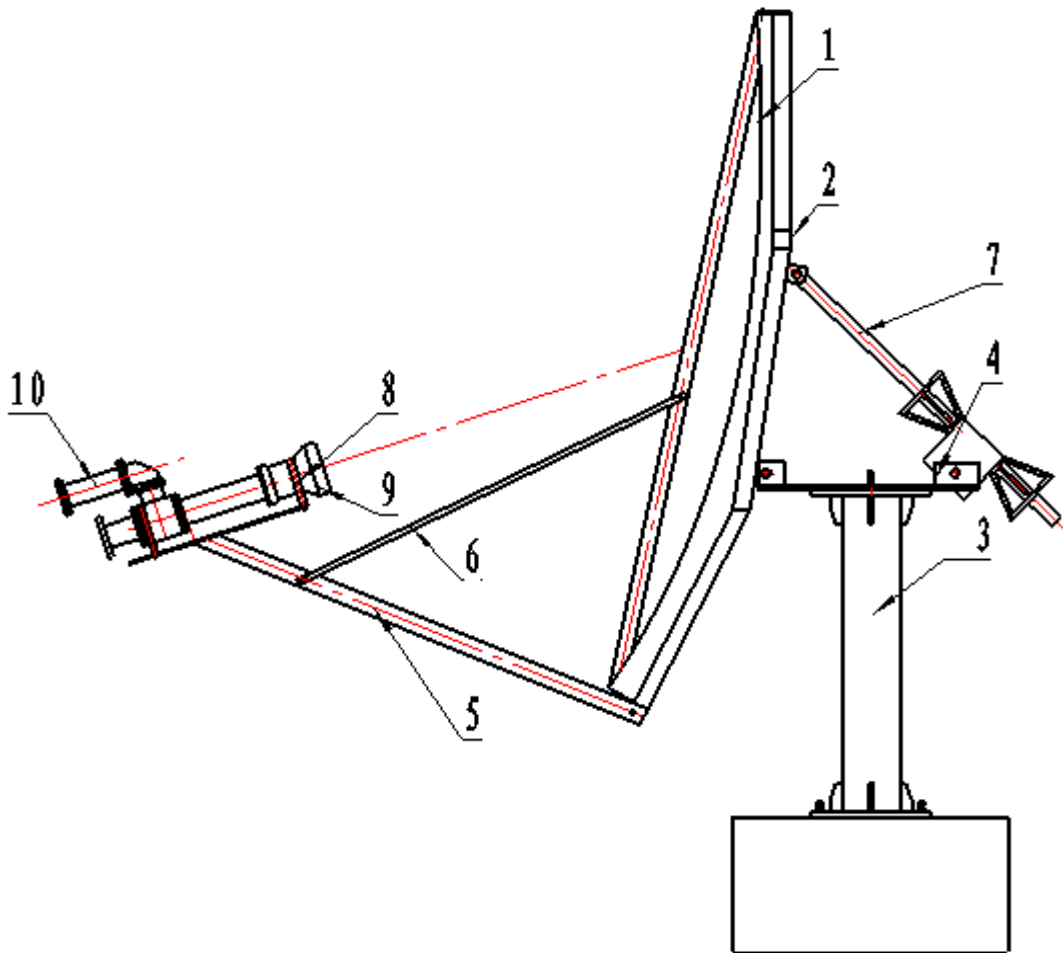


1.8m C-Band stationary antenna

Quick Installation and service manual



Welcome

This manual is to setup and maintain the Level421 1.8 antenna system. The antenna is optimized and designed as a small-aperture antenna used in VSAT satellite communications. It serves as a SATCOM remote station antenna and VSAT system remote station antenna. It applies to C-band and can get configured to work as LINEAR or CIRCULAR polarized.

The main reflector is made of high precision aluminum alloy shaped up via quenching and drawing.

Moreover, the antenna has a stable column structure pedestal, is reasonably designed with high accuracy, nice appearance, convenient to install, easy to operate, high mechanical strength, strong durability and high re-installation accuracy.

