CHAPTER - 34 HIGHLIGHTS
(Summary of Changes)

Revision No. TR34-19 Nov 08/19

TO: HOLDERS OF THE AIRCRAFT MAINTENANCE MANUAL (06-117751)

Pages that have been added or revised are summarized below. Remove and insert the affected pages as listed, and enter the above revision number with issue date into the Record of Revisions sheet.

This Temporary Revision incorporates and supersedes previously released temporary revisions for the chapters listed below.

Do not remove this page. Keep it in place as a record of previous changes.

CH/SE/SU Page Block No.	Description of Change
34-40-50 PgBlk 1 (A)	Description and Operation – Config A. Corrected effectivity.
34-40-50 PgBlk 1 (B)	Description and Operation – Config B. Added configuration B – POST SB 500-31-024.
34-40-50 PgBlk 501 (A)	Adjustment/Test – Config A. Corrected effectivity.
34-40-50 PgBlk 501 (B)	Adjustment/Test – Config B. Added configuration for Stormscope lightning strike test post SB 500-31-024.

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STORMSCOPE - DESCRIPTION AND OPERATION

AMM-34-40-50-081-A-801

1. Introduction

A. The Lightning Detection System (LDS) on the aircraft is referred to by it's trademark name Stormscope®. Stormscope is a passive thunderstorm detection sensor. The sensor maps electrical discharge activity 360 degrees around the aircraft to a distance of 200 nautical miles for display on the GPS 400W display. Refer to Fig. 1.

2. Description

SUBTASK AMM-34-40-50-081-871-001

A. The Stormscope system detects electrical discharges from thunderstorms within a 200 nm (370 kM) radius of the aircraft for display on the pilot (left side) Garmin GPS 400W also referred to as GPS 1. Stormscope has a passive sensor that receives electronic signals through a stormscope antenna. The processor receives electrical discharge information from the antenna, processes it to determine range and azimuth and processes the heading input.

3. Operation

SUBTASK AMM-34-40-50-081-871-002

A. Stormscope provides the following functions:

- Two modes of weather display are available, Strike mode and Cell mode.
- It works on the ground and in air giving the pilot information before take-off and in flight.
- It displays range and azimuth to lightning strikes/lightning cells.
- The antenna detects electrical and magnetic signatures of lightning strikes.
- Operates passively requiring no transmitter.

Stormscope - GPS 400W Display
Figure 1 (Sheet 1 of 1)

STORMSCOPE - DESCRIPTION AND OPERATION

AMM-34-40-50-081-B-801

1. Introduction

A. The Lightning Detection System (LDS) on the aircraft is referred to by it's trademark name Stormscope®. Stormscope is a passive thunderstorm detection sensor. The sensor maps electrical discharge activity 360 degrees around the aircraft to a distance of 200 nautical miles for display on the PFD. Refer to Fig. 1.

2. Description

SUBTASK AMM-34-40-50-081-B-871-001

A. The Stormscope system detects electrical discharges from thunderstorms within a 200 nm (370 kM) radius of the aircraft for display on the PFD. Stormscope has a passive sensor that receives electronic signals through a stormscope antenna. The processor receives electrical discharge information from the antenna, processes it to determine range and azimuth and processes the heading input.

3. Operation

SUBTASK AMM-34-40-50-081-B-871-002

A. Stormscope provides the following functions:

- Two modes of weather display are available, Strike mode and Cell mode.
- It works on the ground and in air giving the pilot information before take-off and in flight.
- It displays range and azimuth to lightning strikes/lightning cells.
- The antenna detects electrical and magnetic signatures of lightning strikes.
- Operates passively requiring no transmitter.

PFD Stormscope Overlay (Cell Mode / Strike Mode)
Figure 1 (Sheet 1 of 1)

STORMSCOPE - ADJUSTMENT/TEST

AMM-34-40-50-071-A-801

1. General

A. This task gives the procedures to perform the Adjustment/Test for the Lightning Detection System (LDS). The LDS on the aircraft is referred to by it's trademark name Stormscope®. The left hand GPS 400W is GPS 1 and right hand is GPS 2. Stormscope is only displayed on the left hand (GPS 1) unit. The Stormscope computer is on the options rack in the maintenance bay. The Stormscope antenna is mounted internally under the upper over fin fairing on top of the horizontal stabilizer.

B. Testing Matrix:

(1) If the 331 DT - Upper Overfin Fairing is not installed, perform SUBTASK AMM-34-40-50-071-A-701-001 .

(2) If the 331 DT - Upper Overfin Fairing is installed, perform SUBTASK AMM-34-40-50-071-A-701-002 .

2. Equipment and Materials

Table 501. Special Tools and Equipment (AMC Automated Procedure):

Name and Part Number
External Battery Pack, (PowerVamp, Model APS1500
WX-PA Portable Analyzer (L3 Com P/N 78-8060-5791-1)

3. Job Set-Up

SUBTASK AMM-34-40-50-071-A-921-001

A. Make aircraft safe for maintenance. Refer to AMM-20-00-01-051-801 – Make Safe For Maintenance.

B. Connect an External Battery Pack to the aircraft EXTERNAL POWER RECEPTACLE and turn on power. Ensure the green EXT POWER light on the IPL is on. But do not turn on aircraft's power. Refer to AMM-24-40-00-051-801 – External Power - Maintenance Practices.

C. Remove (if necessary) 331 DT - Upper Over Fin Fairing. Refer to AMM-55-10-12-001-801 – Overfin Fairing - Removal.

D. Remove 311 AL - Maintenance Bay Panel. Refer to AMM-06-50-00-051-801 – Aircraft Access Panels.

4. Procedure – Upper Over Fin Fairing – NOT INSTALLED –

SUBTASK AMM-34-40-50-071-A-701-001

A. **Test Set-Up**

NOTE: The operator should be familiar with the WX-PA Portable Analyzer Kit.

(1) Make sure that all aircraft power is off.

(2) Attach the WX-PA test set's antenna to the Stormscope antenna.

(a) Position the WX-PA antenna on the Stormscope antenna as shown in Fig. 501.

- If necessary, use tape to secure WX-PA antenna; see Fig. 502.

(b) Be sure to align the forwards arrows and position the WX-PA antenna suction cups forward of center along the longitudinal axis.

(c) Attach antenna cable grounding clip to nearby structure to obtain a good ground. See also Fig. 503.

(3) Route the WX-PA antenna cable away from the aircraft.

(a) Connect the antenna cable to the WX-PA test box.

(b) DO NOT POWER UP THE TEST SET.

(4) On the IPL, set the SYS BATT and START BATT Switches to the ON (up) position and BUS TIE to AUTO (up) position.

(a) Clear any "MASTER CAUTIONS" and "MASTER WARNINGS" as needed.

(b) On the MFD, press the PROCEED Line Select Key (LSK).

