MAINTENANCE MANUAL SUPPLEMENT

for

AIRCRAFT WITH THE FC-110 AUTOPILOT AND INNOVATIVE SOLUTIONS AND SUPPORT (IS&S) AIR DATA SYSTEM QUALIFIED FOR OPERATIONS IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE

of

LEARJET 23 AIRCRAFT

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Avcon Industries, Inc.

A subsidiary of Butler National Corporation
19920 W. 161st Street
Olathe, KS 66062

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Butler National Corporation
19920 W. 161st Street
Olathe, KS 66062

www.butlernational.com

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I DESCRIPTION

The Avcon Industries, Inc. (Avcon) RVSM solution for the Learjet 23 Series aircraft incorporates panel-mounted Innovative Solutions and Support (IS&S) Altimeter/Air Data Display Units (ADDU). This manual provides maintenance information for Learjet 20 Series aircraft with the FC-110 autopilot and IS&S air data system.

A. IS&S EQUIPMENT CONFIGURATION

The IS&S Altimeter/ADDU combines the features of a standard static pressure altimeter with an air data computer. This unit is interfaced to the existing FC-110 autopilot and provides altitude hold, speed hold (optional), and altitude alert functions. The altimeter display can be set in feet or meters. The barometric pressure can be set in inches of mercury or millibars.

A TEST button on each unit initiates the Initial and Self-Test function. Refer to TEST Section of this document for details.

The ADDUs are interfaced to an Analog Interface Unit (AIU) via RS-422 data bus. The AIU is an adapter for the air data interface to the autopilot. The AIU is connected to an annunciator/switch panel. This installation provides an annunciator/switch panel that displays an AIU FAIL annunciator and ADC 1 and ADC 2 annunciator/switches that allow either ADDU to be selected as the active altimeter for autopilot inputs and altitude encoding data that interfaces to the transponders.

An ALT light on each unit illuminates and an altitude alert tone sounds in conjunction with the operation of the altitude alerter function of each ADDU.

The existing right-hand and left-hand Mach switches have been removed, modified and their functions changed to operate with appropriate values for the RVSM equipment.

A standby altimeter is installed to provide a backup altimeter when normal aircraft power is interrupted. Emergency lighting power is provided by the existing emergency battery(s)

II LOCATION

> **NOTE: It is imperative to prevent or significantly reduce potential contamination or debris from coming into contact with the wiring and components during all maintenance, repairs and modifications. This begins with always being aware of potential wiring contamination, and remembering to install appropriate protection (e.g. plastic sheeting), as necessary, to cover avionics/electrical wiring and components. Furthermore, a "clean-as-you-go" attitude helps maintain the integrity of the installation. In other words, care should be taken to protect wire bundles and connectors during work, and to insure that all shavings, debris and contamination are cleaned up after work is completed.**

A. IS&S EQUIPMENT CONFIGURATION

The ADDUs replace the existing pilot and copilot altimeters. The standby altimeter is installed in the center instrument panel. The ADDU annunciator/switch panel assembly replaces the altitude alerter and is installed in the instrument panel. The AIU is installed in the nose compartment. Table 1 lists the system circuit breakers related to the RVSM modification.

Circuit Breaker	Location	Unit Protected
ALT 1	LH Forward Bus	ADDU #1 28VDC
AIU AC	AC Bus	AIU 26VAC Reference
AIU DC	RH Forward Bus	AIU 28VDC
ALT 2	RH Forward Bus	ADDU #2 28VDC
STATIC SOURCE	LH Forward Bus	Isolation Valves
STBY ALT	RH Forward Bus	Standby Altimeter Vibrator

Table 1, System Circuit Breakers

III EQUIPMENT

NOTE: BEFORE ATTEMPTING TO REMOVE OR INSTALL ANY UNITS, TURN ELECTRICAL POWER TO THE AIRCRAFT OFF.

A. IS&S EQUIPMENT REMOVAL

A. To remove the ADDU:

(1) Remove attaching hardware.

(2) Pull unit out of panel and disconnect wiring harness.

(3) Disconnect pitot-static lines

(4) If unit requires repair or troubleshooting, proceed as follows:

- Return unit to Avcon Industries, Inc., component manufacturer, or an authorized repair facility.

B. To remove the AIU:

(1) Gain access to unit in the nose compartment.

(2) Loosen hold-down securing unit to rack.

(3) Disconnect wiring harness.

(4) Slide unit forward out of rack.

(5) If unit requires repair or trouble shooting, proceed as follows::

- Return unit to Avcon Industries, Inc., component manufacturer, or an authorized repair facility.

B. STANDBY ALTIMETER REMOVAL

To remove the standby altimeter assembly:

(1) Remove attaching hardware.

(2) Pull unit out of panel and disconnect wiring harness.

(3) Disconnect static line.

