

Marconi Tropospheric Scatter Aerials

As part of a comprehensive system of tropospheric scatter equipment, the Marconi Company can provide from a wide range of troposcatter aerials the type of aerial which is best suited for any specific project. Typical designs are outlined below.

The illustration below shows a 60 ft diameter dish aerial during erection and in the process of being checked to prove its surface accuracy. This dish was supplied specifically to suit a site which fell steeply away in front, necessitating the use of a horn mounted on a boom attached to the back structure. A tower can be used on flat sites, if preferred.

The illustration on the right shows a 120 ft aerial dish as it will look on final installation.

The other illustration shows a 30 ft (dia.) dish on a tripod mount with a launching height of 25 ft. Where specific sites dictate however, towers can be supplied to accept either one or two dishes for terminal or intermediate stations.

The supporting structures of these aerials are of galvanized mild steel construction with a minimum cover on the steel of 0.003 in., thus giving very good weather protection.

The surfaces of both dishes are of mild steel sheeting which is galvanized and then can be coated with p.v.c or aluminium if requested, thus giving exceptional protection against the weather. These surface sheets are supplied in a range of colours to customer's choice.

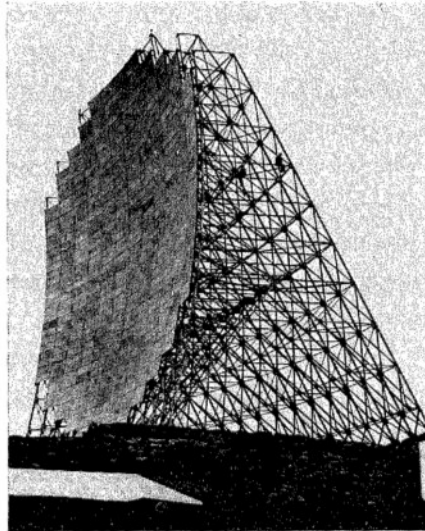
Panning

Panning is achieved by moving the horn in a horizontal or vertical direction by

Y1086

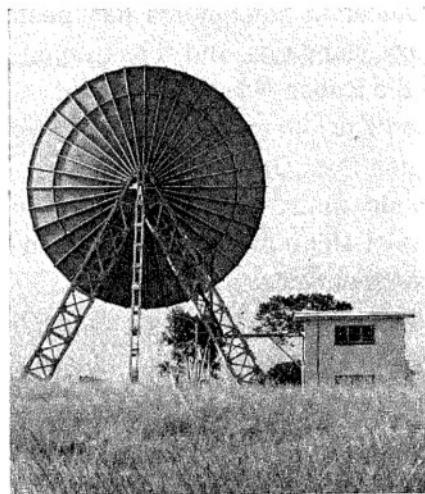


120 ft dish in course of erection



H1067

A 120 ft aerial dish



H1066

A 30 ft aerial dish

means of screw threads located in the horn mounting arrangement.

30 ft dish

$\pm 4^\circ$ panning is achieved by moving the dish itself in relation to its support structure.

Foundations

A range of foundation designs are possible, depending on local site conditions. Designs are set out with either a very accurate template or with local templates for each foot (positioned by theodolite) if required.

DATA SUMMARY

Details of reflectors:

Diameter	Focal Length	Profile
30 ft (9.3 m)	12 ft (3.66 m)	Paraboloid within 0.35 in. r.m.s of true
60 ft (18.59 m)	30 ft (9.3 m)	Paraboloid within $\frac{1}{4}$ in. r.m.s of true

Frequency normally within the range 625–1010 MHz. Higher frequencies up to 5,000 MHz can be catered for.

Panning arrangements:

60 ft dish $\pm 1^\circ$ in azimuth and altitude.
30 ft dish $\pm 4^\circ$ in azimuth and altitude.

Wind loading (max. loss –3 dB):

	Operational	Survival
60 ft dish (light version)	60 m.p.h	110 m.p.h
30 ft dish	90 m.p.h	140 m.p.h

Details of Horns and Feeders:

Primary feed. Dual polarized square section pressurized or foam-filled.

Feeders. Any suitable coaxial feeder up to $4\frac{1}{8}$ in. dia. may be accommodated as may waveguide Type WG3 (11.5 x 5.75 in. inside dimensions).

Power handling capacity: Standard designs are for use with transmitters of nominal power rating up to 10 kW. Designs for higher powers will be considered upon request.

Performance data:

	Beamwidth at –3 dB points	At frequency
30 ft dia.	$\approx 2.5^\circ$ E and H planes	950 MHz
60 ft dia.	$\approx 1.4^\circ$ E plane 1.5° H plane	755 MHz
Forward gain at 900 MHz	30 ft dia. 36 dB	60 ft dia. 41 dB

Standing-wave ratio on horns:

30 ft: better than 1.5:1 over operating band.
60 ft: better than 1.2:1 over operating band.

Side lobe levels: Will not exceed –20 dB for the first side lobe.

Polarization Isolation: At least 40 dB for 30 ft dish, 40 dB for 60 ft dish, with 50 MHz separation over 11½% bandwidth.

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