(5) If the aircraft is in the W-off-W condition, the following ECB's must be collared:

CAUTION: IF THE PITOT/STATIC HEAT ECB'S ARE NOT COLLARED OFF, HARM TO PERSONNEL OR AIR DATA TEST EQUIPMENT CAN OCCUR.

(a) On the MFD ECB Page, scroll to ICE PROT and COLLAR the following ECBs:

- ECB - DEICE MANIFOLD HTR (R AFT Bus)
- ECB - L PITOT HEAT (L FWD Bus)
- ECB - R PITOT HEAT (R FWD Bus)
- ECB - L STATIC HEAT (BATT Bus)
- ECB - L STATIC HEAT (R FWD Bus)
- ECB - R STATIC HEAT (R FWD Bus)
- ECB - R STATIC HEAT (L FWD Bus)
- ECB - STBY PITOT HEAT (BATT Bus)
- ECB - L WINDSHIELD HEAT (L AFT Bus)
- ECB - R WINDSHIELD HEAT (R AFT Bus)

(6) On the MFD ECB AVIONICS synoptic page, ensure the following ECB is AUTO-ON:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(7) On the MFD ECB AVIONICS synoptic page, PULL the following ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(8) Turn on the left Garmin 400W and allow it to initialize:

(a) On the left Garmin 400W, turn the small upper left knob clockwise until it “clicks”, to turn the left Garmin 400W on.

- After a short time period, the left Garmin 400W will display a features and status page, and will prompt a flashing “OK?”.

(b) Press the ENT button.

NOTE: Wait until the satellite acquisition page has transitioned to the NAV page before proceeding.

- The left Garmin 400W will then display the INSTRUMENT PANEL SELF-TEST page, and will prompt a flashing “OK?”.

(c) Press the ENT button.

- The left Garmin 400W will then display the satellite acquisition page and/or the NAV page.

(9) On the left Garmin 400W, scroll the small inner knob (lower right corner) clockwise to select Lightning Detection (Stormscope) for display on the left Garmin 400W unit (“LTNG” page).

NOTE: Left Garmin 400W “LTNG” page will display “LIGHTNING FAILED”.

(10) On the MFD ECB AVIONICS synoptic page, reset the following ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(11) Make sure that no self-test failure messages appear.

(12) Stormscope is now powered up and initialized.

(a) Make sure that no self-test failure messages appear.

(13) Make sure “LIGHTNING FAIL” annunciation on the GPS 400W extinguishes 10-20 seconds after ECB - LIGHTNING DETECT SYS (R AFT Bus) is RESET.

NOTE: The left Garmin display will annunciate “TEST” in the upper right corner for 10-20 seconds after the “LIGHTNING FAIL” annunciation extinguishes, indicating that the Stormscope computer is in self-test. The “TEST” annunciation will then change to “RATE”, unless a Stormscope self-test failure occurs. If a selftest failure occurs during initialization, determine the nature of the test failure prior to continuing with this test procedure.

B. **Initial System Test**

Refer to Fig. 504

(1) On the left Garmin 400W, select the 360° display mode (if not already in 360° mode) and verify proper 360° display format on the left Garmin 400W unit.

(a) If not already in 360° mode, on left Garmin 400W:

1 Press MENU button.

2 Use outer knob (lower right corner) to scroll down to “View 360?”.

3 Press the ENT button.

(2) On left Garmin 400W, select STRIKE mode (if not already in STRIKE mode). Verify STRIKE MODE is displayed on the left Garmin 400W Lightning display format.

(a) If not already in STRIKE mode, on left Garmin 400W:

1 Press MENU button.

2 Use outer knob (lower right corner) to scroll down to “Strike Mode?”.

3 Press the ENT button.

(3) On left Garmin 400W, set range to 100 NM (if not already set to 100 NM).

NOTE: Outer ring shows “100 nm”, Inner ring shows “50 nm”.

(a) If not already set to 100 NM, on left Garmin 400W:

1 Press RNG button on right end (▲) to increase range.

2 Press RNG button on left end (▼) to decrease range.

(4) Make sure Strike RATE counter is displayed in STRIKE mode.

NOTE: Strike RATE counter should be displaying 0, unless there is real thunderstorm activity within detection range (nearby man-made electrical noise such as a blower motor or electric drill can also cause strike data to appear). If so, the test strike data in the following steps will be displayed along with real storm strike data (or man-made electrical strike data).

(5) Tune the VHF 1 COMM radio to a test frequency.

(6) Key the VHF 1 Comm mic (transmit on VHF 1 Comm) repeatedly.

(a) Make sure no strike data appears on the GPS 400W Lightning display as a result of keying the VHF 1 transmitter.

(7) Tune the VHF 2 COMM radio to a test frequency.

(a) Select COM 2 as the ACTIVE radio.

(8) Key the VHF 2 Comm mic (transmit on VHF 2 Comm) repeatedly.

(a) Make sure no strike data appears on the GPS 400W Lightning display as a result of keying the VHF 2 transmitter.

(9) Verify aircraft is positioned so that it can be freely turned 45° (± 5°) clockwise (to the right).

(a) Make sure area around aircraft is clear.

(b) Make sure that WX-PA tester can be moved with the aircraft.

(c) Make sure adequate cable is deployed from the external power cart to allow the aircraft to turn 45° to the right.

(10) Power up the WX-PA Portable Analyzer unit.

- After the WX-PA completes self-test, the MODE MENU will be displayed.

(11) On the WX-PA, select “Continuous Out” on the MODE MENU, then press the MENU/ENTR button once (so that WX-PA indicates “PAUSED” and not “RUNNING”).

(12) On the WX-PA, press the FLAPS/A button to select top mount antenna configuration.

(13) On the WX-PA, select a cardinal bearing of 0° and a range of 55 NM.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(14) On the WX-PA, with “Continuous Out” still selected on the MODE MENU, push the MENU/ENTR button once so that the WX-PA indication changes from “PAUSED” to “RUNNING”.

C. **Cardinal Bearings Test**

(1) On the LH Garmin 400W, press the MENU button. Highlight CLEAR STORM DATA? (if not already highlighted), then press the ENT button.

(2) Verify that the Strike Rate is displayed on the Garmin 400W as shown in Fig. 504.

(a) When Strike Rate reaches approximately 580+/-40 strikes per minute, verify that the strikes appear within the required bearing limits for each of the settings on the WX-PA as shown in Table 502.

NOTE: Strikes may appear approximately at half of the range selected.

NOTE: Clear the storm data from the Garmin 400W after each test.

(3) On the WX-PA, push 2nd, then push MENU/ENTR to return to Main Menu.