(4) If unit requires repair or troubleshooting, proceed as follows:

- Return unit to Avcon Industries, Inc., component manufacturer, or an authorized repair facility.

C. ISOLATION VALVE REMOVAL

To remove the isolation valve:

(1) Remove nose compartment access doors and remove equipment as required to gain access to the defective isolation valve.

(2) Disconnect tubing assemblies from the isolation valve.

(3) Disconnect electrical wiring from the isolation valve.

(4) Disconnect attach hardware securing isolation valve and remove it from the aircraft.

(5) Remove AN fittings from both ends of the valve and retain for reinstallation of replacement valve.

IV INSTALLATION OF EQUIPMENT

NOTE: Installation of the AIU, ADDU and Isolation Valves must be accomplished with units that have the identical part number as listed in Table 1 of the Instructions for Initial and Continued Airworthiness, Avcon Document No 00307015. Installation of the Standby Altimeter must be accomplished with a unit that meets or exceeds the requirements of TSO-C10b

A. IS&S AIU INSTALLATION

To install the AIU:

(1) Gain access to nose compartment.

(2) Slide unit into rack and connect electrical connection.

(3) Tighten hold-down clamp to secure unit in rack.

(4) Perform applicable test per TEST procedure. Reference Sections V, VI and VII of this document.

(5) Return aircraft to its airworthy condition.

B. STANDBY ALTIMETER INSTALLATION

To install the standby altimeter assembly:

(1) Connect wiring harness.

(2) Connect static line.

(3) Place unit in panel and secure with attaching hardware.

(4) Perform static system check as provided in Sections VIII and IX below.

(5) Return aircraft to its airworthy condition.

C. IS&S ADDU INSTALLATION

To install To install the ADDU:

(1) Connect pitot-static lines.

(2) Connect wiring harness.

(3) Secure unit in panel with attaching hardware.

(4) Perform pitot/static plumbing check as provided in Sections VIII and IX.

(5) Perform applicable test per TEST procedure. Reference Sections V, VI and VII in this document.

(6) Return aircraft to its airworthy condition.

NOTE: Air Data System accuracy check must also be complied with in accordance with Section III.G of the Instructions for Initial and Continued Airworthiness, Avcon Document 00307015.

D. ISOLATION VALVE INSTALLATION

To install the isolation valve:

(1) Install retained AN fittings from removed valve using new O-rings.

(2) Torque AN fittings to 50-60 inch pounds.

(3) Install isolation valve using attachment hardware.

(4) Reconnect electrical wiring.

(5) Reconnect tubing assemblies and hand tighten. Torque tube assemblies to 110-130 inch-pounds.

(6) Perform pitot-static plumbing check as provided in Sections VIII and IX.

(7) Comply with Isolation Valve Functional Test Section XIII.

(8) Return aircraft to its airworthy condition.

V ADJUSTMENT/TEST INTRODUCTION

A. ADJUSTMENT/TEST

A. Purpose

The following procedure provides instructions for verifying proper operation of ADDU with altitude alerter and AIU.

> **NOTE: The following test procedure requires qualified operators using approved aircraft operational procedures.**

B. Test Equipment Required

(1) Pitot-static ramp tester
(2) Transponder ramp tester
(3) Precision resistance unit

C. Reference Documents:
Aircraft Flight Manual Supplement

VI TEST SET-UP

A. Verify that all equipment necessary for the test (all cockpit avionics & electrical equipment, circuit breaker panels and remotely mounted nose, tail, and equipment bay equipment) is installed in the aircraft before proceeding.

B. Apply external power to the aircraft.

C. Verify that the ADDU, AIU, and all optional systems supplying information to the ADDU or AIU are powered and properly functioning.

D. Verify that all circuit breakers are in on all circuit breaker panels, except those necessary for ground safety (pitot heat, sensor heat).

VII BUILT-IN TEST

A. Initial Built-In-Test/Self-test (BIT)

(1) Press the bezel-mounted TEST button on an ADDU (lower right of ALT SEL knob; a pencil may be needed to press the button).

- The ADDU and AIU will begin their BIT tests.

(2) Verify the following:

a. AIU FAIL annunciator illuminates.

b. Altitude counter displays for 2.5 seconds the number of hours the altimeter has been in operation.

c. Display is blanked for one second.

d. Display test starts.

(3) Verify the following:

a. Pointer is sequenced Zero through nine (0 to 9) concurrent with the Altitude Counter and Baro Counter displaying digits corresponding to the pointer position.

b. The right digit of the digital altitude display will display 0 for digits 0 through 9.

c. The right digit is in the selected altitude display will display the digit 0 for digits 0 through 9.

d. The Baro Counter's left digit displays digits 1, 2 and 3 only, and digit 3 for 3 through 9 and 0.

e. The display legends and flags (STBY, M, ft., In.Hg, Hpa, PWR, COM, and A) will be illuminated for the duration of this sequence (approximately ten seconds).

f. During the test the aural altitude alert will be momentarily activated.

