Static Surveillance Aerials

Polarization:
10cm (S) Band: Fixed, horizontal or circular.
23cm (L) Band: Fixed or horizontal.

Gain:
10cm (S) Band cosec²: 34dB.
10cm (S) Band parabolic: 37dB.
23cm (L) Band cosec²: 28dB.

Aerial turning speeds: 6 to 15 r.p.m dependant on drive assembly.

Drive motor: 4·5 h.p.

Operating temperature: −30° to +50°C.

Storage temperature: −40 to +65°C.

Operational wind speed: Gusting to 130 k.p.h (70 knots) without tethering.

Survival wind speed: Gusting to 222 k.p.h (120 knots) with tethering and aerial folded.

Ice coating: 6·3mm (0·25in.) maximum.

Maximum ground bearing pressure (deployed): 196·6kg per cm² (2800lb/ft²).
All fixings and materials are adequately protected against environmental corrosion and the aerial equipment will operate in all climatic conditions.

Full details are given in Marconi Radar Data Sheets A1—10cm (S) Band; A2—23cm (L) Band.

There are four basic S600 static surveillance aerials:

Type S1011 using a single curvature 13·72×4·57m (45×15ft) parabolic reflector for 10cm (S) Band.

Type S1012 using a single curvature 13·72×4·57m (45×15ft) cosec² reflector for 10cm (S) Band.

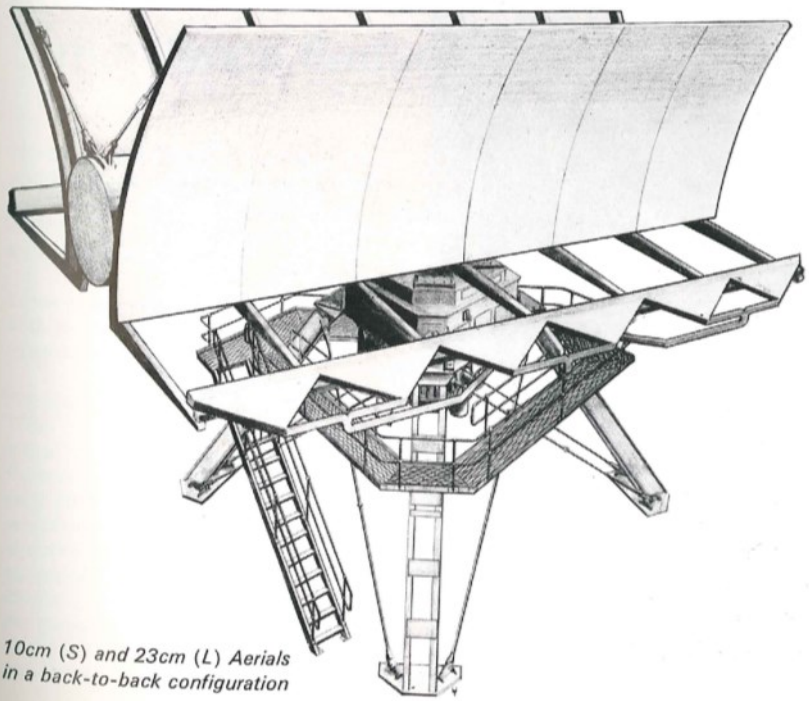
Type S1013 using a single curvature 13·72×4·57m (45×15ft) parabolic reflector for 23cm (L) Band.
Type S1014 using a single curvature 13·72×4·57m (45×15ft) cosec² reflector for 23cm (L) Band.

These aerials can be used singly or in back-to-back configurations. The back-to-back aerials provide a choice of a 10cm (S) Band parabolic or cosec² reflector mounted back-to-back with a 23cm (L) Band parabolic or cosec² reflector on a single turning gear.

All of these aerials are suitable for all static installations and can be mounted on a gantry, plinth or building roof. The reflectors are illuminated with linear feeds and all except the 23cm (L) Band parabolic reflector can be illuminated by a new squintless 'delta' feed. This squintless feed permits diversity operation to be undertaken by using a new Marconi multiplexer whereby several transmitters can be operated simultaneously into a single aerial. The squintless feed also enables a radiation pattern to be achieved with sidelobes better than 28dB down on the main beam.