Table 502. Cardinal Bearings Tests

TEST - 1 • Set WX-PA range = 55 NM • Set Garmin 400W range = 150 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 2 • Set WX-PA range = 30 NM • Set Garmin 400W range = 100 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 3 • Set WX-PA range = 15 NM • Set Garmin 400W range = 50 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	

D. **Heading Input Check**

(1) On the WX-PA, select “Continuous Out” on the MODE MENU, then press the MENU/ENTR button once (so that WX-PA indicates “PAUSED” and not “RUNNING”).

(2) On the WX-PA, press the FLAPS/A button to select top mount antenna configuration (if not already selected).

(3) On the WX-PA, select a cardinal bearing of 180° and a range of 75 NM.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(4) On the WX-PA, with “Continuous Out” still selected on the MODE MENU, press the MENU/ENTR button once so that WX-PA indication changes from “PAUSED” to “RUNNING”.

(5) On the left hand GPS 400W (GPS 1), push the MENU button. Highlight CLEAR STORM DATA? (if not already highlighted), then push the ENT button.

NOTE: Strike RATE will recede then ramp up toward 600 ± 200 strikes per minute again.

(6) Observe the GPS 400W Lightning display to ensure proper positioning of the test strikes, based on range and bearing settings on the WX-PA.

(a) Make sure that test strikes appearing on the GPS 400W Lightning display are plotted at 180 ± 10° and approximately 75 NM.

(7) Make sure that the Strike RATE counter is strikes (600 ± 200 strikes per minute).

(8) With aircraft magnetic heading active, turn the aircraft 45 ±5° to the right.

(9) Make sure that previously plotted discharge points move approximately 45° counterclockwise (approximately 135° relative on the GPS 400W display).

5. Procedure – Upper Over Fin Fairing – INSTALLED –

SUBTASK AMM-34-40-50-071-A-701-002

A. **Test Set-Up**

NOTE: With the WX-PA antenna placed on top of the fin fairing cap (over the Stormscope antenna), the Stormscope unit will plot data on the GPS 400W display at a farther range than the range selected on the WX-PA. This is because of the greater offset distance between the WX-PA antenna and the Stormscope antenna. For example, in the following steps, a test range of 30 NM is selected and the resulting displayed strikes occur at approximately 50 NM.

IMPORTANT! If for any reason the WX-PA tester produces “double image” lightning strikes on the Garmin 400W display, where the programmed strike pattern appears and additional strikes appear on a reciprocal bearing (180° away), then the Upper Over Fin Fairing must be removed and the “Procedure (Upper Over Fin Fairing NOT Installed)” must be performed. Refer to SUBTASK AMM-34-40-50-071-A-701-001.

NOTE: Operator should be familiar with the WX-PA Portable Analyzer Kit.

(1) Make sure that all aircraft power is off.

(2) Attach the WX-PA test set’s antenna on top of the vertical tail fin fairing cap (over the Stormscope antenna).

(a) Position the WX-PA antenna on the fin fairing cap 5.75 inches aft of the top center fastener.

- If necessary, use tape to secure WX-PA antenna to the fin fairing cap; see Fig. 502.

(b) Be sure to align the WX-PA antenna’s arrow pointing forward, centered on the top of the fairing.

(3) Route the WX-PA antenna cable away from the aircraft.

(a) Connect the antenna cable to the WX-PA test box.

(b) DO NOT POWER UP THE TEST SET.

(4) On the IPL set the SYS BATT and START BATT switches to the ON (up) position and BUS TIE to AUTO (up) position.

(a) Clear any “MASTER CAUTIONS” and “MASTER WARNINGS” as needed.

(b) On the MFD, press the PROCEED Line Select Key (LSK).

(5) If the aircraft is in the W-off-W condition, the following ECB's must be collared:

CAUTION: IF THE PITOT/STATIC HEAT ECB'S ARE NOT COLLARED OFF, HARM TO PERSONNEL OR AIR DATA TEST EQUIPMENT CAN OCCUR.

(a) On the MFD ECB Page, scroll to ICE PROT and COLLAR the following ECBs:

- ECB - DEICE MANIFOLD HTR (R AFT Bus)
- ECB - L PITOT HEAT (L FWD Bus)
- ECB - R PITOT HEAT (R FWD Bus)
- ECB - L STATIC HEAT (BATT Bus)
- ECB - L STATIC HEAT (R FWD Bus)
- ECB - R STATIC HEAT (R FWD Bus)
- ECB - R STATIC HEAT (L FWD Bus)
- ECB - STBY PITOT HEAT (BATT Bus)
- ECB - L WINDSHIELD HEAT (L AFT Bus)
- ECB - R WINDSHIELD HEAT (R AFT Bus)

(6) On the MFD ECB AVIONICS synoptic page, ensure the following ECB is AUTO-ON:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(7) On the MFD ECB AVIONICS synoptic page, PULL the following ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(8) Turn on left Garmin 400W and allow it to initialize:

(a) On the left Garmin 400W, turn the small upper left knob clockwise until it "clicks", to turn the left Garmin 400W on.

- After a short time period, the left Garmin 400W will display a features and status page, and will prompt a flashing "OK?".

(b) Press the ENT button.

NOTE: Wait until the satellite acquisition page has transitioned to the NAV page before proceeding.

- The left Garmin 400W will then display the INSTRUMENT PANEL SELF-TEST page, and will prompt a flashing "OK?".

(c) Press the ENT button.

- The left Garmin 400W will then display the satellite acquisition page and/or the NAV page.

(9) On the left Garmin 400W, scroll the small inner knob (lower right corner) clockwise to select Lightning Detection (Stormscope) for display on the left Garmin 400W unit ("LTNG" page).

NOTE: Left Garmin 400W "LTNG" page will display "LIGHTNING FAILED".

(10) On the MFD ECB AVIONICS synoptic page, reset the following ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(11) Make sure that no self-test failure messages appear.

(12) Stormscope is now powered up and initialized.

(a) Make sure that no self-test failure messages appear.

(13) Make sure “LIGHTNING FAIL” annunciation on the GPS 400W extinguishes 10-20 seconds after ECB - LIGHTNING DETECT SYS (R AFT Bus) is RESET.

NOTE: The left Garmin display will annunciate “TEST” in the upper right corner for 10-20 seconds after the “LIGHTNING FAIL” annunciation extinguishes, indicating that the Stormscope computer is in self-test. The “TEST” annunciation will then change to “RATE”, unless a Stormscope self-test failure occurs. If a selftest failure occurs during initialization, determine the nature of the test failure prior to continuing with this test procedure.

B. **Initial System Test**

(1) On the left Garmin 400W, select the 360° display mode (if not already in 360° mode). Verify proper 360° display format on the left Garmin 400W unit.

(a) If not already in 360° mode, on left Garmin 400W:

1 Press MENU button.

2 Use outer knob (lower right corner) to scroll down to “View 360?”.

3 Press the ENT button.

(2) On left Garmin 400W, select STRIKE mode (if not already in STRIKE mode). Verify STRIKE MODE is displayed on the left Garmin 400W Lightning display format.