NOTE: The ADDU under test must be the selected ADC on the ADC1/ADC2 switch panel for altitude alert tone to occur.

NOTE: When troubleshooting the ADDU, depressing the TEST switch before the end of the display test will display any fault codes stored as a result of the continuous automatic BIT for 2.5 seconds. These fault codes should be recorded and Avcon Industries, Inc. or the component manufacturer should be contacted.

(4) Upon completion of the display test/fault code display, the ADDU will display the following, "L245-" in the center (altitude) display, the autopilot designation (A105) in the lower left (ALT SEL) display, the position installation (1 for pilot's ADDU and 2 copilot's ADDU) in the left-most digit of lower right (Baro setting) display, and the system installation (Yes, for SSEC configuration module installed) in the 3 right-most digits of lower right (Baro setting) display.

NOTE:	SSEC applied or not applied will be indicated respectively by the absence or presence of STBY.

- BIT should not exceed 45 seconds. If it does or if any fault codes are displayed, the ADDU is faulty and should be returned to the manufacturer for repair.

(5) Move the pilot's and copilot's instrument panel dimmer control and verify that the pilot's, copilot's, and standby altimeter's lighting adjusts properly.

B. Altitude Response Test

(1) Adjust the altitude preselect on each altimeter. Verify that when one preselect is changed, the other preselect altitude changes and the selected altitudes are identical.

(2) Select the ADC 1/ADC 2 select switch to ADC 1 position and verify that an "A" is displayed in the center of the display just above the altitude pointer pivot point on the pilot's ADDU and not on the copilot's ADDU. This indicates that the selected ADDU is the active master ADDU for autopilot and AIU outputs and is also the active altimeter is providing encoding information to the transponders.

a. Perform an automatic Pressure Altitude Reporting Equipment and ATC Transponder System Integration Test in accordance with FAR 43.

b. Verify that the difference between the automatic altitude reporting output and the pilot's ADDU displayed altitude does not exceed 125 ft.

(3) Select the ADC 1/ADC 2 select switch to ADC 2 position and verify that an "A" is displayed in the center of the display just above the altitude pointer pivot point on the copilot's ADDU and not on the pilot's ADDU.

a. Repeat Step VII.B.(2) a. and b. (immediately above) for the copilot's ADDU.

(4) With the ADDU's Baro setting set to a non-standard barometric setting, press the BARO set knob for less than two seconds and verify that 29.92 is automatically selected. Verify that each ADDU may be set independently from each other.

(5) Press and hold the BARO set knob in for longer than four (4) seconds but less than eight (8) seconds while in the In Hg mode. Verify that the system toggles from In.Hg to Hpa. Press and hold the BARO set knob again for longer than four (4) seconds but less than eight (8) seconds. Verify that the system toggles from Hpa to In.Hg. Verify that this can be done on each ADDU independently.

(6) Press and hold the BARO set knob in for longer than eight (8) seconds while in feet mode. Verify that the system toggles from feet to meters. Check again going from meters to feet. Verify that this can be done on each ADDU independently.

VIII PITOT AND STATIC SYSTEM MAINTENANCE PRACTICES

NOTE: **The installation of or the removal/installation of the pitot-static probe(s) requires that the Tasks presented in Section III.E of the Instructions for Initial and Continued Airworthiness, Avcon Document No 00307015 be accomplished.**

Pitot and static system leak checks shall be performed at the intervals specified in Chapter 5 of the applicable Learjet Maintenance Manual plus every 12 months as specified in Section III.D1 of the Instructions for Initial and Continued Airworthiness, Avcon Document No 00307015 as well as anytime an ADDU or the Standby altimeter is removed and/or replaced. When a pitot-static line connection is loosened, perform a pitot-static leak test only,

A. When performing static system leak check, it will be necessary to apply vacuum to both the pitot and static systems simultaneously. This will prevent severe pressure differential, which could cause instrument damage. Pressure in the pitot system shall always be equal to or slightly greater than that in the static system.

WARNING: PULL L PITOT HEAT CIRCUIT BREAKER ON PILOT'S C/B PANEL AND R PITOT HEAT CIRCUIT BREAKER ON COPILOT'S C/B PANEL BEFORE PERFORMING THE FOLLOWING PROCEDURES TO PREVENT DAMAGE TO EQUIPMENT AND POSSIBLE INJURY.

(1) Whenever a pitot or static line is disconnected, all exposed fittings must be capped or plugged.

(2) Pitot system leak check shall be performed and all leaks repaired prior to performing static leak check.

(3) All maintenance inspections shall be completed prior to performing leak checks.

(4) Use of the system schematic is recommended to prevent application of reverse pressure and to help determine the location of leaks.

