



50 cm Airfield Control Radar

Types S 232 and S 232/1

THESE multi-purpose surveillance radar sets, which are designed to meet both civil and military needs, achieve to a very high degree the paramount requirement of an airfield control radar – dependability. Their characteristics are such that they can be used simultaneously for long-range surveillance and for close control of aircraft within the airport terminal area. This capability renders them particularly attractive for use at busy air terminals handling jet aircraft. In such applications a considerable saving in skilled manpower and in both initial and operating costs is achieved, as all radar requirements for the airport (except Precision Approach Radar) are met by one equipment.

The difference between Types S 232 and S 232/1 is in relation to the aerial rotation gear.

FEATURES

Completely crystal-controlled.

Particularly efficient moving target indicator (MTI) system of permanent echo suppression.

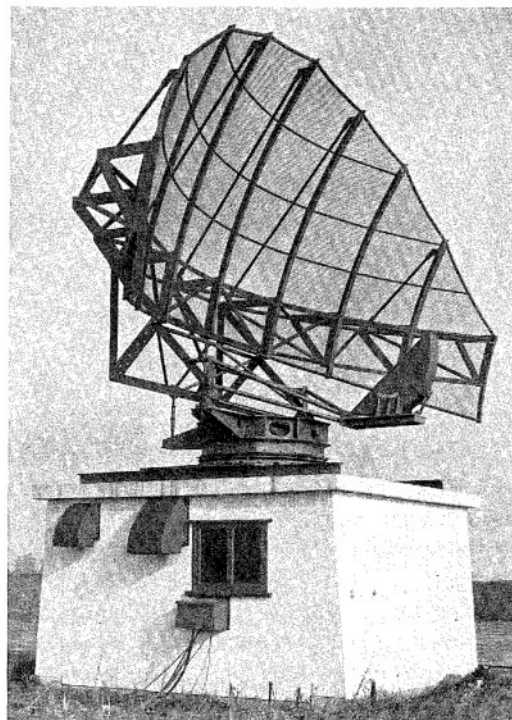
Absence of *all* weather effects due to employment of 50 cm wavelength. No additional circuits or polarisers are necessary.

Fully efficient immediately upon switching on – even after long periods of inactivity.

Maintenance facilities particularly emphasised in the design.

Inter-services type-approved components used throughout.

Suitable for use in all types of climatic conditions.



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EQUIPMENT

The equipment can be divided into two main sections, the apparatus situated at the aerial head and that in the operations building. The former comprises the aerial assembly, mounted on the roof of a concrete building containing the transmitter, the receiver and the automatic transmit/receive switch, as well as the aerial turning gear and associated equipment.

A horn-fed parabolic reflector is employed, the horn being energised by a wide-band probe to

which the coaxial feeder is connected. The whole aerial assembly can be tilted vertically between -1° and $+10^\circ$ relative to the horizontal.

Type S 232 employs an amplidyne-controlled servo system for aerial rotation. This ensures constant rotation speed under varying wind conditions and provides continuous speed variation from $\frac{1}{2}$ to 10 r.p.m.

Type S 232/1 employs a simple two-speed aerial drive system providing rotation at $7\frac{1}{2}$ or 15 r.p.m. This system, which incurs less capital cost, is normally suitable for civil aviation purposes.

The operations building, which may be the control tower, houses the display equipment and ancillary apparatus. The radar signals from the aerial head, both cancelled and uncanceled, are passed to a radar distribution unit, where locally-

generated calibration marks are added, and the composite video signals are then fed to the display units which can select either cancelled or uncanceled channels as required. The Type SD 701 display, described on page 535, is used. Up to eight can be operated from one aerial head. The displays may be separated from the aerial head up to a distance of 400 yards (370 metres). By the use of additional amplifiers, this distance can be increased to 5000 yards. Further increase of distance can be achieved using the Radar Link Equipment (see page 547).

The aerial head equipment is entirely controlled from the display site, including aerial starting and speed control.

Power supply generators can be provided where mains supplies are inaccessible or for emergency use in the event of mains failures.

DATA SUMMARY

Radio frequency: 500–610 Mc/s crystal controlled.
(operation on any one of 11 spot frequencies).

Peak power output: 50–60 kW.*

Pulse recurrence frequency: 500–800 p.p.s. (nominal) crystal controlled.

Pulse length: 2 or 4 μ s.

Receiver noise factor: 8–10 dB approx.

Permanent echo suppression (static): At least 46 dB at max. range of equipment.

Sub-clutter visibility: 39 dB at 6 r.p.m. and 800 p.p.s.

Aerial system:

Horizontal beamwidth: $3\frac{1}{2}^\circ$ – 4° at 3 dB down.
Vertical beamwidth: 20° approx. (dependent on site).

Polarisation: Horizontal.

Side lobes: 26 dB down on main lobe amplitude.

Back-to-front ratio: 40 dB approx.

Rotation: S 232: Continuously variable from $\frac{1}{2}$ to 10 r.p.m.

S 232/1: $7\frac{1}{2}$ to 15 r.p.m.

Displays: PPI Display Type SD 701 (see page 535).

Up to 8 can be used.

Power supplies:

Aerial: 230 V or 400 V ($\pm 6\%$) 3-phase 50 c/s ($\pm 5\%$) AC.

Radar Equipment: 230 V ($\pm 6\%$) single phase 50 c/s ($\pm 5\%$) AC.

Power consumption: 13 kVA approx.

Dimensions:

	Height	Width	Depth
<i>Transmitter</i>	5 ft 4 in. (162 cm)	2 ft 6 in. (77 cm)	2 ft 6 in. (77 cm)
<i>Receiver</i>	6 ft 3 in. (191 cm)	2 ft (60 cm)	2 ft (60 cm)
<i>Display unit</i>	3 ft 6 $\frac{1}{2}$ in. (108 cm)	2 ft 1 in. (63 cm)	3 ft 4 in. (102 cm)
<i>Distribution unit</i>	6 ft 3 in. (191 cm)	2 ft 3 in. (69 cm)	2 ft 3 in. (69 cm)

Aerial system

Length of reflector: 29 ft (9 m).

Height of reflector: 10 ft (300 cm).

Focal distance: 8 ft (250 cm).

Overall width: 12 ft (370 cm).

Overall height (less pivot mount): 15 ft 3 in. (465 cm).

Depth of pivot mount: 4 ft 6 in. (137 cm).

*An amplifier unit can be supplied to raise the output to over 400 kW.

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