Marconi
Radar Systems

S700 SERIES
LOW LEVEL radar systems

700 series LOW LEVEL radar systems

The Marconi series of low-level radar systems has been introduced to provide a total capability in low-level and gap-filler applications. The systems incorporate the benefits gained from over 30 years of experience in all aspects of radar system development, manufacture, installation and in-service support.

The standardised electronics modules, comprising the transmitter-receivers, signal processors and display and data handling systems, have been designed to meet the technical aspects inherent in the specialised operational requirements, the antennas, software and deployment features being configured to fulfil each specific operational role.

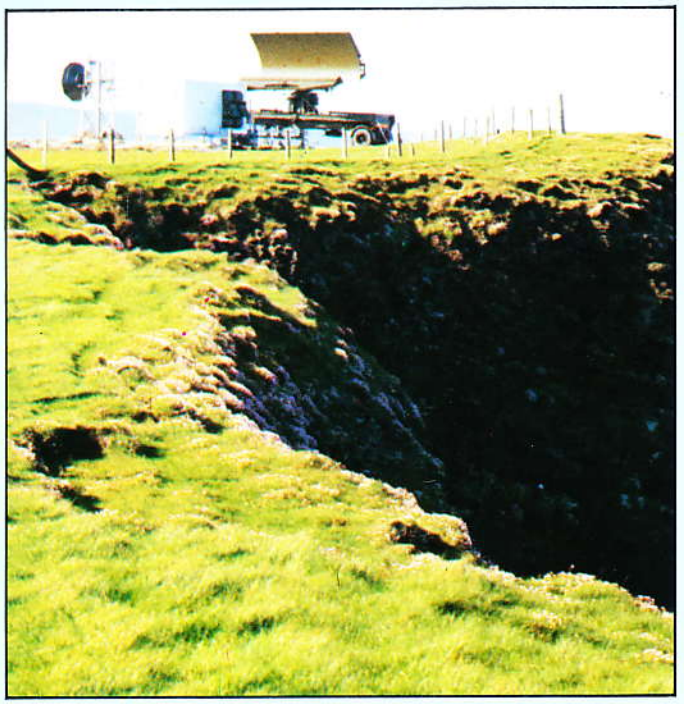
The series at present comprises three systems, the S706 tactical/coastwatching radar, the S711 tactical 'pop-up' radar, for forested and mountainous applications, and the S712 tactical/point defence radar.

The standardised electronics modules provide the following features:

- ★ 10cm S-band (NATO E/F-band) operation.
- ★ High stability coherent (driven) transmitter and matching receiver with optimised pulse compression.
- ★ Cathode modulated TWT using fail-soft switching modules.
- ★ Wideband frequency agility and PRF stagger with multiple operating modes.
- ★ Adaptive signal processing.
- ★ Integrated secondary (IFF) system.
- ★ Integrated primary and secondary plot extraction.
- ★ Dual operator's positions with automatic data processing.
- ★ State-of-the-art solid-state electronics.
- ★ High reliability.
- ★ Intelligent BITE covering all sub-systems.

S706 radar coastal defence and tactical

For coastal defence applications, while still retaining a tactical capability, the ideal solution is the Marconi S706 radar.

