Passive Reflectors

PASSIVE reflector equipment can be supplied as part of the comprehensive range of mechanical engineering services for microwave communications systems. The equipment currently available consists of two distinct types.

(a) *Tower-mounting*
The passive reflector may be fixed to a tower above a ground-mounted paraboloid aerial and inclined at an angle of approximately 45°. The vertically radiated signal from the aerial is thus in a horizontal plane. Such an arrangement has the advantage of dispensing with lengthy feeder runs. This type of reflector, which is normally used with a 10 ft (3 m) paraboloid dish aerial, is approximately 14×10 ft (4·2×3 m) in size.

The reflector is panned using two screw-jacks situated between the reflector panels and support structure. This method provides two entirely separate movements in azimuth and elevation to an angle of ±5° in each plane.

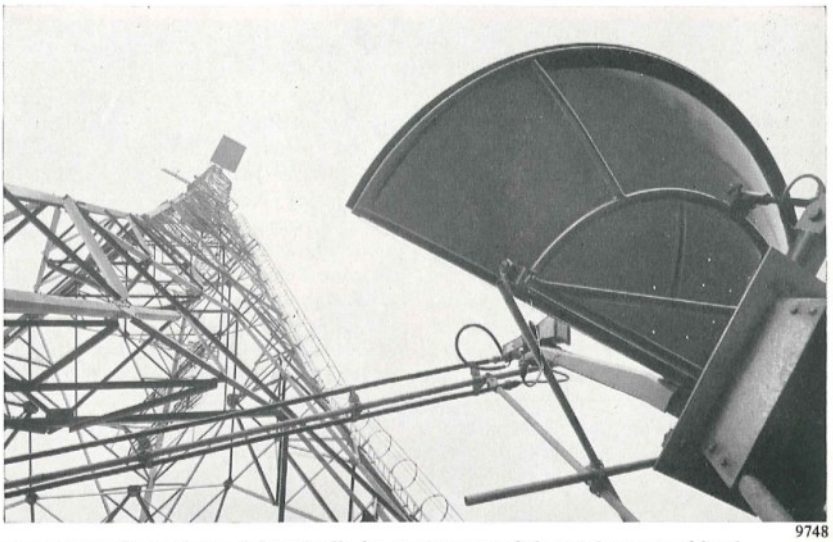
The reflecting surface is made up of unit panels bolted together, each panel being a rivetted box section of steel sheets coated with PVC. No maintenance to the surface is necessary after erection. Under operational conditions the surface accuracy is within less than 0·075 in r.m.s departure from the true profile.

Glass-fibre radomes can be supplied to enclose both the 10 ft and 15 ft aerials with passive reflectors in this type of installation.

(b) *Billboard-mounting*
In this case the passive reflector is ground-mounted and in the path of an incident radiated field. By suitably positioning the reflector, the beam is re-radiated towards a distant receiver, enabling signals to by-pass any obstructions which may be situated on the line-of-sight path between transmitter and receiver.

The Marconi Company have designs for three sizes of passive reflector, details of which are shown in the table below. Each of the reflector surfaces is made up of unit panels 10×8×1 ft (3×2·4×0·3 m). By using these unit panels and modifying the backing and support structure, the range of billboard reflectors can be extended up to a maximum of 1000 sq.ft surface area.

Reflectors of the billboard type are secured by two triangular steel frames laterally braced to counteract windloading. The supporting frames lead from the backing structure to concrete stubs set into the ground. The panning mechanism and reflecting surface are similar in design and construction to the tower-mounted type.



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A passive reflector being fed vertically by a microwave dish aerial at ground level.

WIND SPEED

Type	*Size (ft)*	*Operational*	*Survival*	*Ice loading*	*Snow loading*
J 0401	10×14	70 mile/h	150 mile/h	½ in. (1·3 cm)	12 in. (30 cm)
J 0421	20×16	70 mile/h	150 mile/h	½ in. (1·3 cm)	12 in. (30 cm)
J 0420	24×20	70 mile/h	150 mile/h	½ in. (1·3 cm)	12 in. (30 cm)
J 0422	10×24	70 mile/h	150 mile/h	½ in. (1·3 cm)	12 in. (30 cm)

The snow loading is for 12 in. (30 cm) on the horizontal and sloping surfaces of the tower-mounted reflector. A combination of both is acceptable provided the total weight does not exceed 800 lb (360 kg).

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