Provision has been made for the attachment of secondary radar (IFF) aerials to all of the reflectors.

The 10cm (S) Band aerials are used with either the 1MW (S2010) or 2MW (S2012) 10cm (S) Band Transmitter/Receivers which are described on page 260. The 23cm (L) Band aerials are used with the 2MW 23cm (L) Band Transmitter/Receiver described on page 260.



10cm (S) and 23cm (L) Aerials in a back-to-back configuration

Features

Squintless Linear Feeds.

High Gain.

Diversity operation over wide frequency band.

Excellent Sidelobe Performance.

Data summary

Reflector size: 13·72m×4·57m (45×15ft).

Horizontal beamwidth:
10cm (S) Band cosec²: } 0·55° at half power points
10cm (S) Band parabolic: }
23cm (L) Band cosec²: } 1·24° at half power points
23cm (L) Band parabolic: }

Vertical coverage (cosec² aerials): cosec squared up to 40°.

Vertical beamwidth (parabolic aerials): 1·5°.

Sidelobe level (horizontal): Better than 28dB.

Bandwidth:
10cm (S) Band: 400MHz.
23cm (L) Band: 120MHz.

Aerial gain:
10cm (S) Band: 45dB.
23cm (L) Band: 34·25dB.

Polarization: Horizontal.

Aerial turning speeds: 3, 4, 6 and 8 r.p.m dependant on drive arrangement.

Drive motors: Up to 3, one- or two-speed electric motors each of 35 h.p nominal rating.

Performance in wind: Normal operation in windspeeds up to 60 knots; (111 k.p.h).
6 r.p.m at 80 knots (148 k.p.h). Will withstand 120 knots (222 k.p.h) without damage or permanent deflection.

Ice loading: 2lb/ft² in 70 knots (130 k.p.h).

Full details are given in Marconi Radar Data Sheets A4 (S) Band A5 (L) Band A6 (back-to-back)

Transportable/Static Heightfinder Aerial

The basic S600 transportable/static heightfinder aerial is the Type S1017 which has a 4·27×1·3m (14×4·25ft) double-curvature reflector and operates in the 5·5cm (C) Band. A horn feed is used to permit frequency diversity operation.

The aerial is normally supplied as a self-contained aerial vehicle which can be lifted by helicopter, carried in transport aircraft or towed by a light vehicle such as a landrover. It can also be supplied in static form for mounting on a gantry, tripod or building roof.

Lightweight construction permits exceptional mechanical agility giving a height data rate of some 17 random heights per minute increasing to 22 by programmed control of azimuth and elevation drive motors. Reflector elevation angles from −5 to +55° are obtainable at velocities of up to 45°/sec. Azication is achieved by a thyristor controlled 4·5 h.p d.c motor and precision servo system. A velodyne mode is available for continuous rotation, up to 18 r.p.m, for emergency volumetric scanning with a 'look back' interrupt facility for spot heights. Accurate data take off is assured by the use of a 'built-in' Vertical Reference Unit.

A standard tripod mount is used which folds readily for transportation. A standard set of running gear, consisting of road wheels and suspension, can be rapidly attached to the aerial assembly. The reflector and horn feed folds down to the horizontal position for transportation.

This aerial is used with the 1MW 5·5cm (C) Band Transmitter/Receiver Type S2013 described on page 260.

Features

Fully transportable.

Simple 'nodding' mode or computer controlled for automatic operation with Height Extraction for up to 22 heights per minute.

Excellent sidelobe performance.

Data summary

Reflector size: 4·27m×1·3m (14×4·25 ft).

Horizontal beamwidth: 3·0°.

Vertical beamwidth: 0·9°.

Sidelobe levels: 25dB down on main beam.

The 5·5cm (C) Band heightfinder aerial

Polarization: Circular.

Operating temperature: −30 to +50°C.

Storage temperature: −40 to +65°C.

Operational wind speed: Gusting to 70 knots without tethering.

Survival wind speed: Gusting to 120 knots with tethering.

Ice coating: 6·3mm (0·25 in.) maximum.

Maximum ground bearing pressure (deployed): 196·6kg per cm² (2800lb/ft²).

All fixings and materials are adequately protected against environmental corrosion and the aerial equipment will operate in all climatic conditions.

Full details are given in Marconi Radar Data Sheet A3.