(a) If not already in STRIKE mode, on left Garmin 400W:

1 Press MENU button.

2 Use outer knob (lower right corner) to scroll down to “Strike Mode?”.

3 Press the ENT button.

(3) On left Garmin 400W, set range to 100 NM (if not already set to 100 NM).

NOTE: Outer ring; inner ring will say “50 nm”.

(a) If not already set to 100 NM, on left Garmin 400W:

1 Press RNG button on right end (▲) to increase range.

2 Press RNG button on left end (▼) to decrease range.

(4) Make sure Strike RATE counter is displayed in STRIKE mode.

NOTE: Strike RATE counter should be displaying 0, unless there is real thunderstorm activity within detection range (nearby man-made electrical noise such as a blower motor or electric drill can also cause strike data to appear). If so, the test strike data in the following steps will be displayed along with real storm strike data (or man-made electrical strike data).

(5) Tune the VHF 1 COMM radio to a test frequency.

(6) Key the VHF 1 Comm mic (transmit on VHF 1 Comm) repeatedly.

(a) Make sure no strike data appears on the GPS 400W Lightning display as a result of keying the VHF 1 transmitter.

(7) Tune the VHF 2 COMM radio to a test frequency.

(a) Select COM 2 as the ACTIVE radio.

(8) Key the VHF 2 Comm mic (transmit on VHF 2 Comm) repeatedly.

(a) Make sure no strike data appears on the GPS 400W Lightning display as a result of keying the VHF 2 transmitter.

(9) Verify aircraft is positioned so that it can be freely turned 45° (± 5°) clockwise (to the right).

Verify aircraft is positioned so that it can be freely turned 45° to the right. Make sure area around aircraft is clear.

(a) Make sure area around aircraft is clear.

(b) Make sure that WX-PA tester can be moved with the aircraft.

(c) Make sure adequate cable is deployed from the external power cart to allow the aircraft to turn 45° to the right.

(10) Power up the WX-PA Portable Analyzer unit.

- After the WX-PA completes self-test, the MODE MENU will be displayed.

(11) On the WX-PA, select “Continuous Out” on the MODE MENU, then push the MENU/ENTR button once (so that WX-PA indicates “PAUSED” and not “RUNNING”).

(12) On the WX-PA, push the FLAPS/A button to select top mount antenna configuration.

(13) On the WX-PA, select a cardinal bearing of 0° and a range of 55 NM.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(14) On the WX-PA, with “Continuous Out” still selected on the MODE MENU, push the MENU/ENTR button once so that the WX-PA indication changes from “PAUSED” to “RUNNING”.

C. **Cardinal Bearings Test**

(1) On the LH Garmin 400W, press the MENU button. Highlight CLEAR STORM DATA? (if not already highlighted), then press the ENT button.

(2) Verify that the Strike Rate is displayed on the Garmin 400W as shown in Fig. 504.

(a) When Strike Rate reaches approximately 580+/-40 strikes per minute, verify that the strikes appear within the required bearing limits for each of the settings on the WX-PA as shown in Table 502.

NOTE: Strikes may appear approximately at half of the range selected.

NOTE: Clear the storm data from the Garmin 400W after each test.

(3) On the WX-PA, push 2nd, then push MENU/ENTR to return to Main Menu.

Table 503. Cardinal Bearings Tests

TEST - 1 • Set WX-PA range = 55 NM • Set Garmin 400W range = 150 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 2 • Set WX-PA range = 30 NM • Set Garmin 400W range = 100 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 3 • Set WX-PA range = 15 NM • Set Garmin 400W range = 50 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	

D. **Heading Input Check**

(1) On the WX-PA, select “Continuous Out” on the MODE MENU, then press the MENU/ENTR button once (so that WX-PA indicates “PAUSED” and not “RUNNING”).

(2) On the WX-PA, press the FLAPS/A button to select top mount antenna configuration (if not already selected).

(3) On the WX-PA, select a cardinal bearing of 180° and a range of 30 NM.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(4) On the WX-PA, with “Continuous Out” still selected on the MODE MENU, then press the MENU/ENTR button once so that WX-PA indication changes from “PAUSED” to “RUNNING”.

(5) On the left hand GPS 400W (GPS 1), push the MENU button. Highlight CLEAR STORM DATA? (if not already highlighted), then push the ENT button.

NOTE: Strike RATE will recede then ramp up toward 600 ± 200 strikes per minute again.

(6) Observe the GPS 400W Lightning display to ensure proper positioning of the test strikes, based on range and bearing settings on the WX-PA.

(a) Make sure that test strikes appearing on the GPS 400W Lightning display are plotted at 180 ± 10° and approximately 50 NM.

(7) Make sure that the Strike RATE counter is strikes (600 ± 200 strikes per minute).

(8) With aircraft magnetic heading active, turn the aircraft 45 ± 5° to the right.

(9) Make sure that previously plotted discharge points move approximately 45° counterclockwise (approximately 135° relative on the GPS 400W display).

6. Job Close-Up

SUBTASK AMM-34-40-50-071-A-921-002

A. If no other work is to be performed, turn off the aircraft power by setting the SYS BATT and START BATT Switches to the OFF (down) position and BUS TIE to OPEN (down) position.

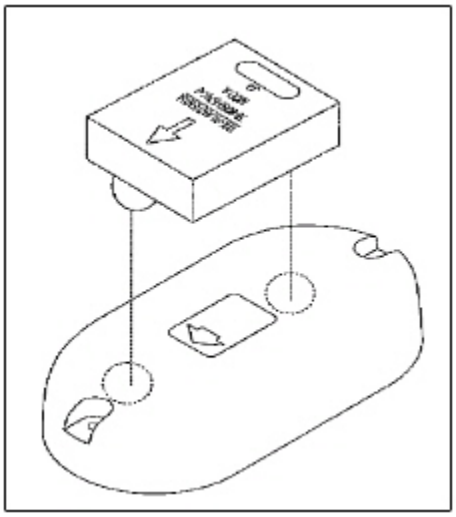
B. If no other requirements for External Power, disconnect External Battery Pack from the aircraft EXTERNAL POWER RECEPTICLE.

C. Install (if removed) 331 DT - Upper Overfin Fairing. Refer to AMM-06-50-00-051-801 – Aircraft Access Panels for location and installation instructions.

