

easat[®]
RADAR SYSTEMS

4.5 M

SEA & AIR NAVAL SURVEILLANCE RADAR SYSTEM

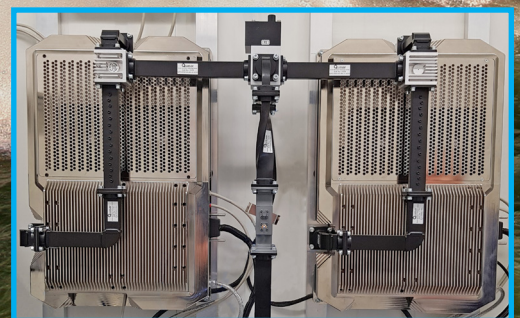
The EA40575 Reflector System provides two separate elevation beams, one optimised for air surveillance, the other optimized for sea surveillance.

The EA45075 antenna is based on a lightweight carbon fibre composite parabolic reflector. Two RF feed horns provide the air and sea beams.

Remotely controlled polarisation switching is provided between Horizontal (HP) and Circular (CP) on both beams. Polarisation can be individually selected for each beam. The antenna can also accommodate various forms of IFF antennas.

The antenna offers 0.52° azimuth 3dB beam-width giving excellent range and azimuth resolution providing excellent target discrimination at long range. Offering a high standard specification, the antenna includes selectable horizontal or circular polarisation for weather penetration on both air and sea beams. On the air beam, the antenna provides inverse cosec² shaping for constant target illumination, and a modified pencil sea beam for long range detection and reduced rain and sea clutter.

The EA45075 antenna is designed for use mounted on a stabilised platform. An Easat turning unit and stabilised platform can be provided, or it can be mounted on a turning unit supplied by the customer.



Easat Solid-State, Dual Redundant
350 Watt X-Band Transceiver



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General & Mechanical*

Type	Shaped Reflector
Nominal Dimensions (m)	4.5 x 0.75
Total Weight inc. Turning Gear & Motor (kg)	150
Height (m)	1.1
Max. Swept Radius	2.4
Rotation Rate	Up to 40 RPM

Environmental*

Maximum Wind Speed	160 KPH (160 MPH) Operational 110 KPH (68 MPH) Survival
Temperature	-30°C to +70°C (-22°F to + 158°F) inc. Solar Gain
Humidity	Up to 100%
Altitude	Sea Level to 2,500m
Protection	Suitable for Coastal & Marine Environments
Design Life	20 Years

System Electrical Specification*

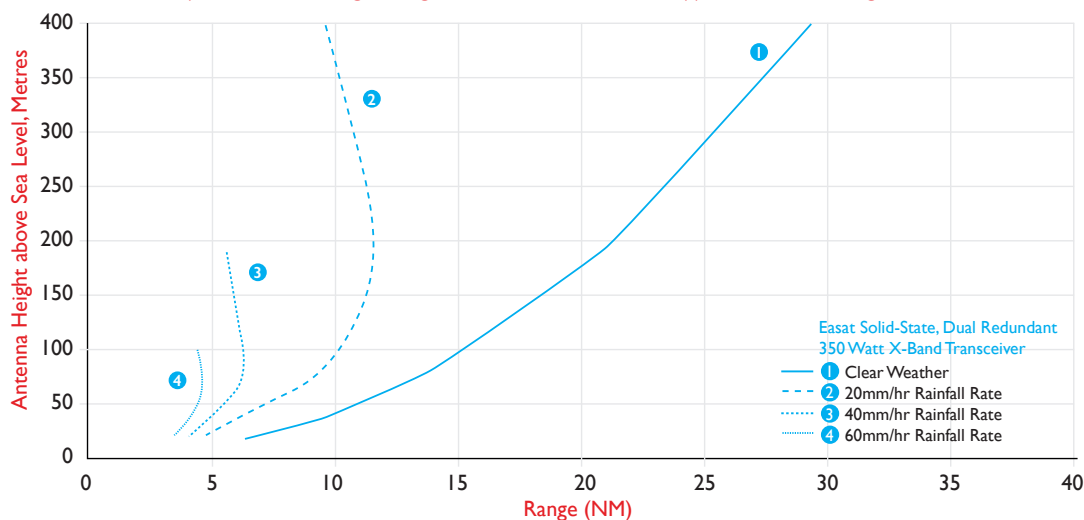
Beam Characteristics	Air-Beam	Sea-Beam
Frequency Range	X-Band, 8.80 to 9.10 GHz	X-Band, 9.20 to 9.50 GHz
Gain	≥ 37 dBi	≥ 38 dBi
VSWR	≤ 1.5:1	≤ 1.5:1
Azimuth Side-Lobes	±5°	≤ 24 dB
	±5° to ±10°	≤ 30 dB
	Back-Lobes	≤ 35 dB
Azimuth -3 dB Beam-Width	0.52° ± 0.05°	≤ 0.53°
Elevation Beam-Shape	Cosec ² Modified to give Extra Gain from 15° to 35° Elevation	Modified Pencil Beam
Elevation -3 dB Beam-Width	4° ± 0.5°	3.8° ± 0.5°
Angle between Peaks of Air & Sea-Beams	≤ 3.8°	
Polarisation	Selectable HP / CP	
ICR	≤ -17 dB min. ICR in Principle Azimuth & Elevation Planes	
Cross Polar (HP)	≤ -20 dB at Beam Peak	

