

MONROY AEROSPACE CORP.
Coral Springs, FL USA

FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR
MOONEY MODELS M-20 C-M

Reg. No. N7776N

Ser. No. 28-5224

This Airplane Flight Manual Supplement (AFMS) must be attached to the appropriate FAA Approved Airplane Flight Manual (AFM) or Pilot's Operating Handbook (POH) when the Monroy ATD-200 Air Traffic Detector has been installed in accordance with STC No. SA02491AT.

The information contained herein supplements the information of the basic Airplane Flight Manual only in those areas listed. For limitations, procedures and performance information not contained in this Supplement consult the basic POH/AFM.

FAA Approved: *Robert Applegate*
for
Manager
Aircraft Certification Office
Federal Aviation Administration
Atlanta, Georgia

Date: APR 9 2002

1.0 GENERAL

The ATD-200 Air Traffic Detector is a passive receiver capable of detecting transponder replies from nearby aircraft and displaying their proximity in a graphical display. It also provides distinctive voice warnings in relation to traffic proximity. The system consists of the receiver/indicator unit, antenna, speaker or A/C audio system. The receiver is housed in a small aluminum box (2.75" x 0.75" x 5.0") for easy location in the cockpit.

The ATD-200 has a detection range of 5 nautical miles (NM) for light aircraft and up to 6 NM for air transport aircraft. This range variation is due to the transponder types installed in these aircraft. Proximity of the traffic is displayed on a five segments amber LED bar display. When the traffic is at 4 NM one LED segment is lighted. As the traffic gets closer successive segments are lighted up to 0.5 NM or closer when the bar is fully lighted. If the traffic is Mode S equipped the blue MODE S LED will illuminate for every Mode S reply acquired.

Note: The ATD-200 will not detect aircraft that do not have an operating transponder. Mode A/C transponders outside a surveillance environment will not produce replies so they will not be detected by the ATD-200 (however Mode S transponders transmit continuously). **The ATD-200 is not a substitute for continuous traffic surveillance, NOT ALL AIRCRAFT ARE TRANSPONDER EQUIPPED.**

ATD-200 equipped aircraft transponder replies are inhibited from being displayed on the ATD-200 RANGE display. However, the equipped aircraft replies are indicated by the green SUPR LED. The SUPR LED will also indicate when the onboard DME equipment is transmitting.

The ATD-200 provides distinctive voice warnings for traffic at different ranges. When the VOICE switch is set to the FAR position and traffic is at approximately 3 NM and within 2,500 feet of vertical separation or when the second LED turns on, the word "TRAFFIC" will be annunciated. As the traffic gets closer to approximately 1 NM and within 1,500 feet of vertical separation, four LEDs are illuminated and the voice message changes to "TRAFFIC NEARBY". When the VOICE switch is set to the NEAR position, only traffic at 1 NM or closer will activate the voice warnings. When the VOICE switch is set to MUTE there will be no voice warning messages for any traffic, however traffic proximity will still be displayed on the RANGE display. A screwdriver adjustable volume control is located on the bottom side of the unit. Audio output to a speaker (8 ohms) and headphones (600 ohms) is provided on the rear of the unit.

A test feature verifies transponder and ATD-200 operation. When the test button is pressed, "CHECK TRANSPONDER" will be annunciated to check that the transponder is on and replying. After being depressed for six seconds, "TRAFFIC DETECTOR WORKING" is annunciated and the display bar will fully illuminate. In addition, the SUPR LED will turn off when depressed. The second message will not occur if the transponder is not replying (due to not receiving ATC interrogations) or is malfunctioning.

The right DIM switch turns the unit on/off and adjusts the display brightness for day (HI) or night (LOW) operation.

2.0 LIMITATIONS

The ATD-200 will not detect aircraft that do not have an operating transponder.

Caution: Mode A/C transponders (ATCRBS) outside a radar or TCAS surveillance environment will not produce replies so they will not be detected by the ATD-200 (however Mode S transponders transmit continuously).

Warning: The ATD-200 may not provide traffic alerts when operating within 500 feet of some radio towers.

WARNING: No evasive maneuvers on traffic indication without visual contact of traffic.

The ATD-200 is not a substitute for continuous traffic surveillance. **NOT ALL AIRCRAFT ARE TRANSPONDER EQUIPPED.**

3.0 EMERGENCY PROCEDURES

NONE.

