



RAN-30X/I SHIPBORNE MULTIMODE SURVEILLANCE RADAR

RAN-30X/I surveillance radar represents the state-of-the-art of X-band surveillance radars.

It can operate as a primary sensor for combined surface and air surveillance on board patrol vessels or as a specialized anti-seaskimmer sensor on board major surface combatants.

RAN-30 X/I features up to 4 operational roles:

- Surface and Air Surveillance mode (detection and tracking of small air/surface targets)
- Navigation and Helicopter control (high antenna rotation speed for navigation close to the coastline)
- Over-the-Horizon (OTH) detection (low antenna rotation speed and long range detection capability)
- Anti-seaskimmer missile detection. This mode has an high antenna rotation rate to ensure the detection and tracking of very small targets manoeuvring in clutter environment and featuring very low Radar Cross Section (R. C. S.).

Each mode has been designed with a proper set of transmitted waveforms.

The reflector antenna performs two different beams (in linear and circular polarisation) to cope with different applications:

- The first beam is a cosecant square one (up to 25°-beam width of elevation coverage) used in Surveillance and Heli modes.
- The second beam (providing a higher gain) is a pencil-beam one, applied for anti-missile detection and Over-the-Horizon mode.

The antenna is designed to house the IFF antenna in a back-to-back configuration.

RAN-30X/I receiver is designed to provide a very high linearity and sophisticated processing. It employs triple conversion with a carrier sample technique.

An automatic and adaptive STC algorithm is implemented against the returns from clutters and wide target radar cross sections.

A different detection and data extraction logic is used to extract surface and air target at plot level. Target identification is confirmed by means of automatic tracker algorithm (at track level).

A set of tracking filter parameters and logics is used in each mode, for Air and Surface Targets.

The RAN-30 X/I command control and extended bite is fully remotable. The new architecture provides the RAN-30 X/I with a higher flexibility in comparison to the normal radar equipment. It can be fully integrated with different ship platforms and Command and Control Systems (point-to-point serial link, FDDI or ethernet ship data).

STATUS

RAN-30 X/I radars are currently in production and on board the "Cigala Fulgosi" OPV Class for the Italian Navy.

TECHNICAL CHARACTERISTICS

Instrumental range

Mode 1 (15 Rpm):	100 Km Air/Surface Surveillance
Mode 2 (30 Rpm):	40 Km Navigation and Heli control
Mode 3 (3 Rpm):	200 Km Over-the-Horizon Surface
Mode 4 (30 Rpm):	25 Km Anti-Missile

Output

Video (raw and processed video). They can be mixed and displayed in range by means of an operational command.
Air and Surface Plot
Air and Surface Tracks (up to 255 System tracks)
Serial/Ethernet or FDDI Bus

Antenna Group

Mechanical Roll and Pitch stabilised platform
Reflector antenna with two different beams

Beam 1 width (at -3dB)

- Vertical:	Cosecant square up to 25°
- Horizontal:	1.2°

Beam 2 width (at -3dB)

- Vertical:	Pencil up to 4°
- Horizontal:	1.2°

Very low azimuth side-lobe level
Polarization (circular and linear for both beams)
Direct axis azimuth brushless pancake motor
Three operative rotation speeds
Provision for IFF-ISLS integration antenna
(back-to-back)

Antenna servo unit

Managing of the stabilisation platform
Speed and space control loop for platform motors
Separate power and control managing for each stabilised axis
Azimuth motor loop correction management (true reference)
Extended bite for each axis
4 separate output azimuth data in synchro and digital
Air cooled

Receiver

Type Linear
Coherent triple conversion
Frequency synthesiser
Digital pulse compression
Programmable waveform and digital expander
Adaptive STC
Carrier sampling technique
Coherent integration with MTD technique
Non-coherent integration
Automatic frequency selection
Automatic Air and Surface plot extractor
Automatic Air and Surface Tracking
Cots boards

Transmitter

X-band, TWT output stage
Type of transmission frequency:
- Full band frequency agility
- Fixed frequency
- Diversity (batch-to-batch agility)
- Coded waveforms
- Prf Stagger

INSTALLATION DATA

Antenna and Platform

- Total height:	mm 2300
- Swing circle:	mm 2400
- Weight:	kg 600

Transmitter

- Dimensions (h d w):	mm (1815x700x694)
- Weight:	294 kg air cooled

Receiver cabinet

Dimensions (h d w):	mm (1815x700x694)
- Weight:	kg 294 air cooled

Antenna servo unit

- Dimensions (h d w):	mm (1815x700x694)
- Weight:	kg 294 air cooled