



Microwave Aerials

CONSIDERABLE PROGRESS is now being made in the utilization of the centimetric waveband for practical radio communication. The aerials employed form a particularly important feature of the radio equipment at the super-high frequencies. The large aerial gain figures available (relative to the performance of a dipole) serve to compensate in part for the high path attenuations occurring at these frequencies. The directivity of these aerials gives a high degree of discrimination against unwanted signals.

16 in. SHF Paraboloid

This compact aerial comprises a dipole radiator and dipole reflector mounted at the focal point of a lightweight spun aluminium parabolic reflector. The dipole assembly is moulded in polythene as a protection from moisture and is fed from a 75 Ω coaxial cable. This type of aerial is suitable for portable applications such as microwave radio links. For duplex working both transmitting and receiving aerials can be mounted side by side on a single support, e.g. a tripod, a metal screen serving to minimize crosstalk.

Frequency range: 4550–4840 Mc/s.

Gain: 23 dB approx.

Horizontal beam: 10°.

Vertical beam: 14°.

Main beam/side lobe ratio: Greater than 15 dB.

Back/front ratio: 30 dB.

Feeder standing-wave ratio: 1.5 approx. over the band.

4 ft SHF Paraboloid

This aerial is suitable for both portable and fixed installations. A waveguide hook feed is employed. A polythene wedge in the end of the waveguide provides electrical matching and also weather protection. The associated transmitter or receiver should be mounted directly on the paraboloid.

Frequency range: 6500–7050 Mc/s.

Gain: 36 dB at 6700 Mc/s.

Beamwidth: 3° approx.

Weight: Reflector only, 40 lb. (18.2 kg.)

6 ft SHF Paraboloid

This aerial is similar to the 4 ft paraboloid described above.

Frequency range: 6500–7050 Mc/s.

Gain: 38 dB at 6700 Mc/s.

Beamwidth: 2° approx.

Weight: Reflector only, 65 lb. (29.5 kg.)



10 ft paraboloidal aerials.

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6 ft SHF Half Dish

This aerial consists of half of a 6 ft diameter spun aluminium paraboloid, with an offset horn feed. The horn feed consists of a WG11 waveguide section flared at the end and sealed off with a polythene cover. The horn is located at the focal point. The angle of the horn, which determines the radiation pattern, is set to prevent radiation back into the feeder. By this means a good match is achieved over the whole band. A transition permits connection to a coaxial cable. In cases where a waveguide feeder is used it would be pressurized with dry nitrogen.

The aerial is normally mounted in a special angle-iron frame. These frames can be fitted side-by-side or one above the other on a supporting mast or tower.

Frequency range: 3900–4200 Mc/s.

Gain: 32 dB.

Horizontal beam angle: 4° approx.

Vertical beam angle: 6° approx.

Main beam/side lobe ratio: Better than 20 dB.

Feeder standing-wave ratio: 1.05 over the whole band.

Feeder: WG11 waveguide or coaxial cable.

Weight: Reflector only 32 lb. (14.5 kg.)

10 ft UHF/SHF Paraboloid

This aerial has been designed for use on point-to-point radio links in the 2000 or

4000 Mc/s band. It comprises a spun aluminium reflector centre-fed by a waveguide horn. The horn consists of a narrow waveguide section of special design sealed against the weather with a sheet of dielectric material. A particularly low standing-wave ratio over the band results from the design employed. The aerial is normally mounted in an angle-iron frame which may be supported on a mast or tower, and standard waveguide or coaxial cable feeders may be used. Figures in parenthesis below are for SHF version.

Frequency range: 1800–2200 (or 3800–4200) Mc/s.

Gain: 31 (39) dB approx. relative to an isotropic radiator.

Beamwidth: 4° (2°) at 3 dB down.

Main beam/side lobe ratio: 11 (20) dB approx.

Overall standing-wave ratio in waveguide feeder: 1.1 (1.07) dB approx. over the band.

Weight: Reflector with mounting 1150 lb approx. (522 kg.)

Marconi

Marconi's Wireless Telegraph Company Limited
Marconi House, Chelmsford, Essex
Telephone: Chelmsford 3221 · Telex: 1953
Telegrams: Expanse Chelmsford Telex