Despite other antennas in the market the level421 1.8 meter antenna system gets delivered INCLUDING an pedestal mounting which allows easily to mount the antenna to concrete surface.

Optional the antenna feed system can get fitted with a CIRCULAR polarizer which allows to use the unit on all C-Band satellites in orbit today.

The polarizer can get configured to operate LHCP (Left Hand Circular Polarized) or RHCP (Right Hand Circular Polarized). The setting depends from the satellite used.

Technical Specifications

Electrical specifications

Item	C-Transmit	C-Receive
Frequency (GHz)	5.85 ~ 6.425 GHz	3.625 ~ 4.200GHz
Gain (dBi)	39.5dBi	35.4dBi
Beam width (-3dB)	1.85°	2.97°

Polarization mode		Linear Orthogonal Polarization	Linear Orthogonal Polarization
First sidelobe		$\leq -14\text{dB}$	$\leq -14\text{dB}$
Cross polarization isolation		$\geq 35\text{dB}$	$\geq 35\text{dB}$
Isolation Tx-Rx		$\geq 85\text{ dB}$	$\geq 85\text{ dB}$
VSWR		1.25 : 1	1.25 : 1
Insertion Loss of Feed		$\leq 0.2\text{dB}$	$\leq 0.2\text{dB}$
Noise temperature	20° EI	$< 47^\circ\text{K}$	$< 47^\circ\text{K}$

An optional Circular Polarizer is available for the level421 1,8 meter antenna. Contact level421 Support in order to understand how to configure your Circular polarizer for the satellite you point to. Configuration is satellite specific.

Mechanical specifications

Item	Parameter
Reflection surface accuracy	$< 0.5\text{mm (RMS)}$
Mount style	Azimuth/Elevation
Tracking mode	Manual
Weight	100kg
Azimuth range	$\pm 180^\circ$
Elevation range	$0^\circ \sim 70^\circ$
Polarization range	$\pm 95^\circ$
Operational wind speed	20m/s 27m/s (Gusty)
Survival wind speed	56m/s
Operational temperature	-30 degrees ~ +55°C
Relative humidity	10% ~ 100%
Seism (Survival)	0.3G's horizontal 0.1G's vertical

Installation Instructions

Prior starting with the installation, please check if all components did arrive with your shipping. Note that in case you detect missing components, level421 only will be able to supply spares if the boxes have been arrived undamaged. In case you detect damaged or opened boxes get the confirmation of the shipping company prior you do accept the shipment.