(5) Test equipment must be calibrated and checked for leaks prior to use.

(6) The rate of pressure change or the pressure applied shall not exceed the design limits of the instruments.

IX PITOT AND STATIC PLUMBING AND INSTRUMENT TEST

CAUTION: VERIFY THAT BOTH PILOT AND COPILOT PITOT HEAT CIRCUIT BREAKERS ARE PULLED. APPLY PITOT PRESSURE VERY SLOWLY UNTIL 80 KNOTS IS REACHED.

A. Necessary Test Equipment

A calibrated Digital Air Data Test unit with a combined accuracy/repeatability of less than ±20 ft for altitudes up to 41,000 ft.

B. Pitot System Test

(1) After the aircraft instruments have been connected to the pitot plumbing, pressure shall be applied to each pitot tube inlet to give an airspeed instrument reading of 300 knots. Rate of pressure application shall not increase the airspeed indicator more than 20 knots per second after 80 knots is reached.

(2) Turn off pressure, seal the system, and verify that the system pressure drop in five minutes is not enough to cause an airspeed indicator drop of 5 knots

(3) If the leakage of pitot system exceeds the requirements of IX.B.(2), make necessary corrections and recheck until the system meets the requirements of IX.B.(2).

C. Static Plumbing and Instrument Test

NOTE: After the aircraft instruments have been connected to the pitot plumbing and the static plumbing, verify that the Static Port Switch is in the normal position, and then accomplish the following:

(1) Set airspeed to 200 knots on test set and apply vacuum to the static system until the air data test set altimeter indicates 30,000 feet altitude.

(2) Shut off the vacuum source, seal the pitot-static system, and verify that the system leakage in one minute does not cause the air data test set altimeter to indicate any more than a 300 ft loss.

(3) Open valves and release the vacuum on the system slowly to ambient altitude, at a rate within the range of the rate-of-climb indicator.

(4) If the leakage of static system exceeds the requirements of IX.C.(2), make necessary corrections and recheck until system meets the requirements of IX.C.(2).

D. Autopilot Air Data Functions

1. Altitude hold

a. With ADDU 1 selected, simulate an altitude of 10,000 ft. with the air data test set. Engage autopilot then press ALT to engage altitude hold; there should be no more than a 1/8" of control column movement when ALT is engaged.

b. Increase the simulated altitude to 10,050 ft.; the control column should move forward.

c. Decrease the simulated altitude to 9,950 ft.; the control column should move aft.

d. Disengage autopilot.

e. Repeat IX.D.(1)(a) through IX.D.(1)(d) with ADC 2 selected.

2. Speed Hold

a. In Speed Hold mode, test Speed Hold at a simulated altitude at 10,000 ft.

b. With ADDU 1 selected, establish an airspeed of 200 KIAS with the air data test set, engage autopilot, and then engage Speed Hold.

c. Increase the simulated airspeed to 220 KIAS; the control column should move aft.

d. Decrease the simulated airspeed to 180 KIAS; the control column should move forward.

e. Disengage Speed Hold.

f. Repeat IX.D.(2)(a) through IX.D.(2)(e) with ADC 2 selected.

E. Altitude Alerter

1. Altitude Alarms

a. Establish a simulated altitude to 6,500 ft.

b. With ADDU1 selected, set 5,000 ft on the altitude alerter.

c. Decrease altitude to 5,000 ft. Verify that alerter lamp illuminates and an aural warning sounds at 6,000 ft. Verify that alerter lamp extinguishes at 5,200 ft.

d. Increase altitude to 5,300 ft and verify that alerter lamp illuminates and an aural alert sounds at 5,200 ± 50 ft.

e. Return altitude to 5,000 ft. Verify that alerter lamp extinguishes at 5,200 ± 50 ft.

f. Decrease altitude to 4,700 ft. Verify that alerter lamp illuminates and the aural alert sounds at 4,800 ± 50 ft.

g. Return altitude to 5,000 ft. Verify that the alerter lamp extinguishes at 4,800 ± 50 ft.

h. Select 5,900 ft. on the altitude alerter. Verify that the alerter lamp is illuminated.

i. Increase altitude and verify that the alerter lamp remains illuminated until reaching 200 ± 50 ft. below the selected altitude, at which time alerter lamp extinguishes.

j. Increase altitude to 200 ± 50 ft. above selected altitude and verify that the aural alert sounds and alerter lamp illuminates.

k. With alerter lamp illuminated, rotate the Alerter Set knob to cancel current selected altitude and set new altitude approximately 3,000 ft. above current simulated altitude. While increasing altitude, switch ADC's and verify that at 1,000 ft. from selected altitude the aural alert sounds while alerter lamp illuminates and remains illuminated until reaching 200 ± 50 ft. from selected altitude.

l. Repeat IX.E.(1)(a) through IX.E.(1)(k) with ADDU 2 selected.

