 21

- When the antenna cannot rotate, firstly please check if it's the antenna controller's problem, after eliminating the trouble of the antenna controller, and then you should mainly check Az or El limit switch. This part is usually the normal closed contact. The main reason is that wind and rain corrosion always leads to the poor connection of antenna limit switch contact. It should be checked and changed regularly.

- **Attention for Antenna Maintenance**

- If there must be someone standing on the main reflector, only 1-2 light person can be allowed. Besides, they must wear soft-soled shoes and try to stand on the steel bar of beams so that the



reflector won't be deformed and damaged.

- When doing paint repair and painting grease, the fasteners should be loosen. If meeting strong wind, the loosen fasteners must be tightened in time. Then begin again when the wind stops.
- Most ADU are with high voltage of 380V. When doing maintenance, all the working electricity must be cut off.
- The user should avoid that somebody stay on the antenna working site.

● **Table for Maintenance Contents and Items Requirements**

Maintenance Contents	Categories	Maintenance Items and Requirements
Antenna	Antenna tracking and servo system	Tracking system and mechanical servo system checking; Different modes and function transition of ACU checking (Surface of each equipment and system is dust-free and works normally)
	Antenna mechanical and electrical part	Tracking system and mechanical servo system checking; Different modes and function transition of ACU checking (Surface of each equipment and system is dust-free and works normally)
	Antenna mechanical part	Clean the antenna outdoor platform and feed cabinet; Check the outdoor waveguide, various cable connecting and outside surface; Fill grease to each lubricating point and check the beacon light (Platform and feed cabinet cleaning, waveguide and cable connecting normally, surface without damage, fill grease to the lubricating point when needed, beacon light working normally)
Maintenance tools and materials	Manual grease gun	Fill grease into grease gun, and aim at the Az and El grease nipple to inject into.
	MoS ₂ grease	Azimuth and elevation motor reducer, Azimuth and elevation jackscrew(The black leather case should be taken apart)
	Topcoat	BS-04-xx, PUR, Acrylic polyurethane enamel
	Paint brush, cleaning cloth and sand paper	Clean the dirt on the reflector and components, sand papering to remove the rust, and finally paint the surface with topcoat.