INSTRUCTIONS FOR INITIAL AND CONTINUED AIRWORTHINESS FOR LEARJET 24, 25, 28 AND 29 SERIES AIRCRAFT QUALIFIED FOR OPERATIONS IN REDUCED VERTICAL SEPARATION MINIMUM (RVSM) AIRSPACE

Model No. :_____

Aircraft S/N: _____

Prepared For

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Log of Revisions

Rev	Date	Affected Pages	Initial
Original	05 March 2003	All pages.	RTM
A	22 Sept. 2003	Title page – iv, Updated to Revision A, p. 3.1, Removed RVSM from first sentence of Sect. 3.1, p. 3.6, Added new step and definition to test procedures, p. 3.7, Added 50,000 ft points to Table 3.1, pp. 3.8, 3.10, Updated references to Maintenance Manual Supplement, p. 3.13, Added leak check requirement, p. 4.2, Corrected typo.	RTM
B	15 March 2004	Title page – vi, 1.1, 2.1 – 2.5, 3.1 – 3.13, 4.1 – 4.2, Updated document to latest ICA format and content including making it applicable to all Learjet 24 / 25 Series aircraft.	RAS
C	12 April 2004	Title page – vi, Updated to Revision C. p. 1.1, Added text for clarity, p. 2.1, Added text for clarity, pp. 2.2 - 2.3, Corrected typos and moved installed equipment list to Section 2.2, p. 2.4, Corrected typos, p. 2.5, Added notes for clarity, pp. 3.1 - 3.6, Corrected typos, p. 3.8, Added text for clarity, p. 3.9, Expanded to all flight operations, p. 3.11, Modified Table 3.2 header, pp. 3.12 – 3.13, Added text for clarity, pp. 4.1 – 4.2, Added text for clarity.	RTM
D	9 Nov. 2004	Title page – vi, Updated to Revision D, pp. 1.1 – 2.2, 2.4, Included Learjet 28/29 Series aircraft, p. 2.5, Updated Table 2.1, pp. 3.1 – 3.2, Included Learjet 28/29 Series aircraft, p. 3.3, Added pitot-static probe replacement note, p. 3.7, Included Learjet 28/29 Series aircraft, p. 3.8, Added pitot-static probe replacement note, Added Section 3.7.1, pp. 3.9 – 3.14, Rolled pages due to new section, pp. 4.1 – 4.2, Included Learjet 28/29 Series aircraft. Added Appendix A to document installed autopilots.	RTM
E	18 March 2005	Title page – vi, Updated to Revision E, p.2.5, Corrected Mach/Airspeed Switch footnote typo, p.3.2, Added requirement to fill out form in Appendix A, p.3.4, Added requirement to fill out form in Appendix A, p.3.11, Added requirement to fill out form in Appendix A.	RTM
F	25 May 2006	Title page – vi, Updated to Revision F, p.2.5, Added -38 AIU, p.3.7, Mach/Overspeed Warning System was Mach/Overspeed Warning Switch(es).	SAW

Log of Revisions

Rev	Date	Affected Pages	Initial
G	31 January 2007	Title page – vii, Updated to Revision G p. 3.1, Added reference to Sections 3.6.1 and 3.6.2. p. 3.4, Added Mode 'C' & Mode 'S' transponder check. p. 3.6, Renamed Section 3.6 and added Section 3.6.1. p. 3.8, Added Section 3.6.2. p. 3.15, Added Section 3.11.5.	CTH
H	30 January 2008	Title page – vii, Updated to Revision H p. 2.5, Added 9D-80170-1 and 9B-06017-32 to Table 2.1.	CTH

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Abbreviation	Description
ADDU	Air Data Display Unit
AFM	Aircraft Flight Manual
AIU	Analog Interface Unit
14 CFR	Title 14 of the Code of Federal Regulations
CM	Configuration Module
DME	Distance Measuring Equipment
FAA	Federal Aviation Administration
FL	Flight Level
ft	feet
FSDO	Flight Standards District Office
hr	Hours
in. Hg	Inches of Mercury
IS&S	Innovative Solutions & Support
kt	knots
LH	Left Hand Side
mb	millibars
min	Minutes
M_{MO}	Maximum Operating Mach Number
PMA	Parts Manufacturer Authorization
P/N	Part Number
RH	Right Hand Side
RVSM	Reduced Vertical Separation Minimum
SRM	Structural Repair Manual
TSO	Technical Standard Orders

1 Airworthiness Limitations

The Airworthiness Limitations section is FAA-approved and specifies maintenance required under §§43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved.