X PROBE ALIGNMENT ADJUSTMENT/VERIFICATION OF POSITION

A. Rosemount Pitot-Static Probe Alignment (See Figure 1, Rosemount Probe Alignment Tool).

NOTE: Perform Rosemount Probe Alignment Check in accordance with any required inspection interval. The Rosemount Probe is aligned 5 degrees nose down in reference to aircraft level. The Avcon Probe alignment tool incorporates a wedge so that when used the probe tool references level when the Probe is properly aligned (5 degrees nose down).

(1) Acquire necessary tools and equipment.

NAME	PART NUMBER	MANUFACTURER	USE
Digital Inclinometer		Commercially Available	Measure pitch and roll angles.
Probe Alignment Tool Kit	T24251110-2	Avcon Industries, Inc.	Rosemount Probe alignment tool.

(2) Jack aircraft.

(3) Level aircraft (Refer to the applicable Learjet Maintenance Manual).

(4) Clean mating surfaces of probe barrel tool and Part 3 attachment. Verify that there is no visual damage to the Rosemount Probe and the orifices are free from obstruction.

CAUTION: DO NOT APPLY EXCESSIVE TORQUE WHEN ATTACHING THE PART 3 ATTACHMENT TO AVOID BENDING THE PROBE.

(5) Secure Part 3 attachment to the probe barrel tool using an Allen wrench.

(6) Carefully slide probe barrel tool forward to aft onto pilot's Rosemount Probe. Verify that the guide is flush against the probe.

(7) Set the inclinometer on the Part 3 attachment along the scribe line that runs fore and aft. Verify that the probe is level within +/- 0.25 degree.

(8) Set the inclinometer on the Part 3 attachment along the scribe line that runs inboard and outboard. Verify that the probe is level within +/- 1.5 degrees.

(9) Note any discrepancies and remedy, as applicable.

CAUTION: USE CARE WHEN REMOVING TOOL FROM PITOT-STATIC PROBE. GENTLY SLIDE TOOL TO AVOID DAMAGING AIRCRAFT SKIN.

(10) Remove probe barrel tool from pilot's Rosemount Probe.

(11) Install probe barrel tool onto copilot's Rosemount Probe.

NOTE: Probe barrel tool will mount in reverse on the co-pilot's Rosemount Probe.

(12) Secure Part 3 attachment to the probe barrel Do not apply excessive torque when attaching the Part 3 attachment to avoid bending the probe.

(13) Set the inclinometer on the Part 3 attachment along the scribe line that runs fore and aft. Verify that the probe is level within ±0.25 degree.

(14) Set the inclinometer on the Part 3 attachment along the scribe line that runs inboard and outboard. Verify that the probe is level within ±1.5 degrees.

(15) Maximum allowable misalignment between the L/H and R/H Rosemont probe is +/- 0.25 degrees.

CAUTION: USE CARE WHEN REMOVING TOOL FROM PITOT-STATIC PROBE. GENTLY SLIDE TOOL TO AVOID DAMAGING AIRCRAFT SKIN.

(16) Note any discrepancies and remedy, as applicable.

(17) Remove probe barrel tool from Rosemount Probe.

(18) Remove aircraft from jacks. (Refer to the applicable Learjet Maintenance Manual.)

NOTE: Items 19, 20 and 21 shall be performed every 300 hours or 12 months, whichever occurs first.
Rosemount Probes shall be replaced every 10,000 flight hours

(19) Inspect the Rosemount Probes paying close attention to the static holes along the barrel of the probe. Verify that holes are clear of debris or any other obstructions.

a. Check the static pressure ports to ensure their edges remain perpendicular to the unit's machined contoured surface. Rounded or raised static port edges should not exceed 0.003 inches.

b. Check for scratches, nicks or surface irregularities deeper than 0.015 inches located within 0.50 inches of the static port orifices.

c. Check for defects exceeding 0.025 inches over the rest of the head, and exceeding 0.125 inches on the strut section of the unit.

(20) Inspect the area around the Rosemount Probe. There are markings at the corners of the Probe Critical Regions to make sure that the aircraft surface is free of paint, debris, or other contamination. Verify that the Probe Critical Region is free from damage or deformation. Deformation could include dents, cracks, skin stretch, creases, scratches, repairs, doublers, sealant, primer or paint, among other contaminants to airflow.

(21) Inspect the Rosemount Probe for damage or deformation. Use a sensitive measuring tool to check for small deformation to the probe. The Rosemount Probe must be overhauled or inspected by the manufacturer if:

a. There is tip erosion or damage with a flatness that exceeds 0.022 +/- 0.005 inches.

b. The lip edge is curled or lipped outward.

c. The tip is damaged by deformities of greater than 0.030 +/-0.005 inches on the tip lip. Small deformities around the tip that do not affect the roundness of the lip do not require replacement. Any indentation must not affect more than twenty percent of the circumference.

d. The leading edge lip may have small nicks or chips. If deformations exceed 0.035 inches deep, the tube must be replaced or repaired.