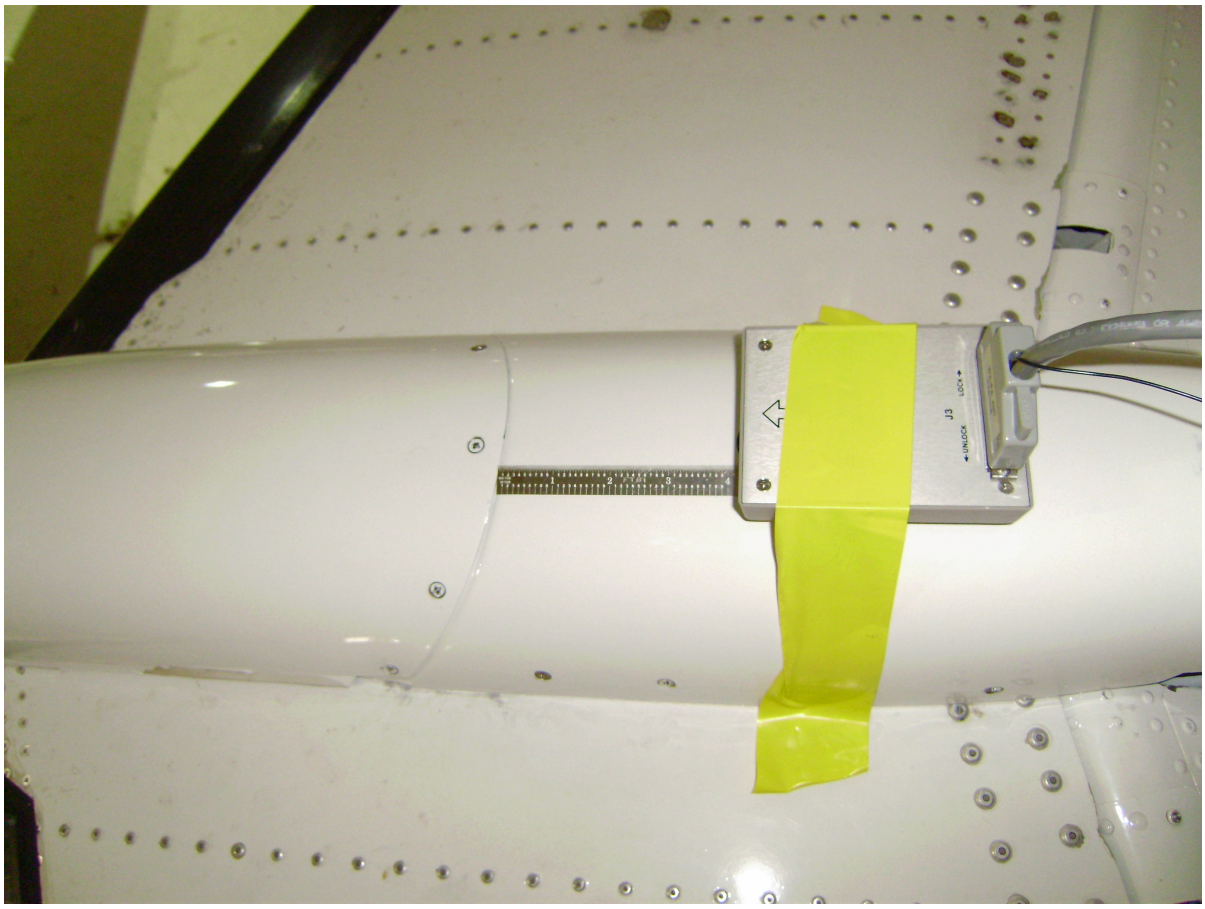
D. Install (if removed) 311 AL - Maintenance Bay Panel. Refer to AMM-06-50-00-051-801 – Aircraft Access Panels for location and installation instructions.

E. Remove all tools, equipment and unwanted material from work area.

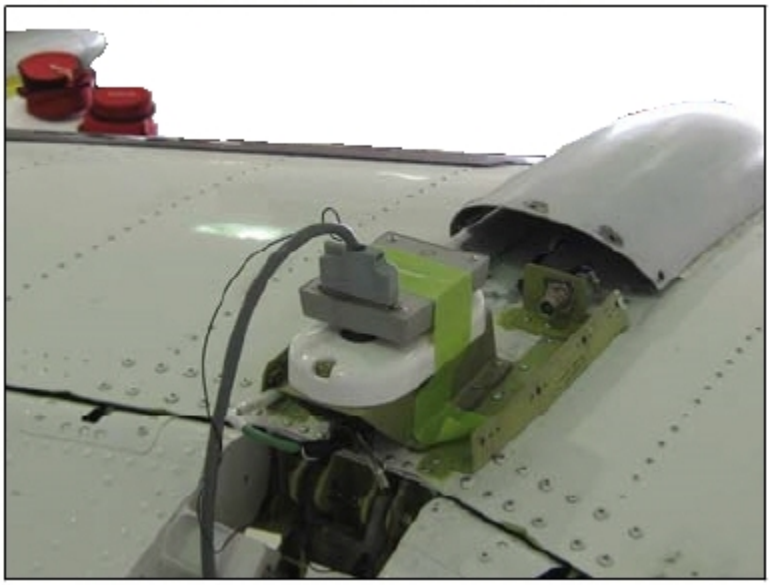
F. If all other maintenance is complete, return aircraft to service. Refer to AMM-20-00-02-051-801 – Return To Service (After Maintenance).



WX-PA Antenna Alignment
Figure 501 (Sheet 1 of 1)



Positioning the WX-PA Antenna on the Over Fin Fairing
Figure 502 (Sheet 1 of 1)



WX-PA Antenna Attachment
Figure 503 (Sheet 1 of 1)

Stormscope — GPS 400W Display
Figure 504 (Sheet 1 of 1)

STORMSCOPE - ADJUSTMENT/TEST

AMM-34-40-50-071-B-801

1. General

A. This task gives the procedures to perform the Adjustment/Test for the Lightning Detection System (LDS). The LDS on the aircraft is referred to by it's trademark name Stormscope®. The Stormscope computer is on the options rack in the maintenance bay. The Stormscope antenna is mounted internally under the upper over fin fairing on top of the horizontal stabilizer.

B. Testing Matrix:

(1) If the 331 DT - Upper Overfin Fairing is removed, perform SUBTASK AMM-34-40-50-071-B-701-001.

(2) If the 331 DT - Upper Overfin Fairing is installed, perform SUBTASK AMM-34-40-50-071-B-701-002.

2. Equipment and Materials

Table 501. Special Tools and Equipment

Name and Part Number
External Battery Pack, (PowerVamp, Model APS1500
WX-PA Portable Analyzer (L3 Com P/N 78-8060-5791-1)

3. Job Set-Up

SUBTASK AMM-34-40-50-071-B-921-001

A. Make aircraft safe for maintenance. Refer to AMM-20-00-01-051-801 – Make Safe For Maintenance.

B. Connect an External Battery Pack to the aircraft EXTERNAL POWER RECEPTACLE and turn on power. Ensure the green EXT POWER light on the IPL is on. But do not turn on aircraft's power. Refer to AMM-24-40-00-051-801 – External Power - Maintenance Practices.