Foundation Specifications

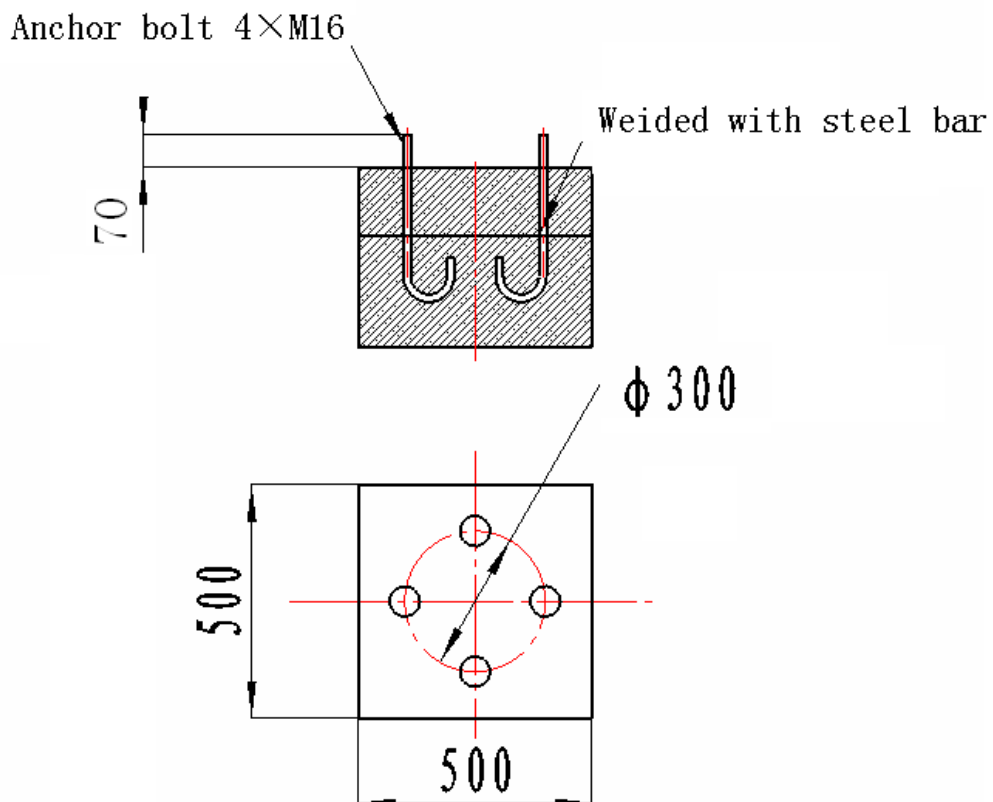


Fig.1 Foundation Technical Requirements

The level of foundation shall be higher than the ground surface by 200~300mm. The position of anchor bolts shall be arranged for connecting with the reinforcing steel bar in the concrete base strictly according to the requirement of the drawing. The foundation shall be formed by processing of cast at one time. The anchor bolts shall be kept parallel strictly with each other, and all of them shall be perpendicular with the ground surface. The upper plane of base shall be flat and level.