(22) After reapplying power to the aircraft check probe heat operation.

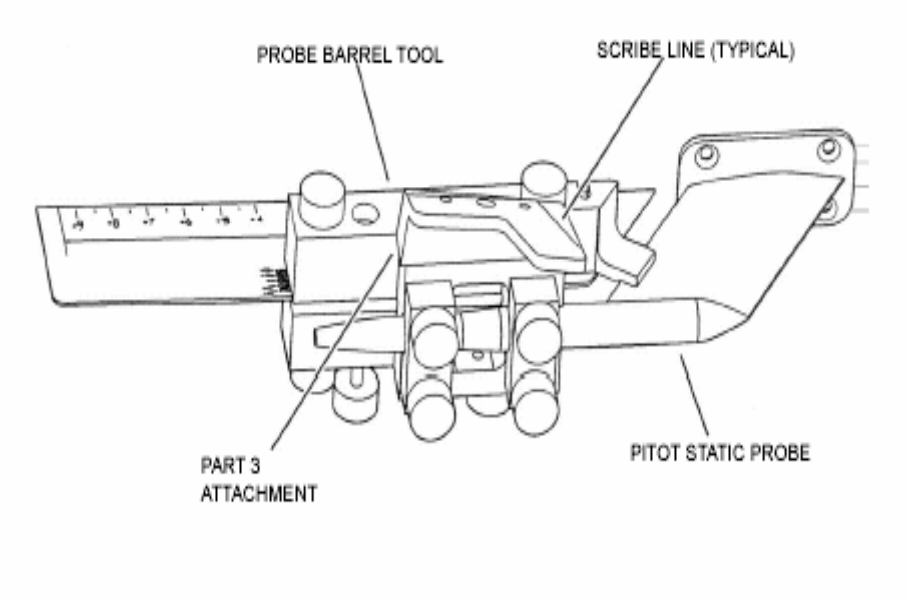

Figure 1, Rosemount Pitot Static Probe Alignment Tool

XI PITOT-STATIC PROBE REMOVAL

WARNING: THE FOLLOWING PROCEDURES ARE ONLY APPLICABLE TO REPLACING A PITOT-STATIC PROBE DUE TO HEATER ELEMENT FAILURE.

IN CASE OF A DAMAGED PROBE, SUPPORT STRUCTURE ALIGNMENT MAY HAVE BEEN ALTERED. CONTACT AVCON CUSTOMER SERVICE FOR DISPOSITION.

NOTE: The Avcon Rosemount pitot-static probe base mount incorporates an eccentric nut that is safety wired to the base mount. If the eccentric nut safety wire is missing verify the probe alignment per Section X.

A. Remove nose compartment access doors and remove equipment as required to gain access to the pitot-static probe. Remove power from the aircraft pull pitot heat circuit breakers.

B. Disconnect electrical connector from the pitot-static probe.

C. Loosen and disconnect pitot and static lines from pitot-static probe.

D. Remove attaching parts and pitot-static probe from aircraft. Clean old sealant from base mount.

XII INSTALLATION OF PITOT-STATIC PROBE

A. Apply fay seal to surface of base mount. Position pitot-static probe on base mount assuring that probe pin is fully engaged in eccentric nut and install attaching parts. Torque nuts to 30 to 40 inch-pounds [3.4 to 4.5 Nm].

B. Remove caps from pitot and static lines and connect lines to pitot-static probe.

C. Connect electrical connector to pitot-static probe.

D. Perform pitot and static probe alignment check per Section X above.

E. Perform pitot and static plumbing leak check. (Refer to Sections VIII and IX of this Supplement for instructions). Reset Pitot Heat circuit breaker and restore aircraft power.

F. Check pitot-static probe for proper heating as follows:

(1) Set applicable Pitot Heat Switch on.

(2) Check pitot-static probe starts to warm up.

(3) Set applicable Pitot Heat Switch off.

G. Install and functionally test previously removed equipment.

H. Install nose compartment access doors.

NOTE:	**The installation of or the removal/installation of the pitot-static probe(s) requires that the Tasks presented in Section III.E of the Instructions for Initial and Continued Airworthiness, Avcon Document No 00307015 be accomplished.**

XIII ISOLATION VALVE FUNCTIONAL TEST

A. Pitot-Static Isolation Valve Functional Test

NOTE:	**Perform Pitot-Static Isolation Valve Functional Test every 300 hours or 12 months, whichever occurs first.**

(1) Install Pitot-Static test adapter to pilot's pitot-static mast and connect pitot-static tester to pilot's static port 1.

(2) Set STATIC SOURCE Switch to BOTH.

