

***NORTHROP GRUMMAN***

# **BridgeMaster E Series Radar**

**United States Military Naval Radar Solutions**



**Sperry Marine**

## BridgeMaster E Series of Naval Radars Standard Features

Sperry Marine's BridgeMaster E radars, with an unparalleled combination of features, provide enhanced situation awareness as well as effective, efficient navigation for the U. S. military. The standard BridgeMaster E ARPA radar package includes:

- 60 surface target tracking
- 150 knot relative tracking speed
- Automatic and manual target acquisition
- Multilayer radar maps
- Four day/night presentation modes
- Tracking history with playback facility
- Simple point and click operation
- Comprehensive range of on-screen features and radar tools
- AIS display capability fitted as standard
- Full IBS interfacing to DNV Watch One



### Designed from Experience

Incorporating the combined knowledge base of Sperry Marine, Decca and CPlath, the BridgeMaster E radar design meets U. S. military requirements and packs over 300 years of marine experience into an extensive range of products and systems to meet customer requirements.

### Configured for Flexibility

BridgeMaster E radars offer unprecedented flexibility of design as well as selection of displays and configurations. Everything ranging from simple COTS elements to the most powerful tactical system can be supplied to provide exceptional military capability for any type, size and class of vessel. The BridgeMaster E radar design enables easy integration and interfacing to other onboard systems.

### Developed, Designed and Tested for the Military Market

The BridgeMaster E Navigation Radar series provides advanced navigation support for the toughest military assignments. Enhanced fea-

tures, high performance configurations, and exceptional military capability define the BridgeMaster E Naval radars.

### BridgeMaster E Naval Radars Offer Display Choices

The BridgeMaster E Naval Radar displays provide an outstanding selection of features and capabilities to improve efficiency and offer exceptional capability at very competitive costs.

### Main Features of the Navalized Display:

#### Red First Strike

Red First Strike shows fast moving targets such as aircraft and fast attack craft by highlighting them in red. This feature improves the operator's reaction time by simplifying potential threat identification.



## Target Intercept

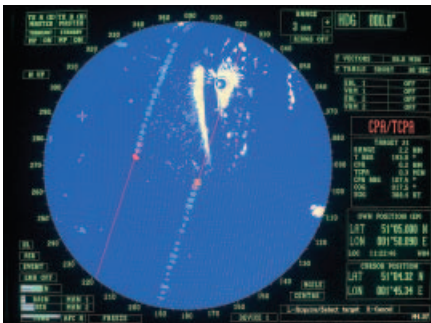
Target Intercept enables the radar operator to plan and implement an interception of a tracked target. This is particularly useful in maritime interdiction operations (MIOPs).

## Helicopter Approach

This feature provides the ability to set up an approach sector on the screen, which is especially valuable in conditions of poor visibility. The radar operator is able to check the status of the helicopter's approach and offer guidance to the pilot. And, the approach sector may be set up on ownship or on any tracked target.

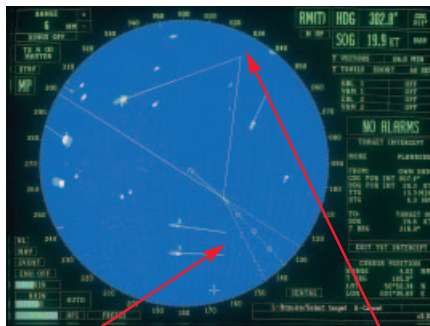
## Freeze Frame

This feature is used whenever it is necessary to impose radar silence. Once the operator activates this function, the radar display shows a still image of the radar situation immediately before radar silence was ordered. The operator can activate this function locally or it can be imposed remotely.



## Advanced Index Lines

Index lines are often used for blind piloting operations. Sperry Marine's navalized display allows up to 15 index lines to be displayed simultaneously in groups of five. The operator can clip the lines to the exact length required in order to reduce clutter. In addition, these lines may be prepared in advance and stored on a memory card for future use.