4.0 NORMAL PROCEDURES

4.1 Ground Check

- a) Turn the ATD-200 on by moving the DIM switch to HI (daytime) or LO (nighttime). Verify the ON LED is illuminated.
- b) Set the onboard transponder to reply. Check that the transponder reply light is blinking continuously.
- c) Set the VOICE switch to FAR and press the TEST button for six seconds. The reply "CHECK TRANSPONDER" should be heard. If the transponder is actively replying, the words "TRAFFIC DETECTOR WORKING" should be heard. At some locations the transponder may not reply due to out of coverage at ground level. Test the system again when airborne.

4.2 Taxiing and Pattern

- a) Set the VOICE switch to NEAR for traffic in the pattern. If there is traffic, it will be indicated by the RANGE display. Verify voice warnings for nearby traffic.
- b) At airports with high traffic activity, it may be desirable to set the VOICE switch to MUTE until the area is cleared. Note: remember to reset the VOICE switch to NEAR or FAR after the area is cleared.

4.3 Enroute

The ATD-200 detection range is designed for traffic within 1,500 feet of vertical separation. Traffic flying over or under 3,000 feet vertical separation or more will not provide traffic alerts.

- a) In general, if cruising below 5,000 feet AGL set the VOICE switch to NEAR unless flying over remote or oceanic regions. This will reduce annoying alarms from low traffic or traffic at nearby airports.
- b) If cruising above 10,000 feet set the VOICE switch to FAR. This will provide alerts for traffic that is not yet visible. This will provide an early warning at farther distances due to higher closing speeds.
- c) When alerted for traffic, first look forward and then scan from side to side. If the traffic range indication is closing fast, it is most likely an indication of forward traffic. If the traffic range has a slow change, it is most likely traffic from the side or rear.
- d) Most GA traffic is not visible beyond 2 NM and will not be visible when two RANGE LEDs are on. Turn on landing and strobe lights to enhance visibility of your aircraft. Maintain vigilance of the forward sector while looking for traffic.

- e) **WARNING:** When traffic is alerted, do not perform any evasive maneuvers unless visual contact is established. TCAS II equipped traffic may have already indicated an evasive maneuver to the traffic's crew that may be in conflict with any evasive actions.

5.0 PERFORMANCE

NO CHANGE.

6.0 WEIGHT AND BALANCE

As indicated on the aircraft records.

7.0 SYSTEM DESCRIPTION

Operation of the ATD-200 is simple and straightforward. The following section describes the display and control functions.



DIM switch: Powers the unit and controls display brightness.

HI sets the display at high brightness for daytime flight.
LOW sets the display at low brightness for nighttime flight.
OFF turns the unit off.

VOICE switch: Controls the voice alert activation. Messages are provided every ten seconds but more often if there is imminent or multiple threats.

FAR activates all traffic voice messages.
NEAR activates message at 1NM or closer, "TRAFFIC NEARBY" only.
MUTE inhibits all traffic alert messages.

Note: The traffic RANGE display or sensitivity of the unit is not affected by the position of the VOICE switch.

ON LED: Indicates the unit is on and receiving power.

SUPR LED: Indicates when the onboard transponder is transmitting and when the DME is transmitting.

MODE S LED: Indicates when a Mode S transmission has been acquired. All TCAS II equipped traffic is Mode S equipped but not all Mode S traffic is TCAS equipped. Mode S traffic alternates replies in Mode C and Mode S, so the same Mode S traffic may not illuminate the Mode S LED at times.

RANGE LED: Indicates the approximate range of the traffic.
1 LED 5 NM no voice message
2 LED 3 NM and within 2,500ft "TRAFFIC"
3 LED 2 NM "TRAFFIC"
4 LED 1 NM and within 1,500ft "TRAFFIC NEARBY"
5 LED 0.5 NM "TRAFFIC NEARBY"

TEST button: Verifies transponder and ATD-200 operation. When first depressed it will annunciate "CHECK TRANSPONDER". Verify the transponder is on and replying. After several seconds of button depressed and if the transponder is replying, it will annunciate "TRAFFIC DETECTOR WORKING" and the RANGE display will be fully illuminated. The SUPR LED should turn off during the test.

