

# easat<sup>®</sup>

RADAR SYSTEMS

## X & S BAND

### TRANSCEIVERS FOR USE IN COASTAL SURVEILLANCE RADAR SYSTEMS

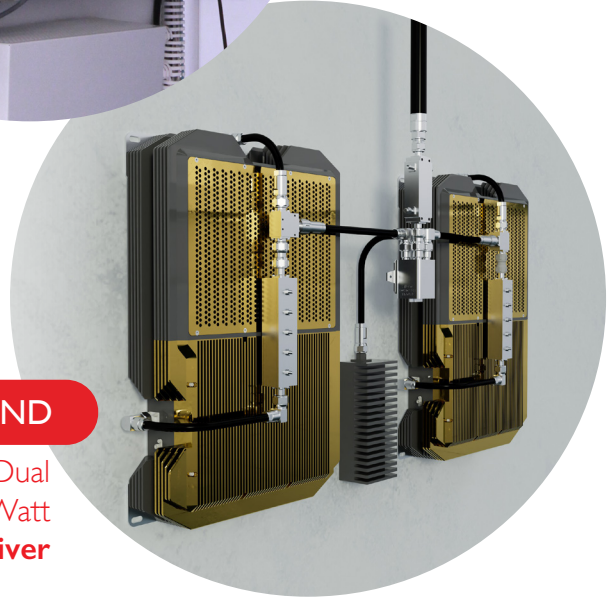
Easat offer S-Band, X-Band or Combined S & X-Band, Solid-State, Dual Redundant, High-Power Transceivers to complement our range of High-Gain, High-Resolution Antennas.

Easat's Coastal Surveillance Radar Systems provide Excellent Performance Detection of both Large and Small Targets in all Weather Conditions.



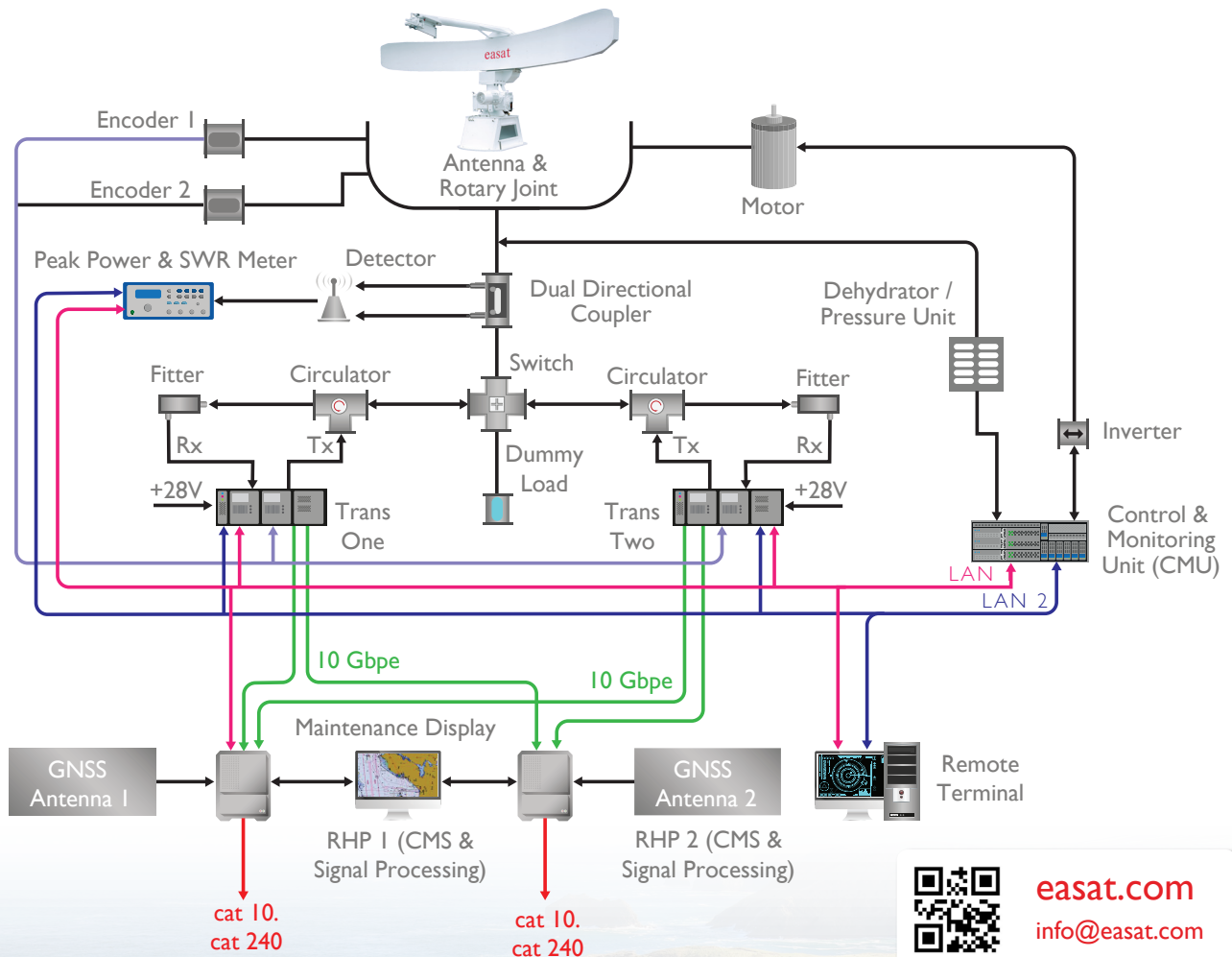
Easat Solid-State, Dual Redundant 350 Watt X-Band Transceiver