C. Remove (if necessary) 331 DT - Upper Over Fin Fairing. Refer to AMM-55-10-12-001-801 – Overfin Fairing - Removal.

4. Procedure – Upper Over Fin Fairing – NOT INSTALLED –

SUBTASK AMM-34-40-50-071-B-701-001

A. Test Set-Up

(1) Attach the WX-PA test set's antenna to the LDS NY-163 antenna.

(a) Position the WX-PA antenna on the LDS antenna as shown in Fig. 501.

- If necessary, use tape to secure WX-PA antenna; see Fig. 502.

(b) Be sure to align the forwards arrows and position the WX-PA antenna suction cups forward of center along the longitudinal axis.

(c) Attach antenna cable grounding clip to nearby structure to obtain a good ground. See also Fig. 503.

(2) Route the WX-PA antenna cable away from the aircraft.

(a) Connect the antenna cable to the WX-PA test box.

(b) DO NOT POWER UP THE TEST SET.

(3) On the IPL, set the SYS BATT and START BATT Switches to the ON (up) position and BUS TIE to AUTO (up) position.

(a) Clear any "MASTER CAUTIONS" and "MASTER WARNINGS" as needed.

(b) On the MFD, press the PROCEED Line Select Key (LSK).

(4) Verify that no CAS messages are displayed indicating Lightning equipment failures.

(5) On the MFD ECB AVIONICS synoptic page, PULL the ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(6) Verify that a LIGHTNING DETECT FAIL CAS message is displayed.

(7) On the MFD ECB AVIONICS synoptic page, reset the ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(8) On the PFD WXR tab select the CELL option for the Stormscope.

Refer to Fig. 504

(a) Verify that the Strike Rate is displayed on the PFDs ('+' shaped symbols may also be displayed on the HSI, if lightning is present).

(9) Depress the right LSK #4 to set the Stormscope mode to STRIKE.

(a) Verify that the Strike Rate is displayed on the PFDs ('x' shaped symbols may also be displayed on the HSI, if lightning is present).

(10) On either PFD, tune the VHF 1 COMM radio to a test frequency (e.g., 123.450 MHz).

(a) Select COM 1 as the ACTIVE radio (if not already selected).

(11) Key the pilot's Comm mic switch (transmit on VHF 1 Comm) repeatedly.

(a) Verify no strike data appears on the PFDs as a result of keying the VHF 1 transmitter.

(12) On either PFD, tune the VHF 2 COMM radio to a test frequency (e.g., 123.450 MHz).

(a) Select COM 2 as the ACTIVE radio.

(13) Key the co-pilot's Comm mic switch (transmit on VHF 2 Comm) repeatedly.

(a) Verify no strike data appears on the PFDs as a result of keying the VHF 2 transmitter.

(14) Verify aircraft is positioned so that it can be freely turned 45° (± 5°) clockwise (to the right).

(a) Make sure area around aircraft is clear.

(b) Make sure that WX-PA tester can be moved with the aircraft.

(c) Make sure adequate cable is deployed from the external power cart to allow the aircraft to turn 45° to the right.

(15) Power up the WX-PA Portable Analyzer unit.

- After the WX-PA completes self-test, the MODE MENU will be displayed.

(16) On the WX-PA, select "Continuous Out" on the MODE MENU, then press the MENU/ENTR button once (so that WX-PA indicates "PAUSED" and not "RUNNING").

(17) On the WX-PA, press the FLAPS/A button to select top mount antenna configuration.

(18) On the WX-PA, select a cardinal bearing of 0° and a range of 55 NM.
Refer to TEST - 1 in Table 502.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(19) On the WX-PA, with "Continuous Out" still selected on the MODE MENU, press the MENU/ENTR button once so that WX-PA indication changes from "PAUSED" to "RUNNING".

(20) On the PFD, press the STRIKE CLEAR LSK.

- Strike data cleared from PFDs, then begins building again.

(21) Verify that the Strike Rate is displayed on the PFDs.

(a) When Strike Rate reaches approximately 580 ± 40 strikes per minute, verify that the strikes appear within the required bearing limits for each of the settings on the WX-PA as shown in Table 502.

NOTE: Strikes may appear approximately at half of the range selected on the PFD.

NOTE: Press the STRIKE CLEAR LSK after each test.

Table 502. Cardinal Bearings Tests

TEST - 1 • Set WX-PA range = 55 NM • Set PFD range = 160 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 2 • Set WX-PA range = 30 NM • Set PFD range = 80 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 3 • Set WX-PA range = 15 NM • Set PFD range = 40 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	

(22) On the WX-PA, press 2nd, then press MENU/ENTR to return to Main Menu.

(23) On the WX-PA, select “Continuous Out” on the MODE MENU, then press the MENU/ENTR button once (so that WX-PA indicates “PAUSED” and not “RUNNING”).

(24) On the WX-PA, press the FLAPS/A button to select top mount antenna configuration (if not already selected).

- WX-PA displays “Top Mnt”.

(25) On the WX-PA, select a cardinal bearing of 180° and a range of 75 NM.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(26) On the WX-PA, with “Continuous Out” still selected on the MODE MENU, press the MENU/ENTR button once so that WX-PA indication changes from “PAUSED” to “RUNNING”.

(27) On the PFD, press the STRIKE CLEAR LSK.

- Strike data cleared from PFDs, then begins building again.

(28) Verify that the Strike Rate is displayed on the PFDs.

- Strike RATE will show 600 ± 200 strikes per minute.

(29) Test strikes appearing on the PFDs are at approximately 180 ± 10° relative and 75 NM.

(30) With aircraft magnetic heading active, turn the aircraft 45 ± 5° clockwise, or to the right.

(31) Older test strikes on PFDs are at approximately 135 ± 30° relative and 75 NM. Newer strikes displaying at approximately 180 ± 10° relative and 75 NM. Each newer test strike during the turn forms part of an approximately 45° “arc” pattern, from approximately 135° relative to approximately 180° relative.

(32) Power down the WX-PA Portable Analyzer unit and remove WX-PA test set and antenna from aircraft.

(33) If no other work is to be performed, turn OFF the aircraft power by setting the SYS BATT and START BATT Switches to the OFF (down) position and BUS TIE to OPEN (down) position.

(34) Install 331 DT - Upper Over Fin Fairing. Refer to AMM-55-10-12-041-801 – Overfin Fairing - Installation.

5. Procedure – Upper Over Fin Fairing – INSTALLED –

SUBTASK AMM-34-40-50-071-B-701-002

A. Test Set-Up

IMPORTANT!
If for any reason the WX-PA tester produces "double image" lightning strikes on the PFD display, where the programmed strike pattern appears and additional strikes appear on a reciprocal bearing (180° away), then the Upper Over Fin Fairing must be removed. Refer to SUBTASK AMM-34-40-50-071-B-701-001.

NOTE: The operator should be familiar with the WX-PA Portable Analyzer Kit.

(1) Make sure all aircraft power is off.