Assemble Sequence
Step 1

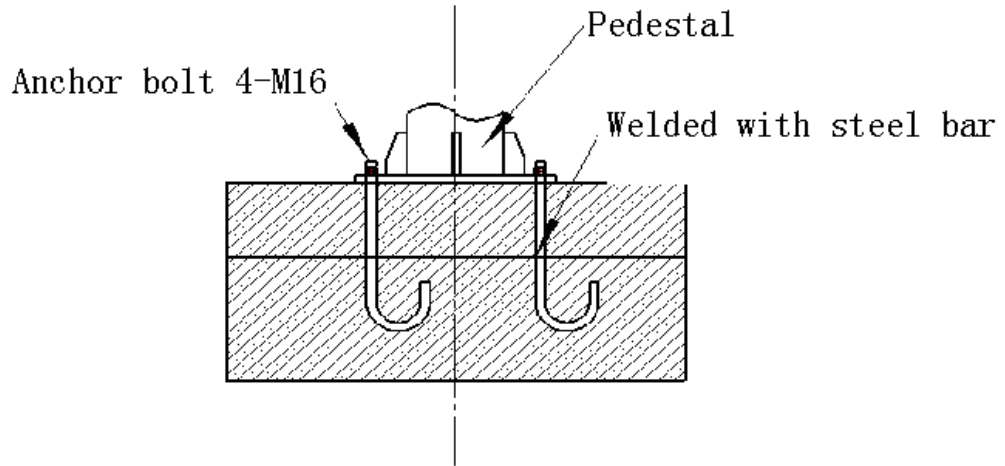


Fig.2 Fix the pedestal to Foundation

Step 2

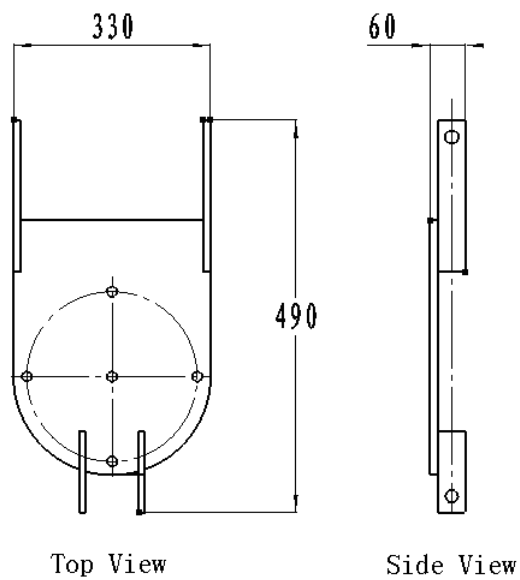


Fig.3 Sketch Of the Azimuth Turntable

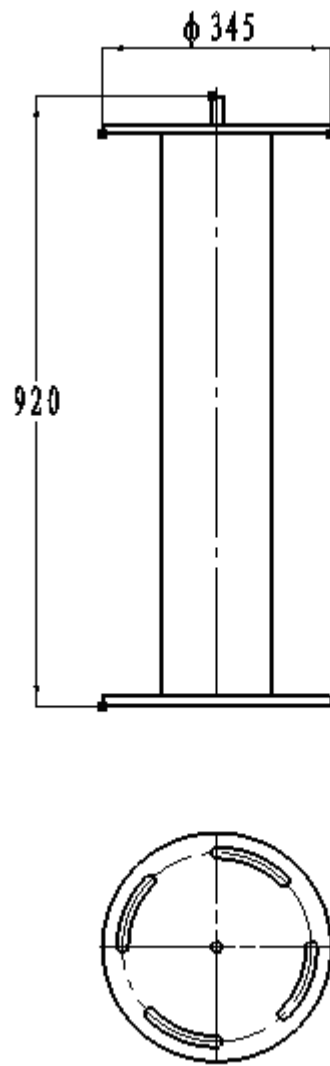


Fig.4 Sketch Of the Pedestal

Step 3

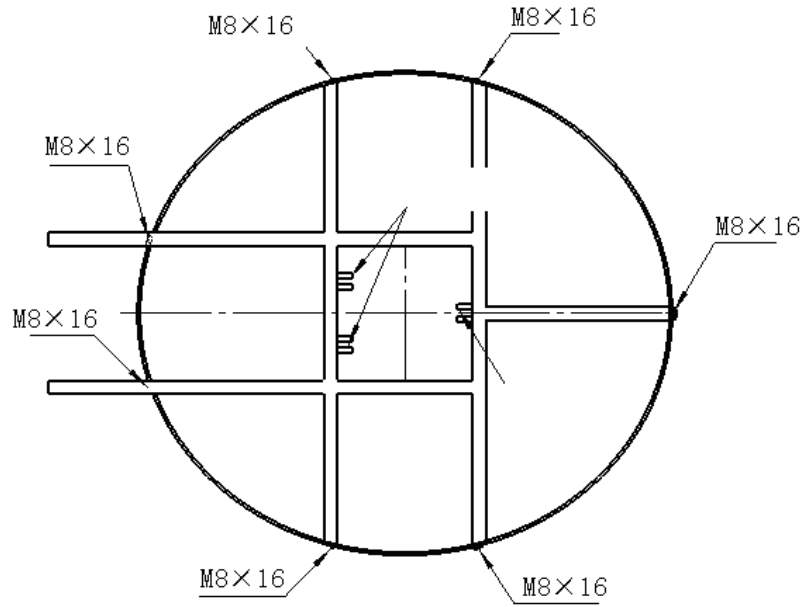


Fig.5 Assemble Reflector and Back frame

Step 4

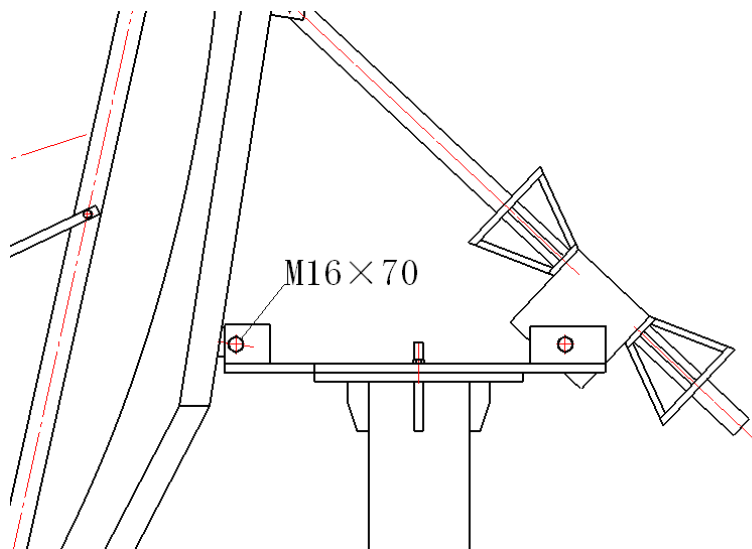


Fig.6 Assemble Reflector and Pedestal

Step 5

