Bandwidth: 15MHz (nom.).

Receiver (I.F and Video): Linear and logarithmic i.f amplifiers are included. PLD processing is applied to log video.

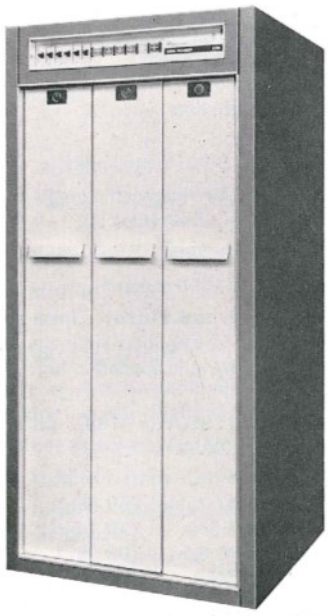
I.F output: 45MHz.

Power input: 380V or 415V 3-phase 50–60Hz. 8kVA.

Dimensions:

Height	167·75cm	(5ft 6in.)
Depth	64·8cm	(2ft 1·5in.)
Width	190·6cm	(6ft 3in.)
Weight	800kg	(1750lb)

Full details are given in Marconi Radar Data Sheets B1, B2, B3 and B4



Signal Processing System Type S7005

S600 Series Signal Processing Systems

A standard modular signal processing system, Type S7005, has been designed to operate with any of the four S600 Transmitter/Receivers (described on page 260). Another version, the S7006, (S7008 where Secondary Radar Trigger is required), has been designed for use with fully coherent radars such as the S650 and S670 described on page 257 and 258.

The signal processing systems are based on a double-cancellation MTI (moving target indication) system with a choice of additional facilities such as PRF Stagger and PRF Discrimination. The system is all solid-state and contained on three drawers in a cabinet only 1·67m (5ft 6in.) high and requiring only 0·46m² (5ft²) of floor space.

Features

Autonomous system requiring only 45MHz i.f input.

Choice of system parameters.

Double-cancellation MTI.

PRF Stagger.

PRF Discrimination.

All solid-state.

Data summary

PRF: 250 to 600 p.p.s by choice of quartz delay line.

Signal input: i.f at 45MHz.

MTI: Double cancellation.

Cancellation ratio (of canceller): 50dB.

Static clutter suppression: 40dB.

Overall dynamic cancellation ratio: typically 34dB.

Processing facilities:
PRF Stagger.
PRF Discrimination.
Log/Pulse Length Discrimination.

Signal outputs:
Primary Radar Trigger.
Secondary Radar Trigger (S7008).
Display Trigger (3).
Log/PLD video.
MTI Video.
MTI Gated Video.

Power input: 220 or 240V ±10%, 45–65Hz. 300VA approx.

Dimensions:

Height:	167·75cm	(5ft 6in.)
Width	68·58cm	(2ft. 3in.)
Depth	64·8cm	(2ft 1·5in.)
Weight	163·4kg	(360lb)

Full details are given in Marconi Radar Data Sheet B5 (S7005) and B6 (S7006)

Fixed-coil Radar Displays

The S3000 series is a family of fixed-coil displays which are used in conjunction with a modular back-up system equipped with facilities to meet individual system requirements. This series has been designed to cater for all operational requirements ranging from simple single radar displays to complex multiple synthetic display systems.

There are six basic display units in the S3000 series:
S3001, S3002 } 12in. high-definition fluoride display units.
S3008, S3009 } 16in high-definition fluoride display units.
S3013 16in. high-definition single-coil fluoride display unit.
S3006 11in. bright display unit for daylight viewing.

All the display units are fully transistorized with solid-state circuitry mounted on plug-in printed circuit cards. They are built as compact units containing a cathode ray tube, its e.h.t supplies, deflection coil assembly, deflection amplifiers, video amplifier, all appropriate controls and a cooling fan. Power supplies, operating from a mains supply are contained in a separate unit which

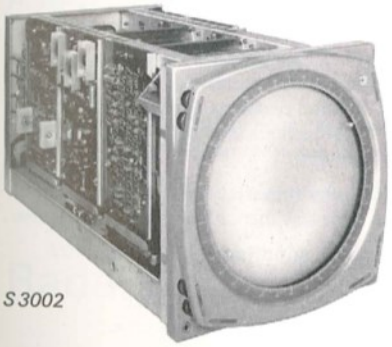
may be clamped to the bottom of the display unit or located up to 30·5m (100ft) away. The displays may be supplied as self-contained units for mounting in a console framework or housed in table mounts for autonomous use. Video inputs may include multiple primary videos, range marks, video map, secondary radar video and symbols for track labelling and inter-console or other markers.

