

MOONEY AIRCRAFT CORPORATION
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FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR
MOONEY MODELS M20J and M20K
WITH
SPERRY WEATHER SCOUT COLOR RADAR
MODEL DI-1007 (MI585438)

MOD. NO. _____

REG. NO. _____

SER. NO. _____

This supplement must be attached to the applicable FAA Airplane Flight Manual when the Sperry Weather Scout Radar System Model DI-1007 has been installed in accordance with Mooney Drawing No. 810409. The information contained herein supplements or supersedes the basic manual only in those areas listed herein. For limitations, procedures and performance information not contained in the supplement, consult the basic Airplane Flight Manual.

FAA APPROVED:

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REV. A 12-4-86

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LOG OF REVISIONS

Revision Number	Revised Pages	Description of Revision	FAA Approved*	Date
A	4	Added Max. operating altitude limitations FL 200 (20,000 FT MSL)	<i>C. L. Stone</i>	12-4-86

The revised portions of affected pages are indicated by vertical black lines in the margin.

*Don P. Watson, Manager, Airplane Certification Division

SECTION I - GENERAL

The Weather Scout System is an alphanumeric digital weather radar system which detects storms along the flight path and gives the pilot a 4-color visual display of their intensity. Areas of heaviest rainfall (level 3) will be red; areas of less severe and moderate rainfall (levels 2) yellow, and 1 (green) will be progressively less bright; and no rainfall (level 0) will be black. The radar system performs only the function of weather detection and should not be used, nor relied upon, for proximity warning or anticollision protections.

The system consists of two units: a Receiver-Transmitter-Antenna (RTA), and a Digital Indicator (DI). The RTA is a RTA-1001 which is designed for wing leading edge mounting. The DI is mounted in the cockpit and contains all the controls used to operate the radar. Range and mode alphanumeric displays are always displayed on the 4.6 inch rectangular cathode-ray tube to facilitate evaluation of the weather display.

CONTROLS AND INDICATORS

All controls used to operate the radar system are located on the Indicator front panel. These controls and the display features are indexed and identified in Figure 1 and described in the following Table.

