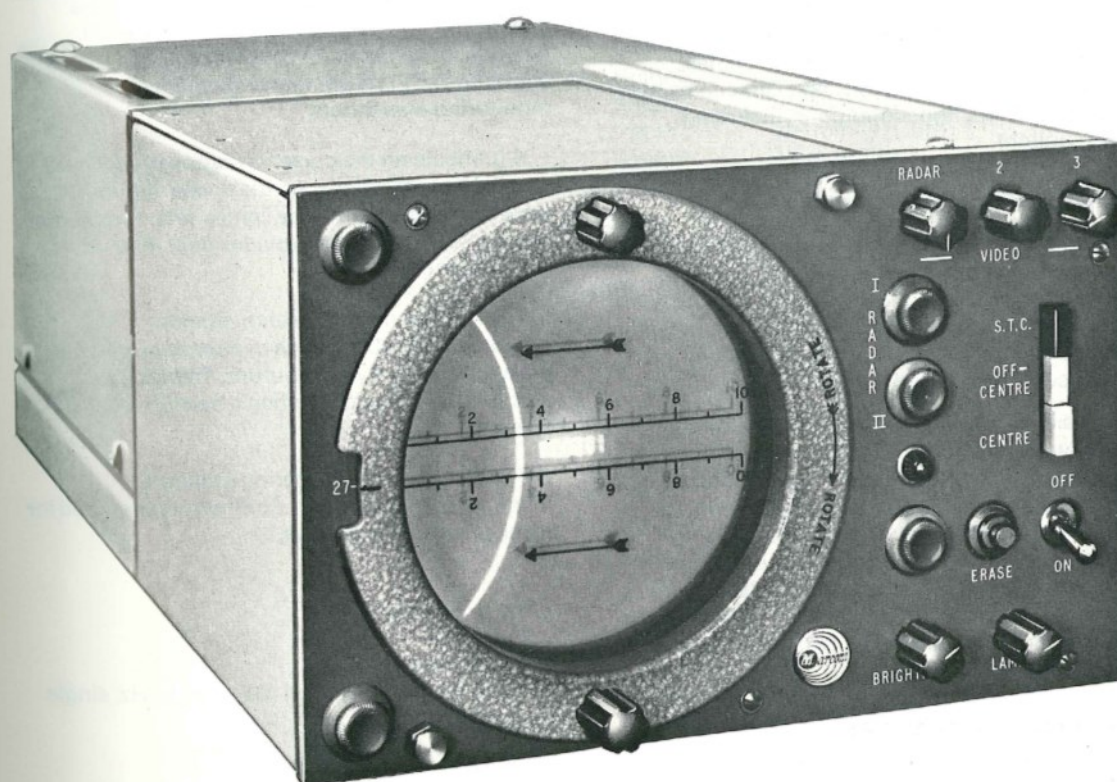


# Marconi Radar Data Sheet F5

## Distance-from-threshold Indicator-Display Unit Type S3004



Capable of integration with any surveillance radar system

Visual indication of runway threshold selected or off-centred picture

Immediate push-button erasure of picture

The limit on the number of aircraft movements in and out of an airport is due very often to the utilization rate of the runways. This, in turn, is governed by the ability of the aerodrome controller to judge when outbound aircraft can be released safely for take-off between successive aircraft on landing approach. Achieving an efficient traffic flow demands a reasonably accurate knowledge of the position of aircraft on the approach path and in particular their distance from the runway threshold. This information is provided by the Display Unit Type S3004, which is a special-purpose compact radar display designed specifically as a distance-from-threshold indicator (DFTI).

Previous attempts to provide radar displays for use by aerodrome controllers in the cabs of control towers have been unsatisfactory because of the high ambient light level within the glass-walled cab, and the low brightness of conventional radar display cathode-ray tubes.

In order to overcome this problem, the DFTI uses a direct view storage tube (DVST) which provides a picture several hundreds of times brighter than the ordinary display. This can be read under all ambient light conditions, including direct sunlight.

