

SECTION 7
DESCRIPTION AND OPERATIONS

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WEATHER RADAR

General

The Eclipse 500 Weather Radar System (JMA-500) consists of an antenna, pointing control motors, transmitter, receiver, and signal processing electronics. The system interfaces directly with the PFDs for system control and radar information display.

The Weather Radar System provides pilots with local weather to aid in avoiding thunderstorms and associated turbulence. It is not designed for use as a terrain or collision avoidance system.

The weather radar system provides the following features:

- Transmission of radar signals and detection and classification of radar returns from precipitation including rain, snow, hail, and ice.
- Signal processing to characterize intensity of precipitation.
- Display of weather information.
- Built-in testing to identify fault conditions and annunciation messages.
- Pilot interface functions to control tilt, operation modes, gain, and range.
- Automatic stabilization of the radar antenna to maintain a constant scan relative to the horizon during moderate aircraft maneuvers.

Controls and Indication

The Weather Radar Control Buttons and Knobs are the same on Both Left and Right PFDs.



Figure 7-1. Weather Radar Controls (Test Pattern)

Overlay Control Button

Push the Overlay Control Button to step through the choices for the following HIS display screen overlays:

- OFF
- Weather Radar
- TAWS
- TCAS

View/Range Button

Push the RANGE button to activate range from the view mode. Once activated, each push toggles between Circular and Sector Modes:

- VIEW
- RANGE
 - Range in Circular Mode
 - Range in Sector Mode

Range Control - Left Inner Knob

With RANGE activated, rotate the Left Inner Knob clockwise to increase, or counter clockwise to decrease the range to 10, 20, 40, 80, 160, or 240 NM.

The selected range is displayed in the upper right corner, and the range ring distance is displayed along the right edge of the display.

Gain Control - Right Outer Knob

On WxR tab page, with Weather Radar ON and selected to MAP Mode, rotate the Right Outer Knob clockwise to decrease, and counter-clockwise to increase, the Gain between 0dB and -20dB.

Tilt Control - Right Inner Knob

On WxR tab page, with Weather Radar ON, rotate the Right Inner Knob clockwise to increase, and counter-clockwise to decrease, the tilt range between -15 degrees to +15 degrees.

The tilt angle is displayed in the upper right corner.

Tab Select Knob

Rotate the Tab-Control Knob clockwise to select the next tab to the right, or counter-clockwise to select the next tab to the left. Possible tabs are:

- COM
- NAV
- XPDR
- WxR

Mode Button

On WxR tab page, use the Mode Button to step through the following mode selections:

- WX – Weather Mode
- WXA – Weather Alert Mode (Magenta areas will flash)
- MAP – Ground Map Mode (Gain can be controlled)

Function Button

On WxR tab page, use the Function Button to step through the following function selections:

- **OFF** – The radar remains active with no radar transmission.
- **STBY** – Fully energized system circuits, but no Radar Transmission. Antenna is parked at 0 degrees azimuth and 30 degrees tilt down with the antenna drive motors locked.
- **TEST** – Radar does not Transmit and a multicolor Test Pattern is displayed.
- **ON** – Radar Transmits after a 90 second warm-up; normal operations and Weather is displayed with initial 80 NM range.



Figure 7-2. Weather Radar Indications (WX Mode)

Mode Color Indications

WX Colors:

- Black – No Returns
- Green – Weak Returns
- Yellow – Moderate Returns
- Red – Heavy Returns
- Magenta – Intense Returns

WxA Colors:

Colors are the same as Wx except Intense areas of storms flash between magenta and black at a 1 HZ rate.

Map Colors:

- Green – Weak Returns
- Yellow – Moderate Returns
- Magenta – Intense Returns

Crew Alerting System Messages

Message	Condition	Category
RADAR FAIL	Failure of Transmitter, Receiver, or Antenna Control	Caution
RADAR CONTROL	Loss of link between L or R PFD and Weather Radar.	Caution
RADAR NO DATA	With WxR in any mode but OFF, and data is lost between L or R PFD and Weather Radar.	Caution
STAB OFF	Loss of stabilization data or stabilization commanded OFF.	Advisory
STAB LIMIT	Stabilization has reached it's limit.	Status
RANGE DISAGREE	Range and HIS disagree.	Caution
MODE DISAGREE	After 10 seconds, reported function & mode does not match.	Caution
RAD TGT	Detected weather beyond range selected	Advisory

Figure 7-3. CAS Messages