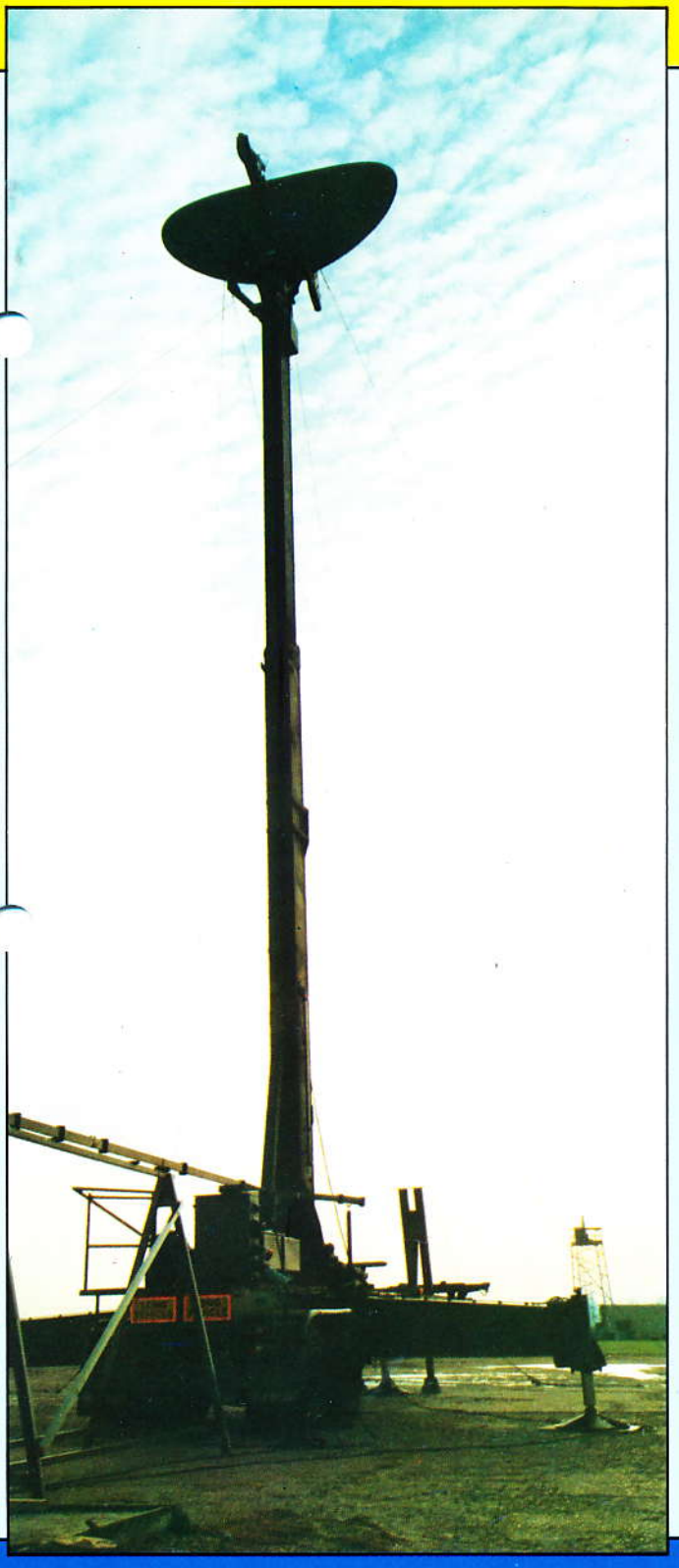


The system incorporates a specially designed trailer mounted antenna with a single curvature reflector and a linear squintless feed, offering unmatched resolution, good sidelobe performance and high gain. The 1 degree azimuth beamwidth, allied to the 0·625μsec compressed receive puls gives the MTI performance and system resolutio essential when searching for small low flying targets in sea clutter environments. If required, full use can be made of the system cover by lowering the p.r.f.

The electronics units and operator positions are housed in a special purpose container, suitable for either ground deployment or trailer/flat-bed vehicle mounting.

The two-vehicle S706 system can be used unmanned in a radar plot reporting role, feeding data via land line or by built-in UHF LOS data link, or manned, when two operators provide a real capability to fulfil track reporting or weapon control functions. In the latter case, the easily loaded operational software facilitates rapid changeover.

- ★ Good detectability of small, low flying targets in dense clutter and ECCM environments.
- ★ Rapid acquisition and identification of targets.
- ★ High data update rate.
- ★ High reliability and field maintainability under adverse conditions.
- ★ Strategic/tactical coastal defence.
- ★ Tactical battlefield surveillance.
- ★ Point defence (SHORAD).
- ★ Versatile communications facilities.



S711 tactical in difficult terrain

The Marconi S711 radar has been specifically designed for use in tactical applications where the terrain includes mountainous, forested or urban areas. To provide unrestricted operation in such conditions, the antenna is mounted on an elevating mast. This mounting method also allows the easy concealment of the radar system, generally more difficult in normal open country radar sites.