Helicopter Approach Sector

Target Intercept

## Range Yards

The navalized display offers the operator a choice of the standard radar distance units of nautical miles, kilometers or statute miles or of yards. The units selected will be set during commissioning.

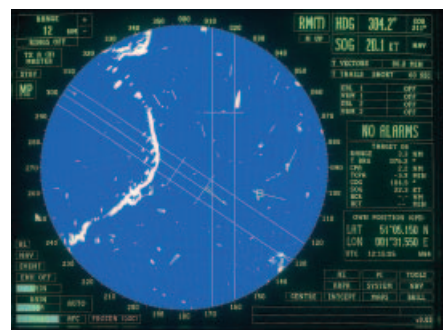
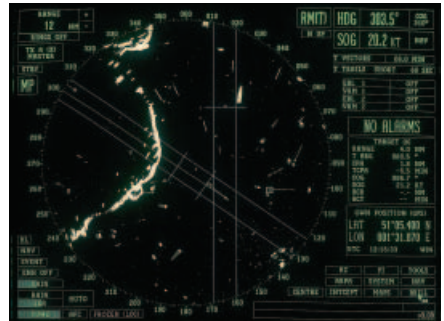
## Tactical Display

The BridgeMaster E Tactical Display is the first marine radar system in the world that is able to display inputs from two totally asynchronous radar heads simultaneously in the same video circle. This advanced radar system combines unique naval features with powerful configurations and options that far exceed those of its predecessor.

## Main Features Asynchronous Secondary Radar Input

The BridgeMaster E tactical display can show input from a totally asynchronous radar. This second input can be from either a BridgeMaster E transceiver or, in some instances, from another manufacturer's radar. Any combination of radars can be used, e.g., two X(I)-band radars or an X(I)-band and an S(E/F)-band or an X(I)-band and an RRB. Using a second input from another BridgeMaster E radar allows the operator to control both radars through a

single display. Plus, the operator can track targets from either radar, and the software ensures that a target will only be tracked once.



Advanced index lines can be clipped to exact length to reduce clutter

## 600 Knot Target Tracking

The BridgeMaster E tactical display is ideal for the detection, tracking and interception of fast moving targets. It can track targets at speeds of up to 600 knots. And, target maneuvers can move up to 4G, depending on target range, antenna rotation rate and local clutter conditions.

## Sector Transmission

This feature allows the operator to define two sectors in which transmission is to take place while radar silence is maintained on all other bearings. Each defined sector will remain stable with respect to north even if ownship alters course. This ability is especially useful when radar silence is required over a particular arc, but radar watch is needed on a bearing of interest.

Red First Strike highlights an aircraft doing a 4G turn

## Station Keeping

In inclement weather or at night it is often difficult to maintain station on surrounding vessels. The Station Keeping feature allows the operator to define a sector for every nearby vessel so he can immediately see if any vessel has moved from its correct location.



## Additional Range Scale

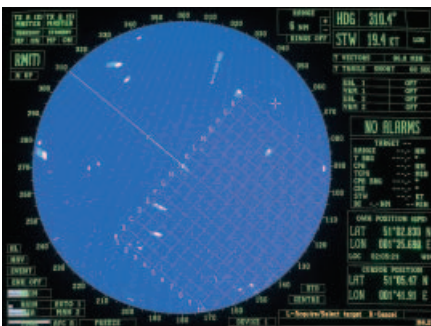
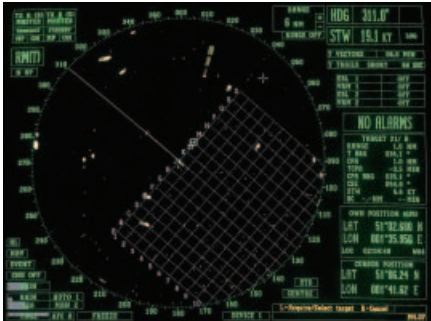
Realizing the need for long-range capability, the tactical display is equipped with an additional range scale of 192nm. This feature is particularly useful when used in conjunction with a long-range radar system to provide a secondary input to the tactical display.