(2) Attach the WX-PA test set's antenna to the LDS NY-163 antenna.

(a) Position the WX-PA antenna on the LDS antenna as shown in Fig. 501.

- If necessary, use tape to secure WX-PA antenna; see Fig. 502.

(b) Be sure to align the forwards arrows and position the WX-PA antenna suction cups forward of center along the longitudinal axis.

(c) Attach antenna cable grounding clip to nearby structure to obtain a good ground. See also Fig. 503.

(3) Route the WX-PA antenna cable away from the aircraft.

(a) Connect the antenna cable to the WX-PA test box.

(b) DO NOT POWER UP THE TEST SET.

(4) On the IPL, set the SYS BATT and START BATT Switches to the ON (up) position and BUS TIE to AUTO (up) position.

(a) Clear any "MASTER CAUTIONS" and "MASTER WARNINGS" as needed.

(b) On the MFD, press the PROCEED Line Select Key (LSK).

(5) Verify that no CAS messages are displayed indicating Lightning equipment failures.

(6) On the MFD ECB AVIONICS synoptic page, PULL the ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(7) Verify that a LIGHTNING DETECT FAIL CAS message is displayed.

(8) On the MFD ECB AVIONICS synoptic page, reset the ECB:

- ECB - LIGHTNING DETECT SYS (R AFT Bus)

(9) On the PFD WXR tab select the CELL option for the Stormscope.
Refer to Fig. 504

(a) Verify that the Strike Rate is displayed on the PFDs ('+' shaped symbols may also be displayed on the HSI, if lightning is present).

(10) Depress the right LSK #4 to set the Stormscope mode to STRIKE.

(a) Verify that the Strike Rate is displayed on the PFDs ('x' shaped symbols may also be displayed on the HSI, if lightning is present).

(11) On either PFD, tune the VHF 1 COMM radio to a test frequency (e.g., 123.450 MHz).

(a) Select COM 1 as the ACTIVE radio (if not already selected).

(12) Key the pilot's Comm mic switch (transmit on VHF 1 Comm) repeatedly.

(a) Verify no strike data appears on the PFDs as a result of keying the VHF 1 transmitter.

(13) On either PFD, tune the VHF 2 COMM radio to a test frequency (e.g., 123.450 MHz).

(a) Select COM 2 as the ACTIVE radio.

(14) Key the co-pilot's Comm mic switch (transmit on VHF 2 Comm) repeatedly.

(a) Verify no strike data appears on the PFDs as a result of keying the VHF 2 transmitter.

(15) Verify aircraft is positioned so that it can be freely turned 45° (± 5°) clockwise (to the right).

(a) Make sure area around aircraft is clear.

(b) Make sure that WX-PA tester can be moved with the aircraft.

(c) Make sure adequate cable is deployed from the external power cart to allow the aircraft to turn 45° to the right.

(16) Power up the WX-PA Portable Analyzer unit.

- After the WX-PA completes self-test, the MODE MENU will be displayed.

(17) On the WX-PA, select "Continuous Out" on the MODE MENU, then press the MENU/ENTR button once (so that WX-PA indicates "PAUSED" and not "RUNNING").

(18) On the WX-PA, press the FLAPS/A button to select top mount antenna configuration.

(19) On the WX-PA, select a cardinal bearing of 0° and a range of 55 NM.
Refer to TEST - 1 in Table 503.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(20) On the WX-PA, with "Continuous Out" still selected on the MODE MENU, press the MENU/ENTR button once so that WX-PA indication changes from "PAUSED" to "RUNNING".

(21) On the PFD, press the STRIKE CLEAR LSK.

- Strike data cleared from PFDs, then begins building again.

(22) Verify that the Strike Rate is displayed on the PFDs.

(a) When Strike Rate reaches approximately 580 ± 40 strikes per minute, verify that the strikes appear within the required bearing limits for each of the settings on the WX-PA as shown in Table 503.

NOTE: Strikes may appear approximately at half of the range selected on the PFD.

NOTE: Press the STRIKE CLEAR LSK after each test.

Table 503. Cardinal Bearings Tests

TEST - 1 • Set WX-PA range = 55 NM • Set PFD range = 160 NM		**Result** (PASS/FAIL)
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Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 2 • Set WX-PA range = 30 NM • Set PFD range = 80 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	
TEST - 3 • Set WX-PA range = 15 NM • Set PFD range = 40 NM		**Result** (PASS/FAIL)
Set WX-PA bearing = 000°	Verify the displayed bearing = 000 ±10°	
Set WX-PA bearing = 090°	Verify the displayed bearing = 090 ±10°	
Set WX-PA bearing = 180°	Verify the displayed bearing = 180 ±10°	
Set WX-PA bearing = 270°	Verify the displayed bearing = 270 ±10°	

(23) On the WX-PA, press 2nd, then press MENU/ENTR to return to Main Menu.

(24) On the WX-PA, select “Continuous Out” on the MODE MENU, then press the MENU/ENTR button once (so that WX-PA indicates “PAUSED” and not “RUNNING”).

(25) On the WX-PA, press the FLAPS/A button to select top mount antenna configuration (if not already selected).

- WX-PA displays “Top Mnt”.

(26) On the WX-PA, select a cardinal bearing of 180° and a range of 75 NM.

- Use F1 and F2 buttons to adjust range and the F3 and F4 buttons to adjust bearing.

(27) On the WX-PA, with “Continuous Out” still selected on the MODE MENU, then press the MENU/ENTR button once so that WX-PA indication changes from “PAUSED” to “RUNNING”.

(28) On the PFD, press the STRIKE CLEAR LSK.

- Strike data cleared from PFDs, then begins building again.

(29) Verify that the Strike Rate is displayed on the PFDs.

- Strike RATE will show 600 ± 200 strikes per minute.

(30) Test strikes appearing on the PFDs are at approximately 180 ± 10° relative and 75 NM.

(31) With aircraft magnetic heading active, turn the aircraft 45 ± 5° clockwise, or to the right.

(32) Older test strikes on PFDs are at approximately 135 ± 30° relative and 75 NM. Newer strikes displaying at approximately 180 ± 10° relative and 75 NM. Each newer test strike during the turn forms part of an approximately 45° “arc” pattern, from approximately 135° relative to approximately 180° relative.

(33) Power down the WX-PA Portable Analyzer unit and remove WX-PA test set and antenna from aircraft.

B. Connect an External Battery Pack to the aircraft EXTERNAL POWER RECEPTACLE and turn on power. Ensure the green EXT POWER light on the IPL is on, but do not turn on aircraft’s power. Refer to AMM-24-40-00-051-801 – External Power - Maintenance Practices.