The double-curvature antenna reflector is a carbon fibre reinforced moulding, lightweight, requiring negligible maintenance and having a highly accurate profile, all essential features for such a radar system. The antenna horn boom also accommodates the variable vertical-to-circular polariser and the integral secondary (IFF) feed elements.

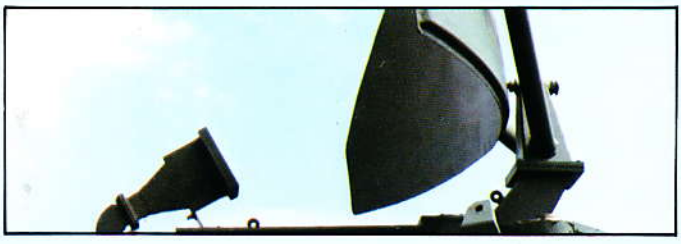
The antenna trailer incorporates built-in stabilising legs and a hinged mast with a telescopic upper section. Elevation of the mast is supplied by a built-in electrically driven hydraulic system, allowing the use of the antenna at 12 metre and 19 metre heights.

No compromise has been made in the performance of the S711, which provides the following features:

- ★ 1·5° horizontal beamwidth and 34dB gain.
- ★ Small targets detected at full 64nm instrumented range.
- ★ Stable mast, ensuring excellent MTI performance.
- ★ Variable antenna tilt, to optimise performance at individual sites.
- ★ Elevated antenna to clear local obstructions.
- ★ Short deployment and crashdown times.
- ★ Low profile semi-trailer, for both on- or off-road use.
- ★ Transportable by road, rail, sea or air (C130 aircraft).

The S711 uses the same electronics/operator container as the S706 radar.

S712 battlefield surveillance point defence



The S712 radar is a single vehicle system, offering the ultimate in tactical availability in either trailer, or flat-bed vehicle configurations. Compatible with SHORAD SAM and AAA systems, S712 provides real capability in battlefield surveillance and point defence applications and features high mobility and off-road ability.

The S712 antenna is mounted directly on the top of the electronics container, and is a smaller version of the S711 antenna, using similar construction methods and again incorporating the secondary (IFF) system.

For transportation purposes, the antenna is dismounted and stowed within the electronics container, the lightweight construction, together with quick-release fasteners, enabling it to be removed by only two people. In a real 'crash-down' situation, the antenna can be left in position and parked 'fore-and-aft', enabling the vehicle to be moved with the minimum of delay.

Features unique to the S712 are as follows:

- ★ Rapid deployment and 'crashdown'.
- ★ Single vehicle configuration – trailer or flat-bed.
- ★ On- or off-road capability.
- ★ Transportable by road, rail, sea or air.
- ★ Performance ideally suited to tactical system.
- ★ 3° horizontal beamwidth.
- ★ 66 nautical mile detection of small targets.
- ★ Excellent ECCM.

The S712 again uses the same electronics/operator container configuration as the S706 radar.

Technical details

	S706	S711	S712
Antenna beamwidth Horizontal Vertical	 1° cosec²	 1·5° cosec²	 3° 7°
Gain	36·5dB	34dB	31dB
Antenna size	7·6×2·4m	5·0×2·75m	2·44×0·9m
Antenna height	trailer	12, 19m	container mounted
Rotation	6rpm	15rpm	15rpm
Polarisation	Horizontal	Vertical to Circular	Horizontal
Instrumented range	64nm (118Km)	64nm (118Km)	64nm (118Km)
Detection range for small target	115nm (213Km)	78nm (144Km)	66nm (122Km)
IFF system	Co-mounted	Integral	Integral
No of vehicles	2	2	1