Associated with the display units is a range of ancillary equipment for producing deflection waveforms, range marks, alphanumeric characters, etc. Each facility is constructed from standard printed circuit cards and these are mounted in standard cabinets enabling systems to be built to meet individual requirements.

S 3001

This unit is a fully comprehensive, flexible display unit with facilities for displaying raw radar information with superimposed alpha-numeric characters for track labelling and height indicators.

Alternatively it may be used as a purely synthetic display in a computer controlled environment.



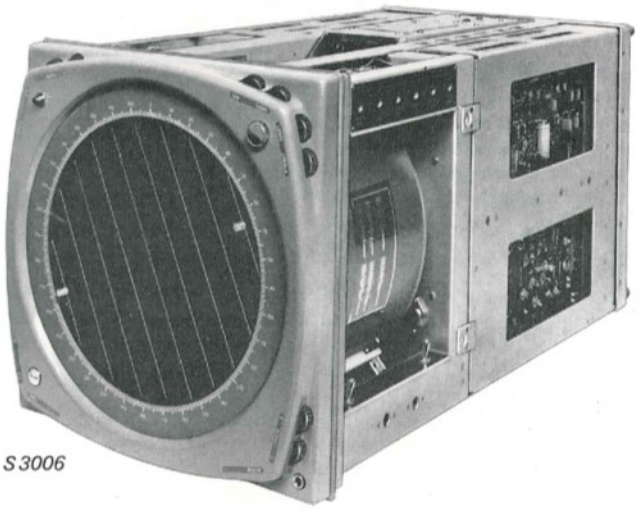
S 3002

S 3002

This unit has more limited inputs for use where the full facilities of the S 3001 are not required. However it has an exceptionally small spot size which enables small characters to be written with great clarity. It is a 'minimum' unit with certain facilities removed to the central equipment viz. range expansion, off-centring and re-centring. In addition, some video inputs are combined as alteratives making the unit particularly suitable for synthetic applications.

S 3008

This unit provides the same facilities as the S 3002 but has a 16in. screen and is fully ruggedized. It is electrically interchangeable with the S 3002.



S 3006

S 3009

This unit provides the same facilities as the S 3001 but has a 16in. screen and is fully ruggedized. It is electrically interchangeable with the S 3001.

S 3013

This unit is a single coil version of the S 3009 providing very high speed character writing facilities. The single coil system removes aperture limitations and improves the definition of symbol information. The deflection time is 30μsec with a rise time better than 50nsec and the character writing time is 5μsec.

S 3006

This display incorporates a direct view storage tube (DVST) which produces a picture up to 1000 times brighter than a fluoride tube.

The display may be used in any ambient lighting with consequent improvement of operational environment.

The DVST has two electron guns mounted coaxially for minimum distortion and uniform illumination. One gun writes the display as a charge pattern on a metallic storage surface using high velocity electrons. This mesh is flood illuminated with low velocity electrons by the second gun. Where a pattern has been written, these electrons are accelerated through the mesh in parallel streams to continuously energize a high output phosphor on the tube face. The effect of after glow can be produced by varying the storage characteristics and instant erasure is possible.

The S 3006 is electrically and mechanically interchangeable with the S 3001, but does not afford inter-trace marking facilities.

Facilities and Functions

Range and Expansion: the display will accept maximum timebase ranges between 40 and 320nm (74 and 590km). These may be expanded in four steps in the ratios 8:4:2:1, giving minimum ranges of 5 and 40nm (9 and 74km approx.). Expansion occurs about the tube centre, not timebase origin.

Off-centring: up to the maximum range of the timebase. Automatic re-centring is available for relocating the timebase origin.

Input Selection: for single head data and associated auxiliary data, selection facilities are built into the display system. For multiple head operation a separate head selection unit is available.