7.1 Specifications

Table with 2 columns: Specification Name and Value. Includes Frequency Coverage (1086 - 1094 MHz), Signal Format (Mode A, C, S), Threshold Level (-60 dBm), Range Accuracy (20% with ext. antenna @ 200w traffic power), Minimum Reply Rate (300 rps), Suppression Range (-20 dBm to +20 dBm), Maximum Signal Input (+23 dBm), Antenna Impedance (50 Ohms), Audio Output Power (2 Watts @ 8 Ohms adjustable), Speaker Output Impedance (8 Ohms), Phone Output Impedance (600 Ohms), Message Repetition Rate (Every 10 Seconds), Supply Voltage (+11 VDC to +30 VDC), Supply Current (0.2 AMP), Operating Temperature (-20 deg C to +55 deg C), Operating Altitude (-1000 feet to 25,000 feet MSL), Enclosure Type (Black extruded aluminum box), Unit Weight (10 Ounces), Unit Dimensions (2.75" W x 0.75" H x 5.0" D), and Installation Depth (6.5 inches).

8.0 SERVICING & MAINTENANCE

There is no serviceable component in this product. The test equipment needed to test it is very specialized and it is not commonly found in an avionics shop. If you encounter difficulties please check the following suggestions:

- 1) If no power (ON LED off), check the circuit breaker or in-line fuse. Check rear connector.
- 2) Turn off the DME and verify that SUPR LED illuminates when the onboard transponder reply light is on. If not, your transponder signal is too weak or it is defective. Retest with another transponder. Note: the test function in most transponders will not activate its transmitter so SUPR LED will not light when the test is enabled. When DME is on it is normal for the SUPR LED to be illuminated continuously.
- 3) If no voice output, verify that the VOICE switch is not in the MUTE position. Verify audio panel configuration. Plug a miniature plug headphone into the back of the unit and press TEST. If message "CHECK TRANSPONDER" is not heard adjust the VOL control on the bottom side of the unit, clockwise rotation increases volume.
- 4) If occasional false alarms occur (sudden 5 LEDs indication) in-flight check the following. Set momentarily the transponder to STBY and see if the alarm goes away. If it does there may be an antenna connection problem or a defective ATD-200. Verify the SUPR LED is illuminated when the transponder is replying. Turn off the strobe lights as some unshielded strobe light wiring may cause spurious emissions that may be visible on a weather lightning scope. Keep in mind that most GA traffic will not be visible during daytime when less than three LEDs are lighted. In addition, ground radar stations employ transponder beacons on the ground (parrots) to check for antenna azimuth and proper radar operation. When flying near one of these beacons you may get traffic warnings but no visible aircraft.
- 5) At times the ATD-200 will show the range of two aircraft in an alternate fashion e.g. four LEDs and then two or one LEDs. This is due to these aircraft being interrogated at different times by the ground station. This is normal and helps to identify if there is more than one threat in the area. At times, traffic's reply rate may be as low as once every six seconds due to radar antenna rotation. This causes the display to go blank temporarily until another reply is detected. Equipped aircraft or traffic maneuvering may cause momentary blockage of the signal at times.
- 6) Warning: When operating close (less than 500 feet horizontal) to TV or cell phone towers, the ATD-200 may be inhibited from detecting traffic in the area.

Supplemental Type Certificate

Number SA02491AT

Monroy Aerospace Corporation
P.O. Box 8217
Coral Springs, FL 33075

This certificate issued to

verify that the change in the type design for the following product with the limitations and conditions change is specified herein meets the airworthiness requirements of Part 23 of the Federal Aviation Regulations.

Original Product Type Description, Number: 2A3

Make: Mooney
Model: M20 C-M

Supplement of Type Design Change Installation of Monroy Aerospace Corporation Air Traffic Detector AID-200 in accordance with Monroy Aerospace Corporation ATD-200 Air Traffic Detector Installation Manual MA202, Rev. 1, dated 11/25/01, or later FAA approved revision.

Limitations and Conditions This approval should not be extended to other aircraft of this model on which other previously approved modifications are incorporated, unless it is determined by the installer that the interrelationship between this change and any other previously approved modifications will produce no adverse effects upon the airworthiness of that airplane. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission. FAA approved Airplane Flight Manual Supplement for Monroy ATD-200 Air Traffic Detector dated April 2002, is a required part of this STC.

This certificate and the supporting data which is the basis for approval shall remain in effect until a subsequent approval is received or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: September 22, 1997

Date received

Date of issuance: April 25, 2002

Date received



By direction of the Administrator

Eugene L. Bollin
Eugene L. Bollin
Associate Manager, ACE-116A
Atlanta Aircraft Certification Office

Any alteration of this certificate is prohibited by a fine of not less than \$1,000, or imprisonment not exceeding 1 year, or both. This certificate may be transferred in accordance with FAR 21.307.