6. Job Close-Up

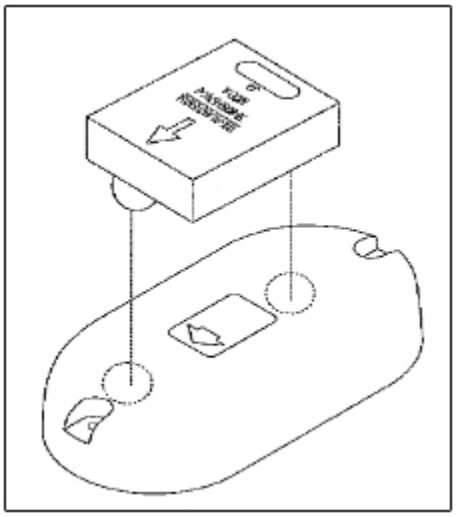
SUBTASK AMM-34-40-50-071-B-921-002

A. If no other work is to be performed, turn off the aircraft power by setting the SYS BATT and START BATT Switches to the OFF (down) position, and the BUS TIE to OPEN (down) position.

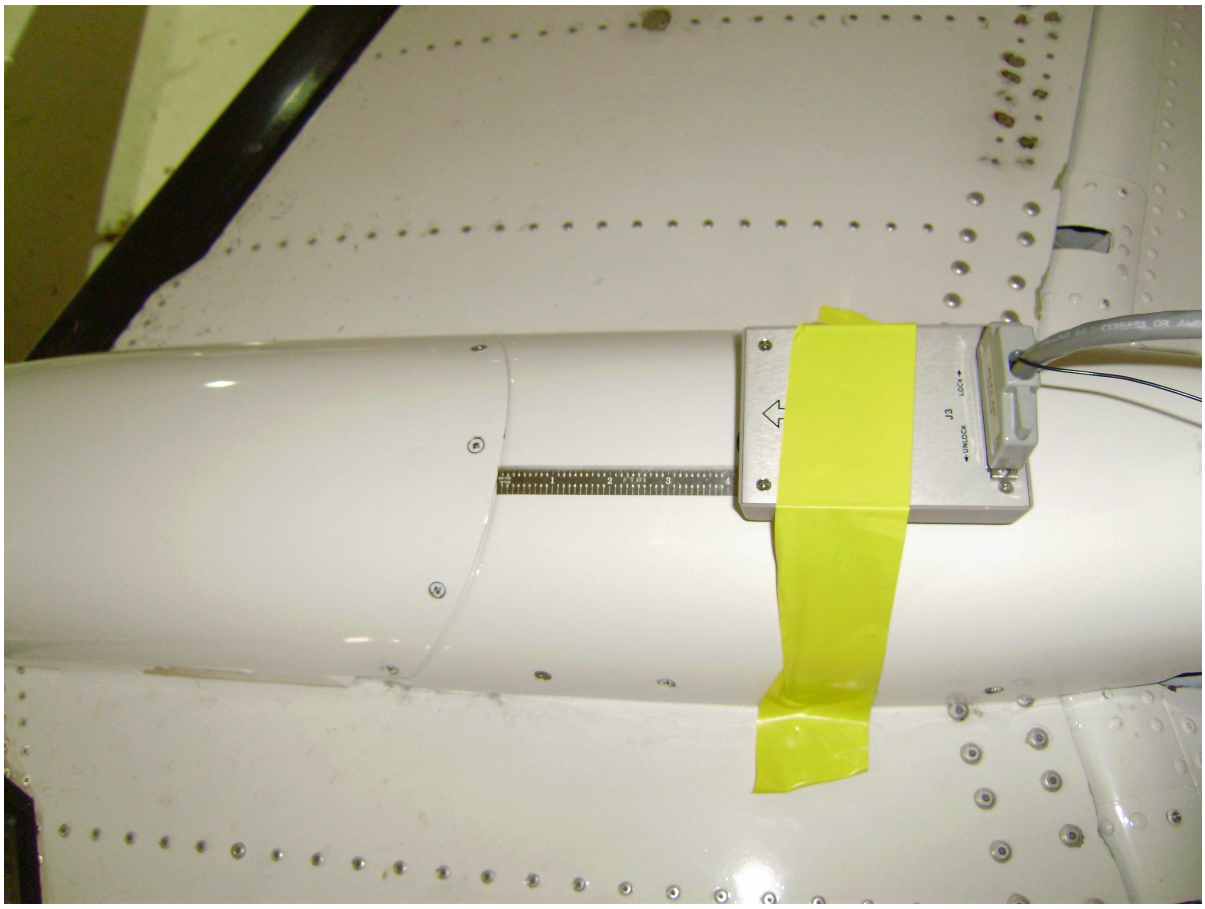
B. If there are no other requirements for External Power, disconnect External Battery Pack from the aircraft EXTERNAL POWER RECEPTICLE.

C. Install (if removed) 331 DT - Upper Overfin Fairing. Refer to AMM-06-50-00-051-801 – Aircraft Access Panels for location and installation instructions.

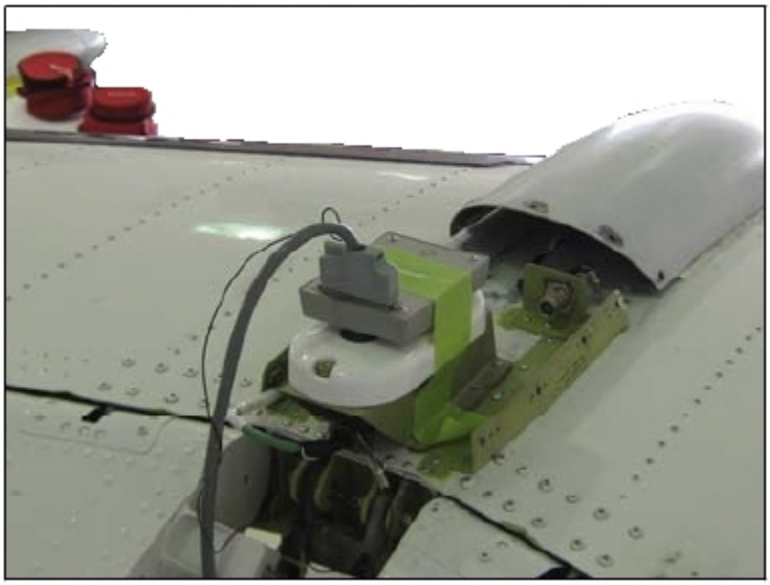
D. Remove all tools, equipment, and unwanted material from work area. If all other maintenance is complete, return aircraft to service. Refer to AMM-20-00-02-051-801 – Return To Service (After Maintenance).



WX-PA Antenna Alignment
Figure 501 (Sheet 1 of 1)



Positioning the WX-PA Antenna on the Over Fin Fairing
Figure 502 (Sheet 1 of 1)



WX-PA Antenna Attachment
Figure 503 (Sheet 1 of 1)

PFD Stormscope Overlay (Cell Mode / Strike Mode)
Figure 504 (Sheet 1 of 1)