PERFORMANCE DATA

SEA DETECTION

Easat 4.6m Reflector X-Band Coastal Surveillance System Sea Detection Performance in Clear & Various Rainfall Rates: **Target Type 1***

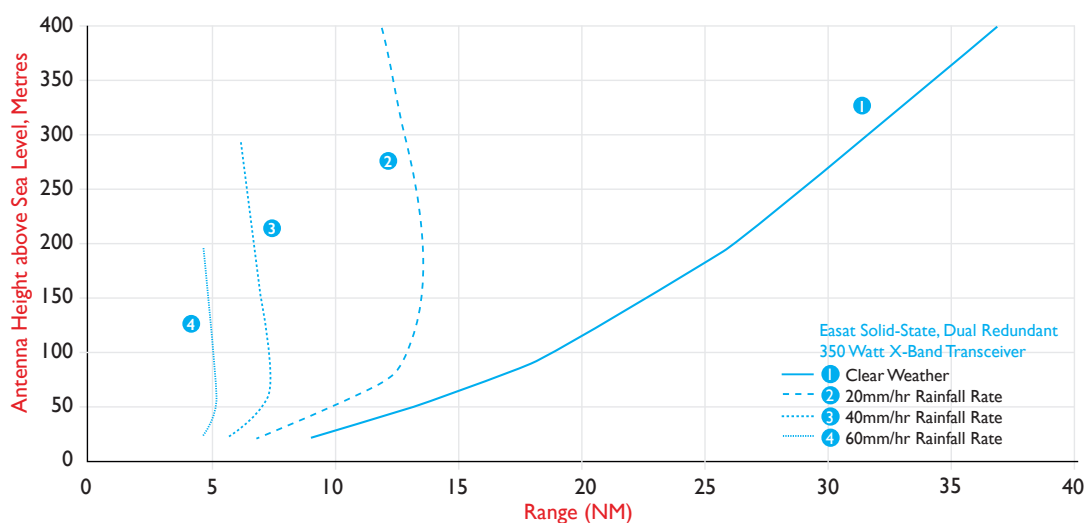
(RCS = 1m² at Target Height of 1m Above Sea Level, Typical of Small Fibreglass, Wood or Rubber Open Boats)



Sea surface target detection range versus antenna height above sea level for IALA Target Type 1 (RCS = 1m² at target height of 1m above sea level) in clear weather plus a variety of rainfall rates. This typically represents small fibreglass, wood or rubber boats. Range increases from 6 to 15 NM for antenna height between 20 and 100 m as may be expected when the system is ship mounted. At higher elevations range can exceed 30 NM.

Easat 4.6m Reflector X-Band Coastal Surveillance System Sea Detection Performance in Clear & Various Rainfall Rates: **Target Type 2***

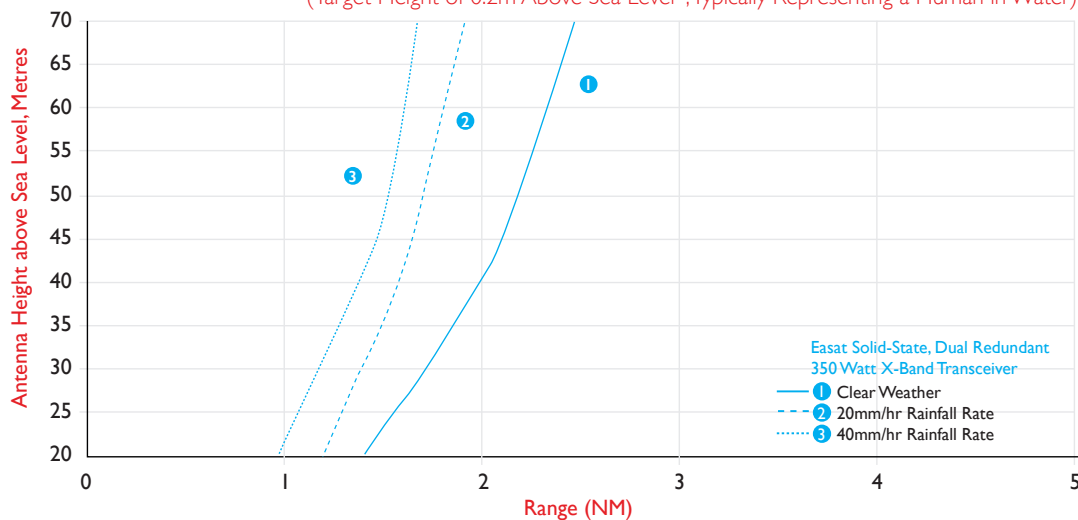
(RCS = 3m² at Target Height of 2m Above Sea Level, Typical of In-shore Fishing Vessels, Sailing Boats and Speedboats)