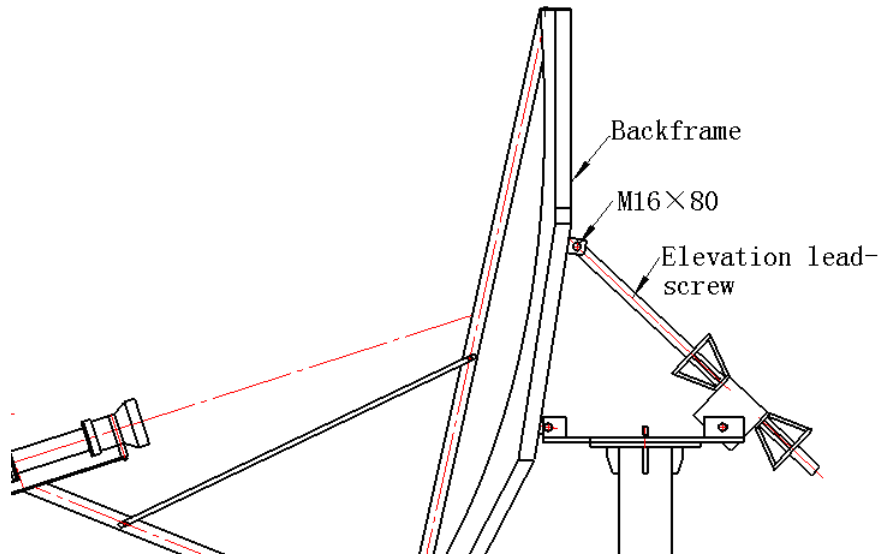


Fig.7 Install Elevation Lead Screw

Step 6

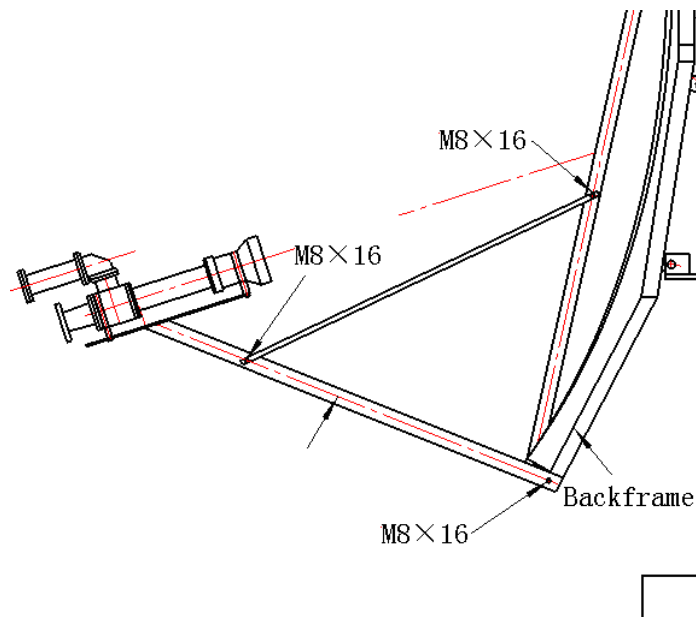


Fig.8 Install Feed Support

Step 7

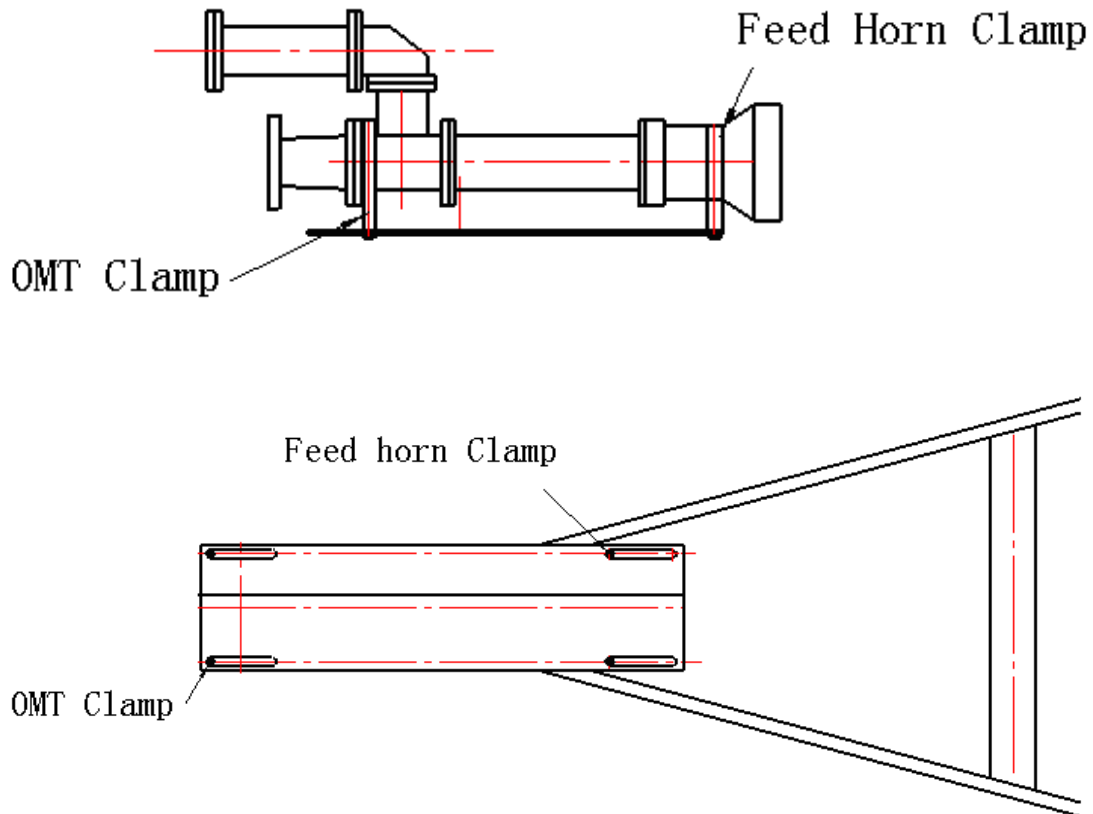


Fig.9 Install Feed Horn And OMT without circular polarizer

Please contact level421 support, in case you want to set up the antenna with Circular Polarizer in order to understand how to configure the polarizer to work with the satellite you point to correctly.

Directing adjustment

Antenna directing means aiming the beam axis of the antenna at the satellite. According to the latitudes and longitudes of the satellite and the antenna site, adjust the azimuth and elevation angles in order to receive the satellite signal. Meanwhile adjust the polarization by the following steps. First loose the flange and rotate the duplexer. When get the best reception effect, fasten the flange. Then fasten the azimuth and elevation lead screws.

