

RDR-1500B

Search and Surveillance, and Weather Avoidance Radar System



The primary mission of the RDR-1500B is an airborne search and surveillance radar system for sea search operations.

Telephonics RDR-1500B Search and Surveillance, and Weather Avoidance Radar System is designed to provide multi-mode radar capability for helicopters and fixed-wing aircraft in a multitude of low and medium altitude maritime missions. The primary mission of the RDR-1500B is an airborne search and surveillance radar system for sea search operations. Secondary missions include terrain mapping, weather avoidance, beacon navigation and display of navigation information from the aircraft navigation system. The system is also compatible with night vision goggles (NVIS-A).

The RDR-1500B is a lightweight, X-band, 360-degree digital color radar system.

The system is comprised of five line replaceable units: the receiver-transmitter, color indicator, antenna and drive, interface unit and control unit. Various options are available to customize the RDR-1500B to meet user airframe and operational requirements. Among these options are a choice of two different sized radar multi-function indicators: a 9-inch console display and a 6-inch cockpit display. Another available option is a 120-degree forward sector scan antenna and drive.

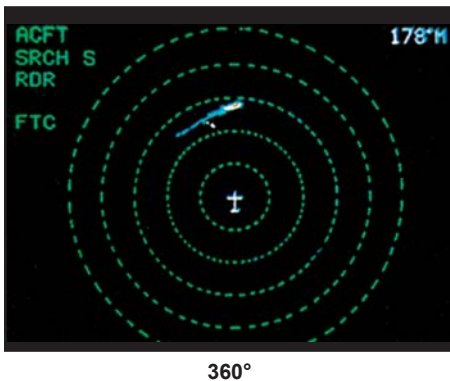
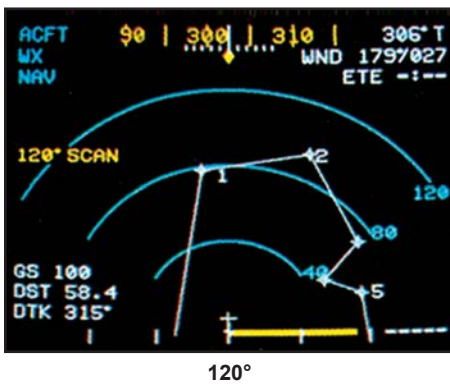
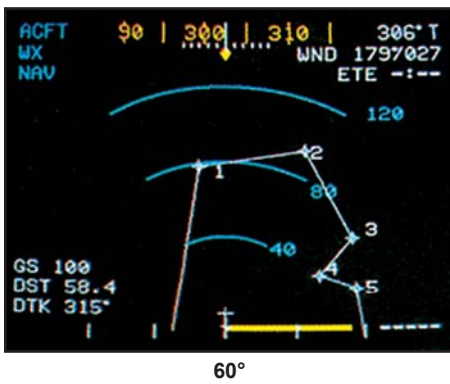
The RDR-1500B offers standard display modes including aircraft heading reference, North-oriented and ground reference. The system also has the

capability to offset the sweep center to any location on the display. Additionally, the RDR-1500B has target marker capability allowing the operator to determine range and bearing (or latitude/longitude) of a target from the aircraft and also relative range and bearing between targets.

The system provides three basic operations: surface search and detection with sea-clutter rejection, weather avoidance, and radar beacon interrogation and display. A color indicator included with the system displays the radar returns and will also interface with aircraft navigation systems to display information such as search patterns, waypoints and flight log information.

Modular design allows system flexibility for connection to a variety of navigation sensors such as VLF Omega, INS, GPS, Doppler and RNAV. Other system capabilities include: sector scan, long-range navigation position update and target position transmission.

Display Scan Modes



Display Modes

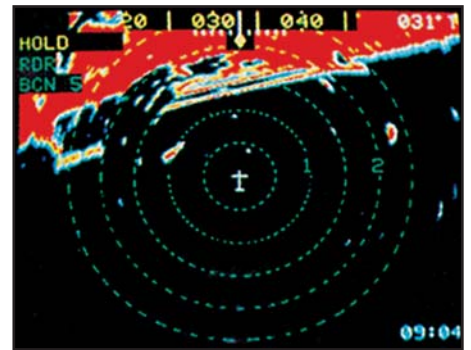
Various display modes are selectable via the CN-1506A Control Unit.



Control Unit

ACFT Heading Reference Mode

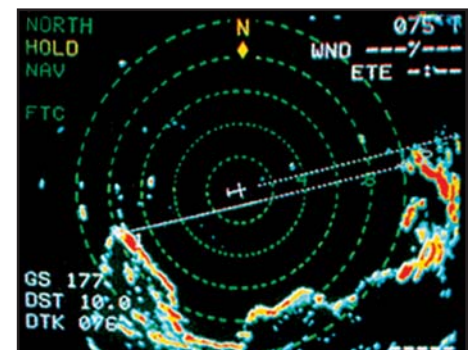
In the ACFT Heading Reference Mode, the radar image is presented on the indicator display with the aircraft heading straight toward the top of the screen. In the NAV mode, heading markers and compass card are displayed at the top center of the screen and a deviation bar is displayed at the bottom center of the screen.



