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**Sea Tel<sup>®</sup>**

# **QOR<sup>™</sup>: Quadrature Oriented Reflectors**



**Sea Tel**  
*COBHAM*



## Quadrature Oriented Reflectors (QOR) consist of two independent antenna systems on a single marine stabilized pedestal.

The 9797 QOR (Quadrature Oriented Reflectors) pedestal architecture consists of a standard 2.4M offset C-band antenna and an orthogonally mounted 1.2 Meter Ku-band antenna system on a single pedestal. The Intermediate Frequency (IF) cable can be switched electronically allowing for either C-band or Ku-band operation in a matter of seconds.

QOR technology is being incorporated in TV-at-Sea (Model 6011) and Communications-at-Sea (Model 9797) systems. Some of the main features of the QOR systems are:

Features	Benefits
Global C-band coverage utilizing an electronically switchable feed from A to B POL.	There is no longer a need to make any changes to the C-band feed to switch from A to B POL.
C-Circular/Linear switchable feed.	Allows the switch from C-band Circular operation to C-band Linear operation electronically.
All in one Ku and C-band coverage.	No more manual feed changes means increased productivity and eliminates possible errors.  Co Pol and Cross Pol for Ku Band.
Only one antenna needs installed	Reduction in installation time and maintenance. Increased premium deck space on the ship.
All values for C and Ku-band stored as separate parameters in the DAC	No more manual inputting of new values for C and Ku-band operation

### Software Implementation:

The QOR software will allow for the storing of completely separate sets of DAC (antenna control unit) and PCU (pedestal control unit) parameters depending on the antenna system that is selected. Once the desired system is chosen, the parameters are loaded in to the DAC enabling targeting of the desired satellite.

There are several new commands that have been introduced in the software that will allow the QOR concept to provide seamless operation and improved productivity. These new commands will allow for Ku-band Co pol and Cross pol selections as well as reflector selection.

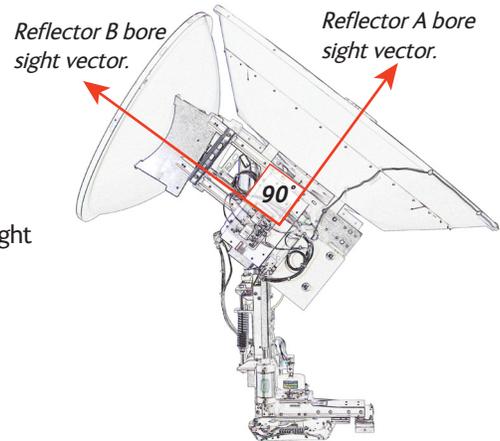
To fully accommodate all possible tracking selections, the tracking display windows have been updated to include all possible C and Ku-band selections. This is a total of twelve selections that can be made from the tracking display window in the DAC 2202/2302.



DAC 2202 Front Panel

### Theory of Targeting:

A reflector offset has been implemented that sets the angle from the rear projection of reflector A's bore sight pointing vector to reflector B's bore sight pointing vector. The ideal setting is 90 degrees but may require slight adjustments depending on optimum angle position of the counteracting reflectors.



### Operational Details:

When switching from reflector A (C-band) to reflector B (Ku-band), the reported values for cross level, elevation, azimuth, relative, and polarization change. The position of the antenna does not change until a command to target the reflector is issued. This will allow cycling from reflector A and B without moving the antenna from its current position.

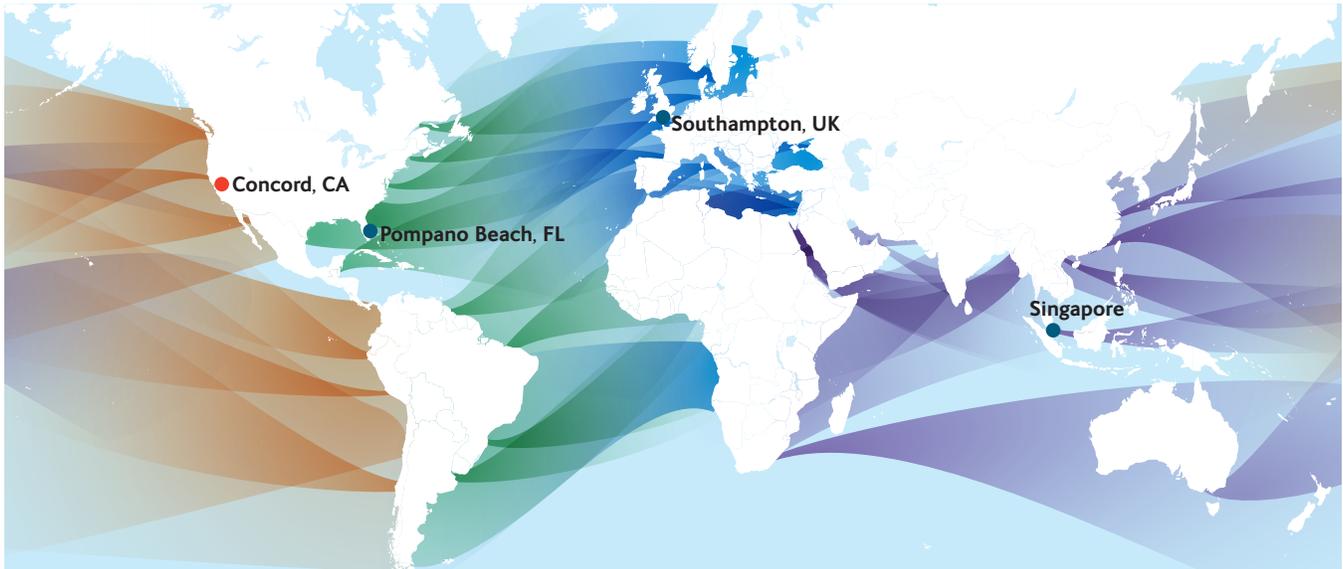
The antenna remains fully compatible with the existing Sea Tel web interface and external modem controls. It is compatible with OpenAmip and ABS technology.

### Antenna Setup Details:

Parameters that are set at the time of installation will be stored upon saving the configuration. These parameters that are specific to the appropriate reflector setting will be retrieved and dumped in to the DAC once the reflector is selected.

### Why QOR Technology:

QOR stands for "Quadrature Oriented Reflectors" and identifies a 90 degree phase shift of two or more objects. QOR technology is the leading edge antenna system for truly global operations that maximizes productivity. QOR technology requires minimal manual intervention such that the operator errors are reduced to a minimum while making the switch from A pol to B pol on the C-band circular, moving from C-band circular to C-band linear, and moving from C-band to Ku-band operation. No more climbing in to the dome to change a feed. System integrators can save the antenna system Parameters at the time of commissioning and recall the values with a single push of the button. An all in one solution has been developed by Sea Tel that can be controlled electronically without manual change overs.



## **Sea Tel** COBHAM

The most important thing we build is trust

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