## Navalized Display Capabilities

All features of the BridgeMaster E navalized display are included as standard on the tactical display. The one exception is the station keeping feature which is replaced on the tactical display with the Convoy Sector.

## Other Features:

The tactical display includes Bearing to the Closest Point of Approach (BCPA), and a training simulator that provides scenarios to be used for operator training.



Convoy Sectors

## Convoy Sectors

This feature allows the operator to display NATO standard convoy sectors using either XY(4W) or polar grids for convoy/battle group position control. The grid can be referenced to the guide ship, which could be either ownship or a selected tracked target. With the XY grid option the operator is able to rotate the grid when the convoy axis changes. If ownship or other vessels deviate from their required station, the grid provides the operator with early notification.

## Weapon System Interfacing

The BridgeMaster E tactical display can interface with other shipboard equipment, receiving input from a weapon system or a night vision system via an optional communications board. It can also output data on designated tracked targets to other systems, providing range and bearing information. That data can be used to align the night vision or weapon system to a suspicious contact.



## BridgeMaster E Transceivers offer a number of options

All transceivers in the range use standard commercial frequencies so potentially hostile targets see them as merchant rather than military radars.

The transceiver acts as a centralized distribution for radar synchronization. It accepts external trigger input (200Hz-10KHz) that synchronizes its transmission with other systems. Three independent adjustable pre-trigger signal outputs, which may be used by ownship's EW systems, avoid damage when a radar pulse is transmitted.

The BridgeMaster E naval transceiver has two positive and two negative radar video outputs, so that the video is available to other systems without the need for additional signal inversion circuitry. There are also two sets of bearing data output in serial format (heading marker and incremental azimuth information).

The wide range of inputs and outputs allows BridgeMaster E radars to interface quickly and easily with other onboard systems thus reducing the complexity of the system and associated costs.

## BridgeMaster E Naval Radars – Exceptional capabilities at competitive Costs

Enhanced Features, High Performance Configurations, Versatile Applications

- Display choices – COTS, Navalized, Tactical
- Easy Integration and Interfacing with earlier Decca radars or other units within the BridgeMaster E range
- Flexible configurations with a choice of antennas in an array of sizes with masthead or bulkhead transceivers
- A variety of display formats, including standard CRT desktop, floor standing, or optional flat panel displays or in flat panel kit format
- Man-Machine Interface controls may be either a trackball, joystick or the option of a dedicated keyboard



*Image from [www.news.navy.mil](http://www.news.navy.mil)*



# BridgeMaster E Series of Military Radars

## System Configuration Diagram

**Scanner**



Antenna - X(I)-band (3cm) 4ft, 6ft, 8ft or S (E/F)-band (10cm) 9ft, 12ft  
Turning Unit - COTS or Additional Features

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**Transceiver**



COTS or Additional Features  
Bulkhead or Masthead  
10kW or 25kW X(I)-band or 30kW S (E/F)-band



Naval Bulkhead  
25kW X(I)-band



**Interswitch**

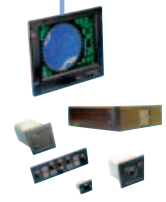


2 Way



6 Way

**Display**



Display Choices: COTS, Navalized, Tactical, 180, 250, 340, CRT, Flat Panel, Deck Standing, Desk Top, and Kit Format

**Type Approvals**



Australia



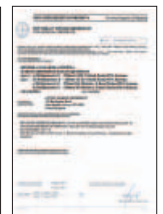
United Kingdom



United Kingdom



United Kingdom



Croatia

Sperry Marine, with worldwide headquarters in Charlottesville, VA, and major engineering and support offices in Melville, NY, New Malden, England, and Hamburg, Germany, is part of the Northrop Grumman Electronic Systems sector.

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