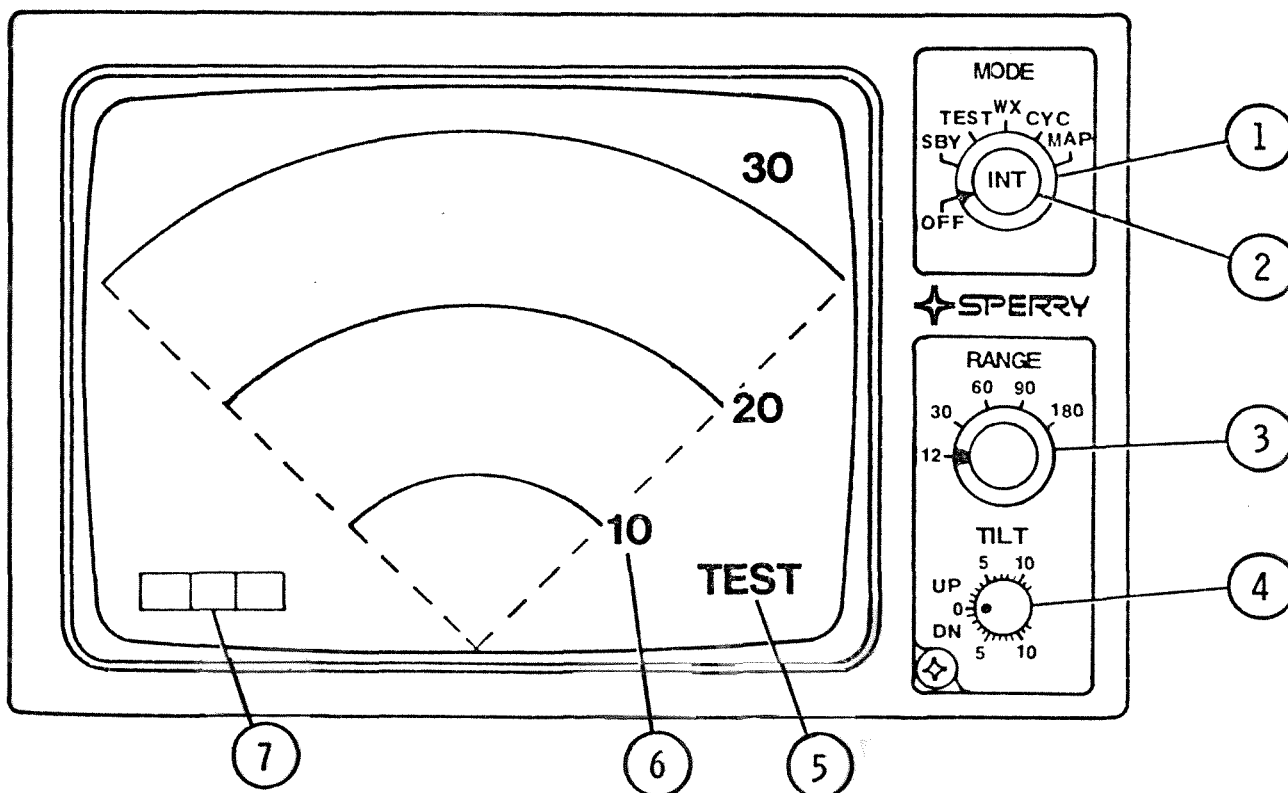


Figure 1 - Indicator Controls and Display Features

Sperry Weather Scout Color Radar (Cont.)

- ① MODE Rotary switch used to select OFF or one of five operating modes:
- o SBY Standby function. Antenna scans but transmitter does not transmit. STBY displayed.
 - o TEST Special test pattern is displayed in all ranges. Antenna scans but transmitter does not transmit. TEST displayed.
 - o WX Weather detection function. WX displayed.
 - o CYC Cyclic weather detection function. Red areas in display flash on and off at 1/2 second intervals. CYC displayed.
 - o MAP Ground mapping function. MAP displayed.
- ② INT Rotary control used to adjust brightness of display. Full CCW rotation reduces intensity to zero (Dark screen).
- ③ RANGE Rotary switch used to select desired range: 12/30/60/90.
- ④ TILT Rotary control that enables pilot to select angle of antenna beam tilt with relation to airframe. CW rotation tilts beam upward 0 to 12 degrees; CCW rotation tilts beam downward 0 to 12 degrees.
- ⑤ Mode Field Selected mode is displayed as STBY, TEST, WX, CYC, or MAP.
- WAIT is displayed during warm-up period or if Indicator is synchronizing with Antenna.
- ⑥ Range Marks Three labeled range marks are displayed for each range. Range marks and alphanumeric are displayed in cyan for WX, CYC, and TEST; in green for MAP.
- ⑦ Test Fields Test block displays three color levels: green/yellow/red for WX, CYC, and TEST; cyan/yellow/magenta for MAP.

Sperry Weather Scout Color Radar (Cont.)

1. After an internal 30-40 second time delay is satisfied and system displays WX an additional 4.5 min. \pm 1 min. delay will incur before unit will transmit RF or antenna scan and tilt will function.

The purpose of this delay is to allow the RTA cavity to purge itself of any possible fuel fumes in the wing area. To accomplish this the aircraft engine must be running and pressure differential switch satisfied with 2 PSI in cavity area.

SECTION II - LIMITATIONS

1. Radar should be operated on the ground only by qualified personnel.
2. Radar should not be operated while the aircraft is in a hanger or other enclosure unless the transmitter is de-activated or the energy is directed into an absorption shield.
3. Do not operate radar when personnel are within a three (3) foot (0.9 meters) radius of the radome.
4. Do not operate radar while the aircraft is being fueled or de-fueled.
5. Personnel operating the radar should familiarize themselves with Advisory Circulars 20-68A and 00-24A.