## Mechanical Features

The equipment comprises a viewing unit and an analogue drive unit. The viewing unit consists of an aluminium alloy chassis and cover, which contains the cathode-ray tube and its high voltage supplies and may be either fitted into a standard control console or stood on a desk surface.

It measures 143mm (5½in) high by 225mm (8¾in) wide by 432mm (1ft 5in) deep and weighs 9kg (20lb). The analogue unit consists of an aluminium cabinet, housing plug-in printed circuit boards in 32-way edge-connectors, a control panel, low-voltage power supplies and a blower unit. It measures 864mm (2ft 10in) high by 558mm (1ft 10in) wide by 381mm (1ft 3in) deep and weighs 41kg (90lb). The two units may be separated by up to 92m (300ft).

## Electrical Features

### Direct View Storage Tube (DVST)

The direct view storage tube has two electron guns mounted coaxially for minimum distortion and uniform illumination. One gun writes the display as a charge pattern on a metallic mesh 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 continuously to energize a high output phosphor on the tube face. The effect of afterglow can be produced by varying the storage characteristics and instant erasure is possible.

### Deflection System:

The equipment accepts turning data, with

synchronization pulses, from each of two radar systems, and generates the necessary timebase and bright-up waveforms.

### Video System:

The equipment accepts up to three channels from each of two radar systems. All are similar in characteristics and accept radar, video map or external range-ring video. An STC circuit may be switched in to the radar input.

## Operational Features

Up to six off-centre positions may be set into the system, in order to represent alternate ends of three runways. These are selected by a rotating cursor surrounding the tube face and fitted with click-stops. In this way, the threshold of each runway appears at the zero range point on the display regardless of the actual geographical position of the radar. A switch is provided to give a short range PPI presentation, useful for monitoring overshoots.

A graticule on the cursor is engraved with two parallel lines marked at nautical mile intervals, which bracket the runway centre-line. An internal range marks generator provides two-mile calibration range rings.

The display, normally set to provide approximately 30 seconds of afterglow, can be erased instantly by pushbutton. This facility automatically operates when a new off-centre is selected.

The front panel and bearing scale are illuminated for night use. Controls are provided for video level and brightness.

## Data Summary

### Power input:

200V or 220V or 240V  $\pm 10\%$ , 45 to 65Hz, single phase 350VA.

### Useful screen size:

102 mm (4in).

### Brightness:

300 to 500 foot lamberts.

### Deflection system

*Sync:*

**Level:**

positive going pulse 5V to 50V.

**Impedance:**

50 to 100  $\Omega$

*Azimuth:*

sin and cos analogue voltages.

**Level:**

$\pm 10V$  or  $\pm 50V$  peak.

**Impedance:**

100K $\Omega$



**Range scale****Off-centred:**

10 nautical miles (18.5km) to the diameter.

**Centred:**

10 to 20 nautical miles (18.5 to 37km).

**Linearity:**

2½% of the diameter.

**Video system:**

3 channels, one with STC, for each of two heads.

**Level:**

positive going from earth, 1V to 6V peak.

**Impedance:**

50 to 100Ω.

**Limiting signal/noise ratio:**

not less than 3:1

**Minimum pulse length:**

0.5 μs.

**STC:**

5 μs.

**Environment****Temperature:**

Operational: 0 to +45°C.

Adjustment unnecessary over  
±10°C range.

Survival: -30°C to +65°C.

**Relative Humidity:**

Operational: 95% at 25°C.

Survival: 95% at 40°C.

**Pressure:**

Operational: 750mb.

Survival: 420mb.

**Dimensions****Viewing unit:**

Height: 143mm (5½in).

Width: 225mm (8¾in).

Depth: 432mm (1ft 5in).

Weight: 9kg (20lb).

**Drive unit:**

Height: 864mm (2ft 10in).

Width: 558mm (1ft 10in).

Depth: 381mm (1ft 3in).

Weight: 41kg (90lb).

The information given herein is subject to confirmation at the time of ordering.

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