Antenna elevation angle:

$$E = \arctg\left(\frac{\cos\theta \times \cos(\Phi_s - \Phi_o) - R/(R + H)}{\sqrt{1 - (\cos\theta \times \cos(\Phi_s - \Phi_o))^2}}\right)$$

Antenna azimuth angle:

$$A = 180^\circ + \arctg\left(\frac{\text{tg}(\Phi_s - \Phi_o)}{\sin \theta}\right)$$

Polarization angle:

$$P = \pm \left\{ 90^\circ - \arctg \left[\frac{\text{tg} \theta}{\sin(\Phi_s - \Phi_o)} \right] \right\}$$

$\varphi_s - \varphi_0 < 0$: P = -

$\varphi_s - \varphi_0 > 0$: P = +

Letters in the formula:

R: earth semi-diameter (6370 km)

H: satellite height (35786 km)

φ_s : east longitude of satellite earth station

θ : north latitude of satellite earth station

φ_0 : east longitude of sub-satellite point

List Of Incasement

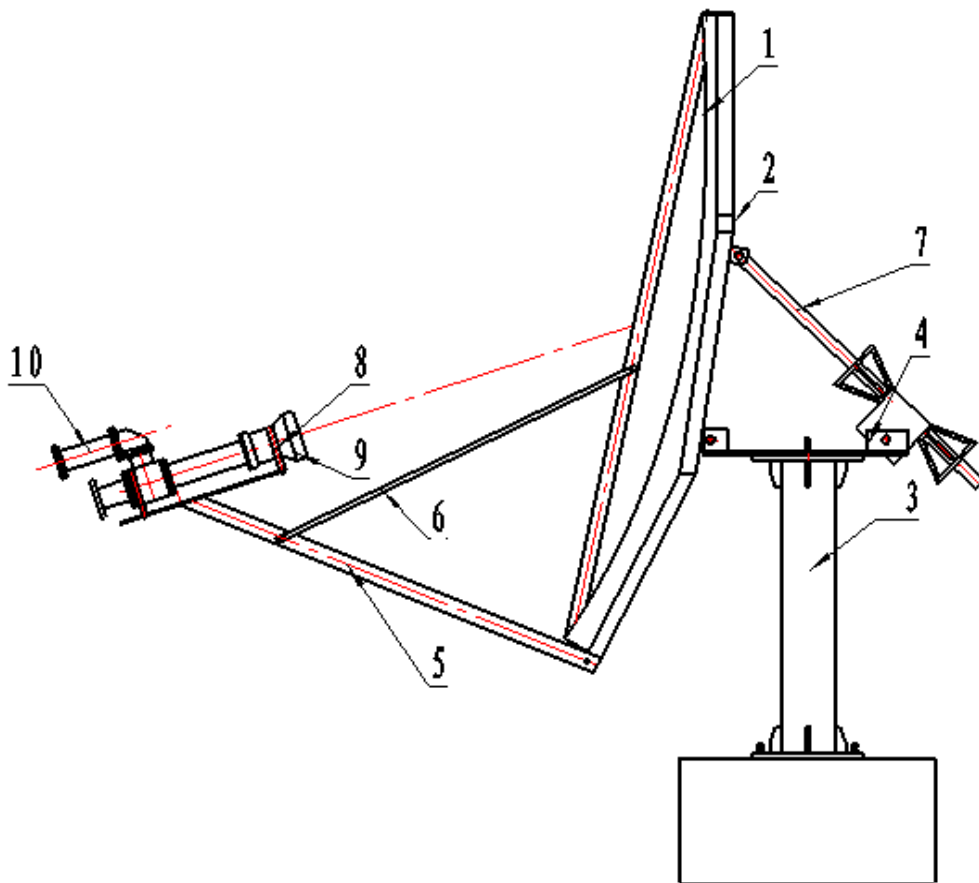


Fig.10 Overall View

Item list

<i>NO.</i>	<i>ITEM</i>	<i>AMOUNT</i>
1	1.8 m Reflector	1
2	Back frame Work	1
3	Pedestal	1
4	Base	1
5	Feed source bracket	1
6	Pull Pole	2
7	Elevation lead screw	1
8	Clamp	2
9	Horn	1
10	Phase trans	1
11	OMT	1
12	M8×16	17
13	M16×80	1
14	M16×70	3
15	M16×50	3
16	M8×55	2