Sea surface target detection range versus antenna height above sea level for IALA Target Type 2 (RCS = 3m² at target height of 2m above sea level) in clear weather plus a variety of rainfall rates. This typically represents in-shore fishing vessels, sailing boats and speedboats. Range is between 9 and 19 NM for antenna height between 20 and 100 m as may be expected when the system is ship mounted. At higher elevations range exceeds 37 NM.

Easat 4.6 m Reflector X-Band Coastal Surveillance System Sea Detection Performance in Clear & Various Rainfall Rates: **RCS = 0.05m²**

(Target Height of 0.2m Above Sea Level*, Typically Representing a Human in Water)



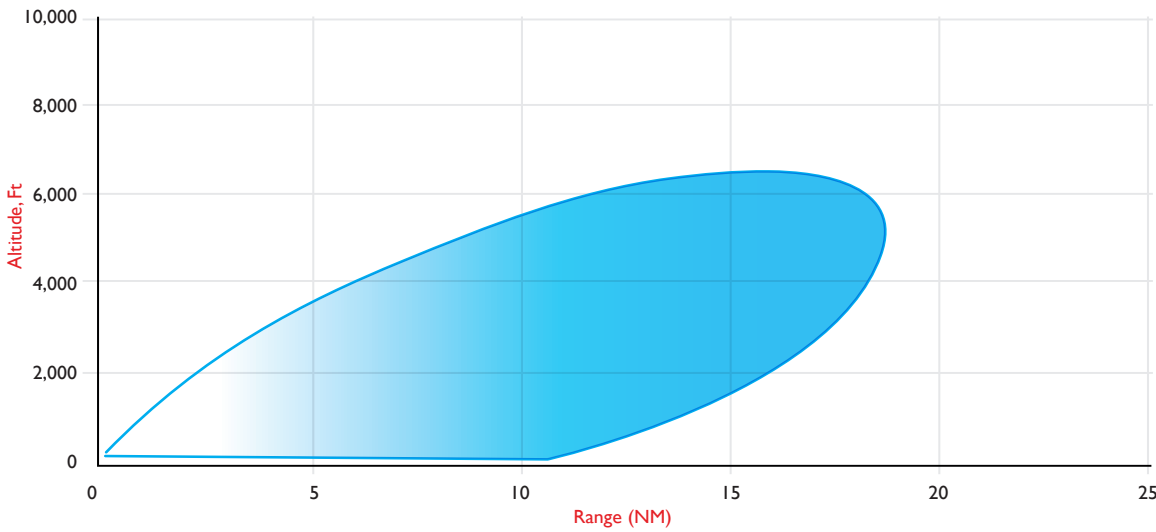
Sea surface target detection range versus antenna height above sea level for very small target size (RCS = 0.05 m² at target height of 0.2 m above sea level, representing a human in water) for both clear weather plus a variety of rainfall rates. The sea beam of the Easat 4.6 m Reflector Coastal Surveillance System can detect very small targets in the water at a range exceeding 2 NM.

