



**Air
Defence
Systems**

743-D

long range 3D radar

Marconi
Radar Systems

743-D

Transportable long range, 3D surveillance radar

743-D is the latest addition to the very successful family of Marconi 23cm band 3D transportable long range radars. The top of the range 743-D not only meets all operational and technical requirements of current NATO Class 1 radar specifications, but anticipates the changing threat scenario of the future.

Established principles are combined with major advances in planar array, solid state transmission and signal processing technology to give the ultimate in performance. Inherent in the design is the capability to offer non-cooperative target recognition, improved performance against stealth-protected targets, and significantly enhanced detection in clutter.

743-D has been specifically designed for the most severe wartime environment;

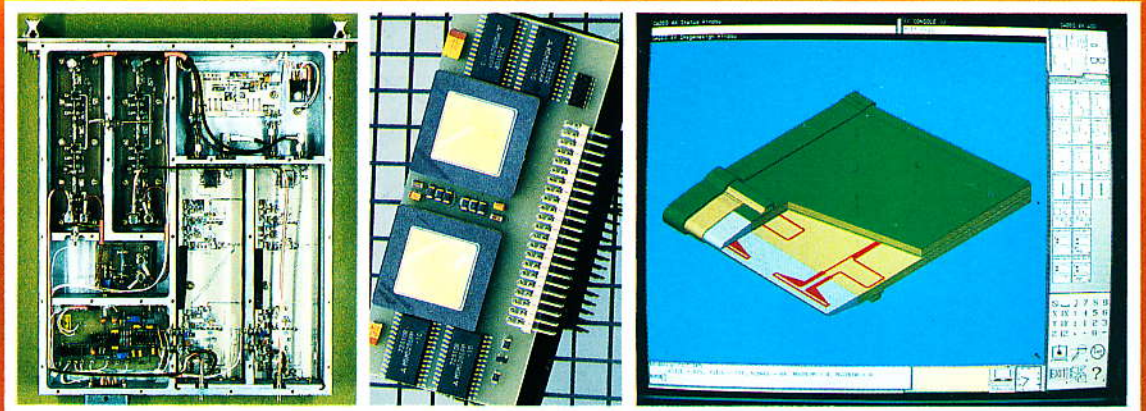
- Wide operating bandwidth is essential to effective ECCM. A new, distributed solid state transmitter provides full coverage of the NATO D band spectrum.
 - A new technology planar array antenna with high efficiency energy distribution yields unprecedented sidelobe levels in both azimuth and elevation. Sidelobe blanking further enhances the resistance of the 743-D to jamming.
 - Adaptive transmit beam pattern control provides burnthrough and horizon-profiling.
 - An unmatched inventory of ECCM techniques.
- Low cost of ownership has been designed into the 743-D. High MTBF, fail soft architecture, automatic hardware reconfiguration, comprehensive BITE and a low level of preventative maintenance — all contribute to very low support costs.

SYSTEM FEATURES

- ★ Operation over full 23cm L band (NATO D band).
- ★ High availability, fail soft system architecture.
- ★ New solid state distributed transmitter.
- ★ New 'state-of-the-art' reconfigurable array signal processor.
- ★ Parallel beam adaptive signal processing throughout cover.
- ★ Uncommitted frequency agility.
- ★ Unsurpassed ECCM performance.
- ★ Automatic radar management with local and remote manual override.
- ★ Integrated SSR/IFF system with Mode S / Mode 4 capability.
- ★ Comprehensive monitoring and diagnostic facilities.
- ★ Minimum down time for preventative maintenance.
- ★ Fully EMP protected.
- ★ Transportable by road, rail, sea and air; also available for static installation.
- ★ Radar environment simulator (optional).

The 743-D continues a tradition of excellence which has already earned The Queen's Award for Technological Achievement for this family of radars.

LEADING TECHNOLOGY - INTO THE FUTURE



743-D's new high-tech components include frequency synthesisers, adaptive array processors, and CAD-CAM laser-cut antenna elements.

PRINCIPLES OF OPERATION

The planar array antenna consists of laser-cut horizontal linear elements vertically stacked, each with its own receiver. Ultra-low sidelobes are achieved by precise control of the phase and amplitude fed to each element. The array is driven by a number of distributed solid state transmitter modules which are phase controlled to give a highly adaptable beam shape in elevation.

Every target within the elevation cover is illuminated on every transmission. Signal returns are combined to form simultaneous overlapping stacked vertical beams, tailored to suit the operational requirement. High accuracy elevation data is derived by monopulse processing of signals in adjacent beams.

A unique new signal processor provides MTD or MTI modes to suppress simple or bimodal clutter, automatically controlled by a clutter map. Parallel coherent processing is carried out simultaneously at all ranges and elevations without reduction of data rate. Signal processing functions are performed by an array of identical modules, each of which can perform any of the required tasks.

Intelligent BITE automatically replaces a failed module with a redundant unit.

An integral SSR/IFF system, with Mode 4 capability, enables correlated primary and secondary radar plot data to be passed to operations centres.

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