ACFT Heading Reference Mode

North Reference Mode

In the North Reference Mode, the radar image is displayed with North at the top center of the screen. A North marker appears at the top, and a heading vector points in the direction of the aircraft's heading.



North Reference Mode

GND Reference Mode (True Motion)

In the GND Reference Mode, the scene remains as a stationary display, while the aircraft symbols and concentric range rings on the screen move over it. The scene is continuously updated so that objects in motion move over the fixed returns. The scene center can be relocated using the control unit. A North marker appears at the top, and a heading stroke points in the direction of the aircraft's heading. The display HOLD control may be used to temporarily freeze the display, highlighting the position changes of moving targets.

Search Mode

The system has a Search Mode with nine ranges that can detect and display targets to a minimum range of 500 feet. Even under adverse conditions, targets such as a small boat will be detected.

The search mode permits searching for ships at sea, terrain mapping of topographical features (bodies of water, islands, bridges, etc.) and mapping of coastal areas. Operator-controlled gain and sensitivity time controls are provided in the search mode.

The search mode has three pulse widths available. When in the search mode with the pulse width selection in auto, the

following pulse width criteria are provided:

Range (Nmiles)	Pulse Width (microsec)
Up to 10	Short (0.1)
Up to 20	Medium (0.5)
Above 20	Long (2.35)

In addition, the operator may manually select medium or long pulse widths in any range.

A Fast Time Constant (FTC) clutter rejection circuit is provided for searching of targets in heavy sea clutter environments. The FTC is operator selectable.

Offset Mode

The Offset Mode may be selected at any time to bring the target of interest to the center of the radar screen. The system processes radar data out to twice the selected range to provide full display coverage in the offset mode.

System Features

Radar

- Multi-mode Operation
 - Surface Search
 - Terrain Mapping
 - Weather Avoidance
 - Lightweight
 - High Reliability

Situation Display

- Aircraft Heading Reference
- Fixed Ground Reference (True Motion)
- Variable Display Offset
- Target Marker: range/bearing or latitude/longitude
- Beacon Location and Identification
- Navigation Waypoint Overlay
- Search Pattern Display

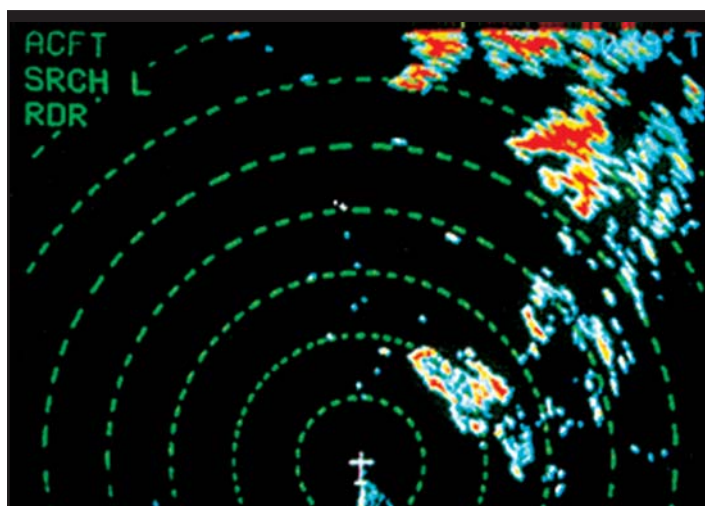
Improved Human Engineering Features

- New Target Marker Logic
- Improved Accuracy

- Target to Center Offset Mode
- Ground Track Line Display
- Range Ring On/Off Capability

Optional Features

- Navigation Interfaces
 - VOR/DME
 - Area NAV
 - Inertial Navigation
 - VLF/Omega
 - Decca Hyperbolic
 - Loran C
 - Doppler
 - GPS
 - LLLTV/Video Interface
 - FLIR Interface with FLIR Sensor Aiming Capability
 - Multi-function Color Indicators: 8.5 in x 9.5 in/5 in x 6 in
 - NVIS-A compatibility
- ### Interface Capabilities
- ARINC 419, ARINC 429
 - Analog ARINC 407, XYZ, SIN COS



Offset Mode

System Specifications

- TSO Compliance: C63b
- Ranges: 0.625 nm
1.25 nm
2.5 nm
5.0 nm
10.0 nm
20.0 nm
40.0 nm
80.0 nm
160.0 nm
- Transmitter Frequency: 9375 MHz
- Transmitter Power Output: 10 KW nominal
- Pulse Repetition Frequency: 1600/800/200 Hz
- Pulse Width: 0.1/0.5/2.35 usec
- Receiver Frequency (Search/Weather Modes): 9375 MHz
- Receiver Frequency (Beacon Mode): 9310 MHz
- Antenna

	<u>Gain</u>	<u>Az Beam Width</u>
(39x9 Array)	31.5 dBi	2.6°
(33x9 Array)	31.0 dBi	3.2°
(29x9 Array)	30.5 dBi	3.4°

- Elevation Beam Width: 10.5°
- Scan Angle: 360° or 120° sector scan
- Scan Rate: 45°/sec - 90°/sec
28°/sec (120° sector scan)

Temperature

- Receiver/Transmitter: -40° to +55°C
- Interface Unit: -15° to +55°C

Power Requirements

- 28 VDC @ 6 amps
- 115 VAC/400 Hz @ 35 Voltamp

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