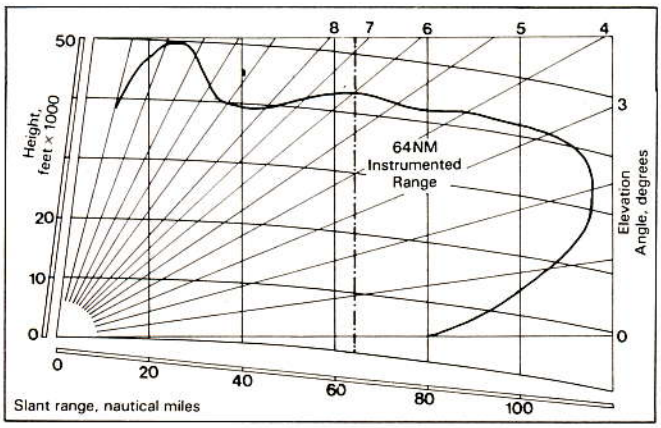
Electronic units

TX power peak/mean	160Kw/2Kw
Frequency	3GHz
Agility and Bandwidth	16 spot freqencies over 300MHz
Pulse width TX ,, ,, compressed	12·50μsec 0·625μsec
PRF	1000
RX noise figure MTI improvement	2dB 50dB
Signal processing and data extraction	Adaptive 12 bit A/D 3 channel, 4 pulse MTI, second dynamic notch, temporal and CFAR thresholding. Video integrator for local PPIs, primary and secondary plot extraction with automatic plot correlation.
Displays and data handling	Two positions with 16" (40cm) PPIs and touch tabular displays, VDTs for system management and BITE control. Locus 16 data handling with 20 track capacity, auto initiation/auto track, GCI on 2 targets. As SSC, 32 tracks and allocations to up to 8 SAM/AAA sites.

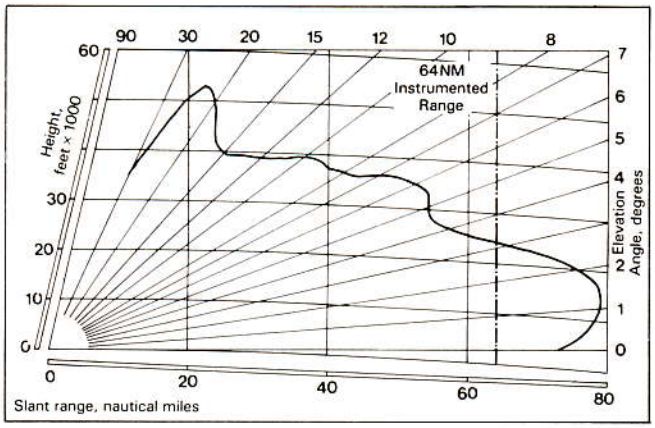
Environment	−20°C to +55°C

Options

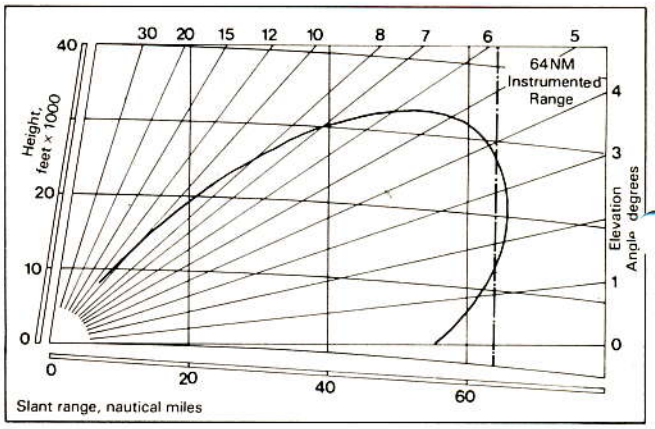
S706	Circular polarisation
S711	Dual-beams
S712	Trailer or vehicle mounting
All systems	Jamming strobe detection, sidelobe blanking, data encryption on LOS link, specific communications, diesel generators, remote control and BITE management for unmanned operation.



S706 radar



S711 radar



S712 radar

Typical cover diagrams on a small aircraft

Tels and PABX

Track reporting post –	4 general use PABX, 6 dedicated tels.
SAM control centre –	2 general use PABX, 8 dedicated tels, 8 remote VDTs.
Ground to air –	2UHF/VHF Tx/Rx.
Ground to ground –	1 HF Tx/Rx for emergency use. 1 UHF LOS with 15 channel multiplexer data link.

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