X BAND



S BAND

Easat Solid-State, Dual Redundant 800 Watt S-Band Transceiver




[easat.com](http://easat.com)  
[info@easat.com](mailto:info@easat.com)

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

RF Frequency Range	9.0 - 9.5 GHz
Output Peak Power	>300 W (typ. 350W)
Pulse Width, Short	25 ns
Pulse Compression Ratio, up to	3000 (Typically 2000)
Azimuth Coverage	360°
Antenna Rotational Speed	60 RPM
Processing Delay (Raw Video)	< 250 ms
Overall Dynamic Range	140 dB
Noise Figure	<3.5 dB
Range Cell Size	1.875 metres
Range Resolution (Raw Video)	≤ 5 meters
Range Accuracy	≤ 3.5 metres
Azimuth Resolution	≤ 0.43 deg
Azimuth Accuracy	≤ 0.09 deg
Complies with IALA requirements	Advanced Level
Temperature Range	0°C to 35°C
Relative Humidity	10% - 80%
X-Trac Redundant System Power Consumption	2.5 kW

Conventionally X-Band has been the normal choice for surface target surveillance (such as ships and boats) whereas S-Band is the commonly chosen for air targets. For a high installation looking at a surface targets X-Band will give the best range performance for a practical, commercial system in clear weather. This is due to the physics of the interaction of the radar signals with the surface of the Earth. In practice conditions are rarely ideal, with rain and/or high sea conditions often exploited for illegal activities. In heavy rain, X-band suffers from serious range degradation due to both high clutter reflections (even using circular polarisation) and extra range loss induced by the rain itself.

S-Band from the same high elevated site is largely unaffected by poor weather conditions, but will not have as longer range as X-band in clear weather. As an example (referring to the figures on p7) using a radar 200m above sea level X-Band will “see” a small target in clear weather to 29 NM but in 20mm/hr of rain the range is reduced to 20 NM, reducing further still to only 10 NM in 40 mm/hr of rain. S-Band provides a similar range to X-Band in 20 mm/hr of rain but continues to provide coverage to 19 NM even in 60 mm/hr of rain.

In these figures, the latest Easat high gain, high resolution antennas and digital, solid-state transceivers are used.

## Easat Solid-State, Dual Redundant 800 Watt S-Band Transceiver\*

RF Frequency Range	2.9 – 3.1 GHz
Output Peak Power	≥ 800 W
Frequency Sub-Bands	201 Carriers
Frequency Diversity	Yes, any 8 of
Pulse Width, Short	50 ns
Short NLFM Signal Width (typical)	5 μs
Long NLFM Signal Width (typical)	75 μs
Pulse Compression Ratio, up to	2000
Dynamic Range (with Pulse Compression and STC)	≥ 130 dB
Power Changing in Sectors	0 - 16 dB
Power Blanking in Sectors	≥ 60 dB
Instrumental Range	up to 48 NM
Pulse Repetition Frequency (Period)	1 - 5 kHz (200 ... 1000 μs)
Stagger, up to	30
Receiver Transfer Function	Linear
Bandwidth	≥ 30 MHz
Intermediate Frequency	300 MHz
Digitising Frequency	240 MHz
I/Q Sampling Frequency	40 MHz
Noise Figure	≤ 2.5 dB
Range Cell Size	3.75 metres
Range Resolution (Raw Video)	≤ 15 meters
Range Accuracy	≤ 7.5 metres
Azimuth Coverage	360°
Antenna Rotational Speed	6 ... 22 RPM
Processing Delay (Raw Video)	< 250 ms
Data Exchange Format	ASTERIX CAT240 and CAT10
Temperature Range (In a Temperature Controlled Environmental Enclosure)	0°C to 35°C
Relative Humidity	10% - 80%
S-Trac Redundant System Power Consumption	< 3 kW Combined Duty and Stand-By

Depending on the particular site S/X-Band dual band radar often provides the optimal detection solution.