



## RAN-40L SHIPBORNE LONG RANGE RADAR

**The RAN-40L is a 3D Long Range Early Warning Radar with fully solid state active phased array antenna.**

The RAN-40L radar system derives from SELEX Sistemi Integrati experience on the 3D Long Range Radar. The philosophy of the radar design has been intensively proven on the land based 3D RAT-31DL (Long Range Surveillance Radar provided worldwide to the NATO Countries and Foreign customers).

RAN-40L ensures detection of aircraft up to 400km and a minimum range of 180m.

Radar instrumental range is divided into interval in which different waveforms are used:

- Short Range (SR) waveform for sea, land and weather clutter suppression;
- Long Range (LR) waveform to optimise performance in terms of coverage and ECCM capability;

Radar coverage is obtained by phase-scanning in elevation, while mechanically rotating in azimuth. The antenna rotates at 6 or 12 rpm providing 360° azimuth coverage.

Two independent and simultaneous pencil beams are used in transmission and in reception. High elevation accuracy is guaranteed by monopulse techniques.

The receiver channel is linear in a wide range and it has high dynamic. It uses pulse digital compression techniques to guarantee a suitable average power with low peak power

to provide resistance against ARM (Anti Radiation Missile) without a reduction in resolution.

The STC (Sensitive Time Control) laws avoid the signal saturation, when reflection is too high. The foresaid features, added to frequency agility, allow the radar to operate in intense clutter environment and ECM (Electronic Counter Measures). Excellent ECCMs (Electronic Counter Counter Measures) are assured by low sidelobe antenna, SLB (Side Lobe Blanking), a large number of different frequencies, frequency analysis on azimuth sector, Automatic Frequency Selection (AFS) on Least Jammed Frequency Selection (LJFS), random selection and jam strobe reporting.

Very low antenna side lobe prevents interference outside main lobe. Fixed and adaptive MTI/MTD filters allow to update the clutter maps, optimising its performances against the worst environmental conditions.

Tracker Unit can manage more than 500 real 3D tracks with the assistance during the plots generation process of a sophisticated false alarm control function.

RAN-40L can be easily integrated in all Combat Management Systems and it is completely remote accessible.

HRRP (High Resolution Range Profile) is a growth potential.

## ARCHITECTURE

The system is composed of the following units:

- Antenna Group, with an active planar array
- Receiver Unit
- Service Unit, for the Power distribution and the antenna rotation control
- Local and remote control panel
- Maintenance console unit

## MAIN OPERATIONAL FUNCTIONS

RAN-40L performs the main following tasks:

- Track While Scan (TWS) Air/surface long range surveillance
- Anti TBM role
- Anti missile mode

## STATUS

After a series of technical/operative appraisals in test center of the Italian Navy in Taranto, the RAN-40L is produced by SELEX Sistemi Integrati and is in service as SPS-798 model onboard of the new Cavour aircraft carrier, the De La Penne and the Mimbelli DDG class destroyers of the Italian Navy.

## TECHNICAL CHARACTERISTICS

MTBF	≥1500h
MTRR	≤30min
BITE	=90%
Range Accuracy	< 50m
Azimuth Accuracy	< 0.4°
Height Accuracy	< 0.5°

### Antenna Group

Frequency:	L-band (D-band)
Antenna Rotation Speed:	6 or 12 rpm
Elevation:	0° - 20° (Surveillance) 0° - 30° (ATBM mode) 0° - 50° (Antimissile mode)

Transmitter (in antenna):	Distributed Solid State modules
Antenna Stabilization:	Electronic Stabilization (roll and Pitch)
Antenna Cooling:	Air convection
IFF Antenna:	Optional IFF-ISLS Antenna

### Receiver

Design philosophy:	Extensive use of COTS
Tracking method:	TWS – Track While Scan
IF Dynamic Range:	High Linear Range
Signal processing:	- Beam Forming - Geographic Maps Support - Adaptive STC - MTD/MTI techniques - Sophisticated freq. Selection - Enhanced ECCM functions

## INSTALLATION DATA

RAN-40L is designed in accordance with military standards, also for prevention of mutual interferences with others radars which operate in the same band (MIL-STD-461C).

### Antenna Group (above deck)

- Dimensions:	mm (3900 x 6500 x 2100)
- Weight:	2410 kg (Planar array) 1140 kg (Antenna bade)

### Receiver Unit (below deck)

- Dimensions (h w d):	mm (1720 x 1540 x 550)
- Weight:	650 kg

### Service Unit (below deck)

- Dimensions (h w d):	mm (1720 x 720 x 550)
- Weight:	500 kg

**Size area below deck** 12,5m<sup>2</sup>

