

MFR-10X (Multi Function Radar 10X)

1- Generals

MFR-10X is a high performances X Band Multi Function Radar capable of simultaneous targets Search and accurate targets Tracking. Moreover, MFR-10X integrates other special functions like Missile Illumination and LPI Navigation. Therefore many Search Radars and all the Fire Control Radars of a ship can be replaced by just one MFR-10X, so achieving a significant reduction of the amount of the equipment (cost saving and simplified Logistic Support) and an improvement of the Combat Management System capabilities (reaction time) and a ship's Radar Cross Section reduction as well as a contribution to the ship's Radar Cross Section reduction.

The strong points of MFR-10X are the X band utilisation (that makes affordable a four fixed AESA antenna solution) and the "smart" techniques that compensate the well known limits relevant to the use of the X Band. This approach leads to a modern MFR installable also on board of small ships (Corvette class).

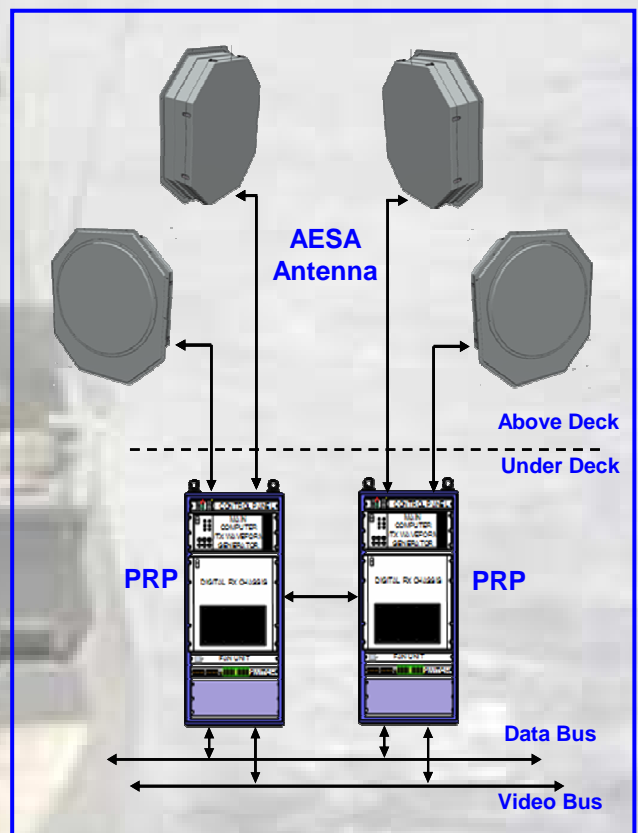
2- MFR-10X Main Features

- X Band
- Four fixed faces high efficiency AESA Antenna
- High Level Programmable waveforms and modes
- Full Digital Processing
- Digital Adaptive Matched Filter
- Programmable mono and bi-dimensional CFAR thresholds
- MTI/AMTI
- Monopulse Processing
- Pulse Doppler Processing
- FFT Spectrum Analysis
- 2D or 3D TWS
- Single Target Tracking (Range, Velocity, Azimuth, Elevation)
- Non Cooperative Target Identification
- High ECM Immunity (very effective ECCM Techniques)

3- MFR-10X Architecture and Composition

MFR-10X is composed of the following main advanced units.

- **X Band AESA (Active Electronically Steering Antenna)**
MFR-10X utilises four solid state fixed AESA antennas working in the 8-12 GHz band. The antennas receive from **PRP** (Programmable Radar Processor) the radar signals to be radiated and send back to PRP the received echo signals in form of Sum (for detection), and Delta Azimuth-Delta elevation (for tracking purposes). Moreover, the antennas receive from PRP also the horizontal and vertical beam pointing directions and the TX-RX command.
- **PRP Unit (Programmable Radar Processor):** "high level programmable" unit used for signals generation and received signals processing. Its programming Mainframe allows a very easy programming of almost all practical radar modes.
- **MMU (MFR Manager Unit):** unit used to manage the MFR in stand-alone operations.
- **APS (Antenna Power Supply)** to provide the necessary d.c. power to the AESA Antenna.



4- MFR-10X Main Operational Modes

The MFR-10X main Operational Modes, that can work in "interlaced" way, are:

<u>VRS</u>	Volumetric Radar Search:	detection of air targets.
<u>LRS</u>	Longe Range Search:	in particular angular sectors
<u>FSS</u>	Fast Surface Search:	fast detection of sea-skimmer missiles
<u>SSS</u>	Slow Surface Search:	detection of low doppler surface targets
<u>PDM</u>	Periscope Detection Mode:	high range discrimination for periscope isolation
<u>STT</u>	Single Target Tracking:	accurate tracking of up to 4 simultaneous targets
<u>IMI</u>	ICW Missile Illumination:	for Interrupted CW missiles operations
<u>LPI</u>	Low Probability of Intercept:	for covert navigation
<u>OTH</u>	Over The Horizon:	far surface targets detection in super-propagation

5- MFR-10X Main Performances

Fully Programmable (Waveforms and Operating Modes)

Frequency Coverage	8 to 12 GHz
Angles Coverage: Azimuth	360°
Elevation	up to +80°
Clutter rejection (land, sea and rain)	>60dB
Radar full scale	300 Km
Air targets (fighter) detection	up to 180 Km
Anti ship missile detection (free space):	40 Km
Anti ship missile detection (with multipath)	25 Km
Periscope Detection	25 Km
Accurate Angles Tracking accuracy	1 mrd rms
TWS Channels	up to 256
ECCM Capabilities	several techniques programmable according to the radar mode

Weight and Power Consumption (Extended Configuration)

Total weight	1500 Kg
Above deck: 4 AESA	1080 Kg
Under deck: 4 APS	200 Kg
2 EPRS	200 Kg
1 Heat Exchanger	150 Kg, 3 KW (option)
Total Power Consumption	65 KVA