Inter-trace Marking: symbols or alphanumeric characters may be displayed independently of the radar data,

S 3009

but still influenced by expansion and off-centring. Character size is unchanged by expansion.

Range Marks: various scales of coarse and fine marks e.g I nautical mile with highlighted 5 nautical mile, or 10 nautical mile with highlighted 50 nautical mile. Metric calibration also available.

Video Map: a separate video map input is provided (except on S3002 and S3008) so that the map information may be displayed either with or without the other data.

Tracker Ball: unlimited control of marker positions using either analogue or digital data.

Head Combining: alternated display of video from combined head radar over 180° sector.

Integrated Display: alternate display of video from combined head radar on alternate scans.

Video Range Strobe: continuously variable ring strobe with calibrated control.

Vector Line Marker: usable for bearing strobe with calibrated control; DF bearing indication; flight path prediction.

Full details of these display units are given in Marconi Radar Data Sheets: E1 (S3001) E2(S3002) E3(S3008) E4(S3009) E6(S3006) E8(S3013)

11in. S3006 Direct View Storage Tube Display in operation at Ostend Airport

Distance-from-Threshold Indicator

Using 12·7cm (5in.) Bright Display Type S3004

The role of distance-from-threshold indicator (DFTI) is just one of the many applications of the Marconi Bright Display Type S3004, which uses the 12·7cm (5in.) direct-view storage tube. Its great advantage over all conventional PPI displays is that it may be used under all lighting conditions and does not need to be operated in a darkened room.

In this particular application the display may be used in a control tower to monitor current air-traffic patterns in the vicinity of an aerodrome without reference to a third party. The controller may select (a) the approach path to the runway in use, from 10 miles out to the point of touchdown (b) the area from the take-off end of the runway in use out to a distance of 10 miles, or (c) the normal PPI picture, centred on the aerodrome, out to a distance variable between 10 and 20 miles radius. This last position will give a picture of all aircraft within the general circuit pattern of the aerodrome while the first two positions enable a more detailed observation to be made of aircraft, on the final approach to land, or immediately after take-off.

The display unit has been kept to the minimum size, using the most advanced semiconductor and printed-circuit techniques so that as little of the valuable space in the control tower as possible is used.

Features

12·7cm (5in) high-brightness direct-view storage tube.

Semiconductors and printed circuits extensively used.

Small size.

Low heat dissipation—convection cooling.

Plug-in printed circuit boards for ease of maintenance.

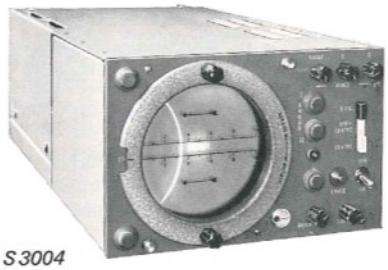
Long periods possible between routine maintenance checks.

Capable of integration with any surveillance radar systems.

Immediate push-button erasure of picture.

Automatic erasure when new viewing area selected.

Visual indication of runway threshold selected or off-centred picture.



S3004

Data summary

Inputs: Separate inputs for each of two radar systems each comprising:
(i) Video. Up to 3 channels.
(ii) Sync. pulses.
(iii) Turning information.

Screen luminance: Up to 1000ft-lamberts.

Display ranges:
(i) Off-centred positions 10 nautical miles per tube diameter.
(ii) Centre position 10–20 nautical miles per tube radius, centred on the aerodrome.

Display off-centring: Up to six off-centred positions corresponding to approach areas at each end of three runways.

Display linearity: Maximum positional error less than 2·5% of display diameter.

Power supplies: 200, 220 or 240V ±(10%).
45–65Hz, single-phase a.c.
Consumption 350W approx.

Ambient temperature range: 0 to 45°C.
Variation without adjustment of controls, 10°C.

Dimensions:

Viewing unit

Height	14·3cm	(5⅝in.)
Width	22·5cm	(8in.)
Depth	43·2cm	(17in.)
Weight	9·1kg	(20lb)

Power and waveform unit

Height	84cm	(2ft 9in.)
Width	56cm	(1ft 10in.)
Depth	38cm	(1ft 3in.)
Weight	54·5kg	(120lb)

Full details are given in Marconi Radar Data Sheet E5.