PERFORMANCE DATA

AIR DETECTION

Easat 4.5m Reflector X-Band Coastal Surveillance System Small Target

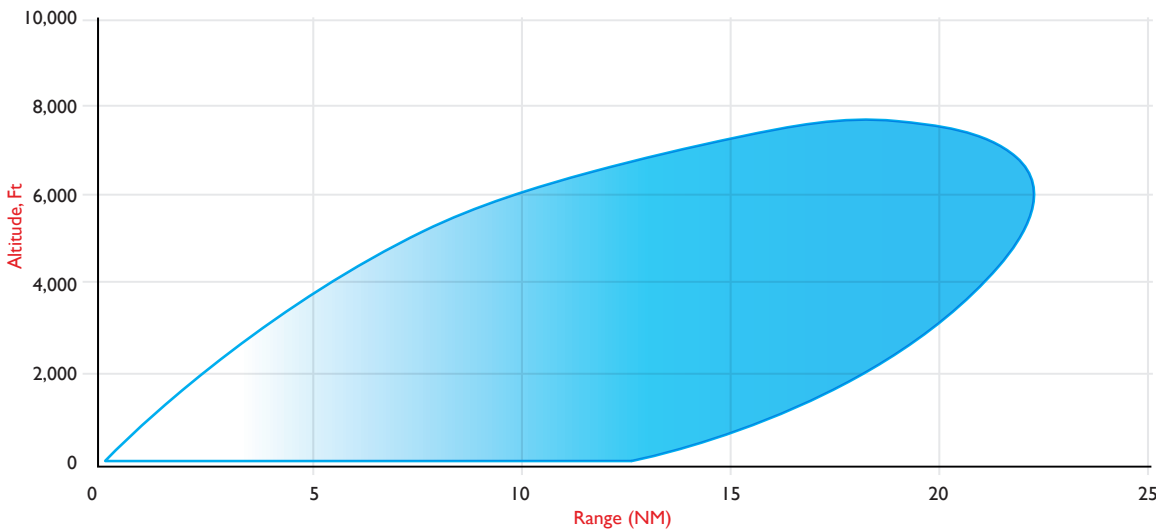
RCS = 1m² Air Detection Performance in Clear Weather*



Air target detection range versus target altitude above sea level for a 1 m² RCS target, based on a 75 m tower height, with Pd = 80% in clear weather. The addition of an extra beam for air coverage with a strong ground cut off provides excellent air coverage with minimal multipath effects.

Easat 4.5m Reflector X-Band Coastal Surveillance System Small Target

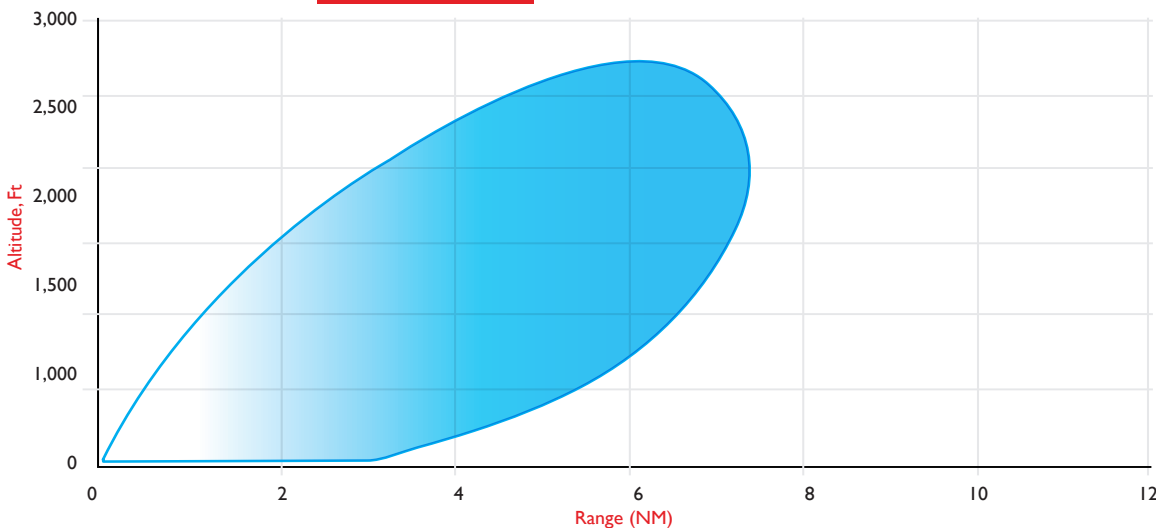
RCS = 2m² Air Detection Performance in Clear Weather*



Air target detection range versus target altitude above sea level for a 2 m² RCS target, based on a 75 m tower height, with Pd = 80% in clear weather. Range exceeds 20 NM at altitude approaching 8,000 ft.

Easat 4.5m Reflector X-Band Coastal Surveillance System Small Target

RCS = 0.05m² Air Detection Performance in Clear Weather*



Air target detection range versus target altitude above sea level for a very small target size (0.05 m² RCS, typical of a small drone), based on a 75 m tower height, with Pd = 70% in clear weather. This dual beam system achieves a range exceeding 7 NM even for these especially small targets.