6. Placard :
Location: TOP of
Instrument
Panel.

PRECAUTIONS FOR RADAR OPERATION

1. POINT ANTENNA TOWARD AREA THAT IS FREE OF LARGE METALLIC OBJECTS FOR 100 YARDS (90 METERS) AND TILT ANTENNA UPWARDS.
2. DO NOT OPERATE WITHIN 100 YARDS (90 METERS) OF ANY REFUELING OPERATIONS.
3. PREVENT PERSONNEL FROM STANDING WITHIN ONE YARD (0.9 METERS) OF ANTENNA.
4. DO NOT OPERATE RADAR AT ALTITUDES ABOVE 20,000 FT. MSL

SECTION III - EMERGENCY PROCEDURES

No Change.

SECTION IV - NORMAL PROCEDURES4.1 OPERATION4.1.1 Preliminary Control Settings

Place the Indicator controls in the following positions before applying power from the aircraft electrical system:

MODE control.....Fully counterclockwise, in OFF
INTensity control...Mid-Point
TILT control.....Fully Upward
RANGE switch.....12 nautical miles

Sperry Weather Scout Color Radar (Cont.)

4.1.2 Precautions

1. Direct nose of aircraft such that antenna scan sector is free of large metallic objects (hangars, other aircraft) for a distance of 100 feet (30 meters), and tilt antenna fully upward.
2. Avoid operation during refueling of aircraft or during refueling operations within 100 feet (30 meters).
3. Prevent personnel from standing too close to radiating antenna (see paragraph D in Section 1, Maximum Permissible Exposure Level).

4.1.3 Operational Control Settings

1. Rotate MODE control to TEST.
2. Note that WAIT is displayed during warm-up period of 30-40 seconds.

NOTE: RTA-1001 has a 2.0 minute time delay from engine turn-on, during which time the modulator and antenna scan are inhibited. No targets will appear until this time delay is over, even though WAIT will disappear from the screen. RTA-1001 units (MI-585255) also have an airflow interlock switch which inhibits the modulator and antenna scan if there is insufficient airflow to the RTA compartment.

3. After warm-up, note that TEST and test pattern are displayed.
4. Adjust INTensity control for desired display brightness.
5. Set MODE control to desired function (WX, CYC, or MAP).
6. Set RANGE switch to desired range and adjust TILT control for desired forward scan area.

4.2 WEATHER DETECTION

The weather (WX) mode is normally selected for weather detection. The cyclic (CYC) mode can be used to highlight intense areas of rainfall after the weather target has been located. When CYC mode is selected, the three level (red) will flash on and off to alert the pilot of the most intense areas of rainfall.

Sperry Weather Scout Color Radar (Cont.)

Experience will soon enable the pilot to detect and evaluate the various types of storm displays. To avoid turbulent weather, the pilot should evaluate the storm display and then determine the approximate heading change required to bypass the storm, or to navigate between storm cells. After the aircraft has been established on its new heading, the pilot should monitor the radar display to see if further correction is needed.

4.3 WARNINGMAXIMUM PERMISSIBLE EXPOSURE LEVEL (MPEL)

Heating and radiation effects of weather radar can be hazardous to life. Personnel should remain a distance greater than 3 ft. radius from the radiating antenna in order to be outside of the envelope in which radiation exposure levels equal or exceed 10 mW/cm^2 , the limit recommended in FAA Advisory Circular AC No. 20-68B (8-8-80), Subject: "Recommended Radiation Safety Precautions for Airborne Weather Radar". The distance of the MPEL boundary is calculated for the radar system on basis of radiator diameter, rated peak-power output, and duty cycle. These are far-field distance calculations, based on the recommendations outlined in AC No. 20-68B.

SECTION V - PERFORMANCE

For the M20J, there is no change in performance.

For the M20K, during a climb above critical altitude, raise climb speed to 105 MPH IAS to ensure adequate engine cooling (this will result in a loss of 45 FPM in climb performance above critical altitude).

SECTION VI thru X

No change.

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