CAUTION:	**WHEN APPLYING VACUUM TO THE PITOT-STATIC SYSTEM, ENSURE THAT THE TESTER CROSS-BLEED VALVE IS OPEN.** **TO AVOID DAMAGE TO AIRCRAFT INSTRUMENTS, DO NOT EXCEED 5000 FEET PER MINUTE RATE OF CLIMB OR DESCENT. DO NOT ALLOW AIRSPEED TO DECREASE BELOW ZERO.**

(3) Seal off static ports on copilot's mast.

(4) With tester cross-bleed valve open, apply a vacuum to the pilot's pitot-static port 1 until tester altimeter indicates 1,500 feet above field elevation. Do not exceed a rate-of-climb of 2,000 feet per minute.

(5) Slowly remove seal on copilot's static port 2 and verify air flow at static port 2.

(6) Seal copilot's static port 2.

(7) Disconnect pitot-static tester vacuum source from pilot's pitot-static port 1 and connect to pilot's pitot-static port 2.

(8) With tester cross-bleed valve open, apply a vacuum to the pilot's pitot-static port 2 until tester altimeter indicates 1,500 feet above field elevation. Do not exceed a rate-of-climb of 2,000 feet per minute.

(9) Slowly remove seal on copilot's static port 1 and verify air flow at static port 1.

(10) Seal off static ports on copilot's mast.

(11) Set STATIC SOURCE Switch to LEFT.

(12) With tester cross-bleed valve open, apply a vacuum to the pilot's pitot-static port 2 until tester altimeter indicates 1,500 feet above field elevation. Do not exceed a rate-of-climb of 2,000 feet per minute.

(13) Slowly remove seals from copilot's mast, and verify no air flow at copilot's static ports 1 and 2.

(14) Set STATIC SOURCE to BOTH. Verify air flow at copilot's static ports 1 and 2.

(15) Install Pitot-Static test adapter to copilot's pitot-static mast and connect pitot-static tester to copilot's static port 1.

(16) Seal off static ports on pilot's mast.

(17) Set STATIC SOURCE to RIGHT.

(18) With tester cross-bleed valve open, apply a vacuum to the copilot's pitot-static port 2 until tester altimeter indicates 1,500 feet above field elevation. Do not exceed a rate-of-climb of 2,000 feet per minute.

(19) Slowly remove seals from pilot's mast, and verify no air flow at pilot's static ports 1 and 2.

(20) Set STATIC SOURCE to BOTH. Verify air flow at pilot's static ports 1 and 2.

CAUTION: TO AVOID DAMAGE TO AIRCRAFT INSTRUMENTS, DO NOT EXCEED 5000 FEET PER MINUTE RATE OF CLIMB OR DESCENT. DO NOT ALLOW AIRSPEED TO DECREASE BELOW ZERO.

(21) Release vacuum from the pitot-static system.

(22) Remove Pitot-static tester from pitot-static test adapter.

(23) Remove pitot-static test adapter from aircraft.

(24) Inspect pitot-static probes to ensure that seals have been removed.

XIV STANDBY ALTIMETER – EMERGENCY LIGHTING

A. Purpose

The following procedure gives instructions for checking the illumination of the standby altimeter with the emergency power supply.

B. Equipment and Facilities Required – None

C. Perform a check of the standby altimeter emergency lighting as follows:

(1) Ensure that all aircraft power is off.

(2) Place the emergency battery switch in the “ON” position.

(3) Verify that the STANDBY ALTIMETER is illuminated and that the altimeter vibrator flag is in view.

(4) Verify that with the INSTR panel dimmer control in the ON (out-of-detent) position and that movement of the dimmer control has no control of the lighting illumination.

(5) Place the emergency battery switch in the “OFF” position.

XV AUTOPILOT MAINTENANCE/FLIGHT CONTROL RIGGING

NOTE:	**Perform the Flight Control Checks provided in the aircraft checklist and aircraft flight manual supplement. For checking the autopilot operation with the STC components installed, refer to Section IX.D of this document and test the autopilot with a pitot-static system tester connected to the aircraft. Also Refer to Section 22 of the applicable Learjet Maintenance Manual.**

A. Follow the maintenance practices described in Section 22 for servo and capstan maintenance practices and adjustments.

B. The Avcon Industries, Inc. RVSM modification does not change the rigging of the flight controls in the airplane. It is very important to achieve the required performance and have the aircraft controls in proper rig according to Section 27 (Adjustment/Test) of the applicable Learjet Maintenance Manual.

XVI MACH/OVERSPEED WARNING MAINTENANCE PRACTICES

A. General

1. Maintenance procedures for the Mach/Overspeed warning system consist of a functional check of the AIU and replacement of defective components.

2. During normal aircraft flight, the Mach/Overspeed System is seldom actuated; therefore, it is recommended that the system be functionally checked in accordance with current inspection requirements found in Chapter 5 of the appropriate Learjet Maintenance Manual.

3. Refer to Sections III.B and IV.A of this document for removal and installation procedures of the AIU. During normal aircraft flight, the Mach/Overspeed warning is seldom actuated; therefore, it is recommended that the Mach/Overspeed warning be functionally checked in accordance with current inspection requirements found in Chapter 5 of the appropriate Learjet Maintenance Manual.

B. Description

The Mach/Overspeed Warning System provides the crew with an aural warning when the aircraft exceeds a predetermined limit. The puller control system commands an aircraft nose-up attitude as a corrective action. The system consists of the IS&S 9B-81040-38 AIU, a pitot and static source, and a stick puller adjustment potentiometer. The system utilizes the autopilot pitch servo for stick puller activation. A Mach test switch on the pedestal is used to check system operation. The system is powered through the LH stall warning switch. The pilot may override the stick puller force at any time.

C. Mach/Overspeed System Functional Check

(1) Attach hose from Pitot/Static Tester pitot port to the RH pitot head. Remove cap from RH static line forward of the instrument panel and attach hose from Pitot/Static Tester static port to instrument static line. Ensure that static ports are blocked with tape and all drain valves are closed.

(2) Ensure that the Autopilot System is off. Set Battery Switch(es) and Left Stall Warning Switch to ON.

(3) Close Pitot/Static Tester source valves, vent valves and open the crossbleed valve.

CAUTION: DO NOT EXCEED 5000 FEET PER MINUTE RATE OF CLIMB WHILE APPLYING VACUUM TO THE PITOT AND STATIC SYSTEM. EXCEEDING 5000 FEET PER MINUTE RATE OF CLIMB MAY CAUSE DAMAGE TO THE INSTRUMENT.

(4) Using the Pitot/Static Tester vacuum pump and opening the vacuum source valve, apply vacuum to both the pitot and static systems until the co-pilot's altimeter indicates 10,000 feet corrected altitude (refer to instrument error correction card). Close source valve and crossbleed valve.

CAUTION: DO NOT EXCEED 20 KNOTS PER SECOND WHEN VENTING ATMOSPHERIC PRESSURE INTO PITOT SYSTEM. EXCEEDING 20 KNOTS PER SECOND MAY CAUSE DAMAGE TO THE INSTRUMENT.

(5) With crossbleed valve closed, slowly open pitot vent valve and vent atmospheric pressure into the pitot system. This will cause the co-pilot's airspeed indicator to increase. When aural warning sounds, immediately close pitot vent valve and record airspeed at which aural warning sounds. Aural warning will sound at 300 (±3) knots at 10,000 feet.

(6) Slowly open Pitot/Static Tester crossbleed valve to return airspeed indicator to zero.

(7) With the crossbleed valve open and using the Pitot/Static Tester vacuum pump and opening vacuum source valve, apply vacuum to both the pitot and static systems until co-pilot's altimeter indicates 41,000 feet corrected altitude (refer to instrument error correction card). Close vacuum source valve and crossbleed valve.

NOTE: Aircraft equipped with the Automatic Flight Control/Stability System (AFC/SS), follow Steps (8A) through (10A) and continue with Step (11). Aircraft not equipped with the AFC/SS, follow Step (8B) and continue with Step (11).

(8A) With crossbleed valve closed, slowly open pitot vent valve and vent atmospheric pressure into pitot system. This will cause the co-pilot's airspeed indicator to increase. When aural warning sounds and puller activates, immediately close pitot vent valve and record airspeed at which aural warning sounds. Aural warning will sound at 0.78 (±0.01) Mach (227 to 233 knots) at 41,000 feet.

(8B) With crossbleed valve closed, slowly open pitot vent valve and vent atmospheric pressure into pitot system. This will cause the co-pilot's airspeed indicator to increase. When aural warning sounds, immediately close pitot vent valve and record airspeed at which aural warning sounds. Airspeed should correspond to maximum operating Mach number (M_{MO}) within ±0.01 at 41,000 feet found in the appropriate Avcon RVSM Airplane Flight Manual Supplement (AFMS).

(9A) Engage Autopilot System. Aural warning horn will stop.

(10A) Open pitot vent valve and increase airspeed until aural warning sounds and puller activates. Immediately close pitot vent valve and record airspeed. Airspeed should correspond to maximum operating Mach number (M_{MO}) within ±0.01 at 41,000 feet found in the appropriate Avcon RVSM Airplane Flight Manual Supplement (AFMS).

(11) Slowly open crossbleed valve to return the airspeed indicator to zero. With the crossbleed valve open, slowly open the static vent valve to return the altimeter to field elevation.

(12) Disconnect Pitot/Static Tester from the static and pitot systems. Set Battery Switch(es) and Left Stall Warning Switch to OFF. Install instrument line plug and remove tape from static ports and drains.