It is noted that there are no Airworthiness Limitations associated with the installation of STC ST01195WI or the Reduced Vertical Separation Minimum (RVSM) airworthiness compliance for the Learjet 24, 25, 28 and 29 Series aircraft.

2 Aircraft Configurations / System Description

2.1 Introduction

The Learjet 24, 25, 28 and 29 Series aircraft, has been shown to qualify for normal flight operations per Title 14 of the Code of Federal Regulations (14CFR), Part 25 and for operation in RVSM airspace as group aircraft in accordance with Part 91, Appendix G, “Operation in Reduced Vertical Separation Minimum (RVSM) Airspace”, and FAA Document No: 91-RVSM, Change 2, dated 10 Feb. 2004, “Guidance for Approval of Aircraft for Reduced Vertical Separation Minimum (RVSM) Flight”. This qualification is based on analysis of the configuration and performance of the air data, automatic altitude control, altitude alerting, and altitude reporting systems. These systems must be maintained in accordance with the inspections and tests specified in this document and other current maintenance practices to guarantee initial and continued compliance to both normal flight and RVSM specifications. Revisions/changes to the Instructions for Continued Airworthiness will be distributed in accordance with Avcon Industries’ “PMA Quality Control Manual”, Rev E, dated 27 December, 2001 or latest approved revision.

When the owner/operator of a Learjet 24, 25, 28 and 29 Series aircraft implements this STC they must add the initial and continued airworthiness inspections and test instructions contained in this document to the existing maintenance and flight operations programs for their airplane. The operator, when applying for approval to operate in RVSM airspace, should coordinate with the appropriate FAA Flight Standards District Office (FSDO) to determine what documentation must be provided to prove compliance with the requirements for initial airworthiness. When compliance with the initial airworthiness tasks has been demonstrated, RVSM operational approval may be granted by the FSDO. After initial airworthiness has been granted, the airplane must be maintained in accordance with the continued airworthiness requirements presented in Section 3.3 of this document. Any deviation from these procedures must be coordinated through Avcon Industries, Inc. and the responsible airworthiness authority prior to operation in RVSM airspace.

The information presented in this document supplements or supersedes the existing maintenance requirements only in those areas specified. Refer to the manufacturer’s requirements and procedures for maintenance procedures pertaining to the airplane’s systems and specific avionics equipment not covered in these instructions.

2.2 Aircraft Configuration

The Learjet 24, 25, 28 and 29 Series aircraft are equipped with two independent air data systems comprised of cross-coupled, probe-mounted static sources and Air Data Display Units (ADDU's), which will perform the combined functions of the altimeters, air data computers, altitude pre-selectors, and altitude alerters. The aircraft is also equipped with a single autopilot and two altitude-reporting transponders. A standby altimeter, also installed, is connected to an independent static source. The installation and operation of these systems have been shown to meet RVSM requirements.

The Learjet 24, 25, 28, and 29 Series aircraft are equipped with either two CJ-610-6 engines (certified to operate up to FL450) or two CJ-610-8A engines (certified to operate up to FL510) and M_{MO} = 0.81 (based on the new Pitot-Static Probe Installation). Any future engine changes/modification, including hush kits, may affect RVSM performance, and hence, these instructions. Contact Avcon Industries, Inc. if such engine changes/modifications are, or shall be, performed.

RVSM compliance was demonstrated with the following equipment installed on the test aircraft:

1. An L-band antenna (typically 3.5 inches tall or less) located approximately 2.5 inches aft of the radome on the aircraft centerline on the bottom of the aircraft.
2. A Radar Altimeter blade antenna (typically 2.0 inches tall or less) located approximately 5 inches aft of the radome on the aircraft centerline on the bottom of the aircraft.
3. A DME antenna (typically 2.5 inches tall or less) located approximately 8 inches aft of the radome on the aircraft centerline on the bottom of the aircraft.
4. A Marker Beacon blade antenna (11.5 inches long an 2.25 inches tall located approximately 60 inches aft of the radome on the aircraft centerline on the bottom of the aircraft.
5. A DME antenna (typically 2.5 inches tall or less) located approximately 60 inches aft of the radome on the aircraft centerline on the bottom of the aircraft.
6. An oxygen access door approximately 8.0 inches long and 5.0 inches tall located approximately 28 inches aft of the radome on aircraft's right hand side (fuselage clock position 9:00, facing aft).
7. Two tandem ADF blade antennas (typically 7.0 inches tall or less) located approximately 35 inches aft of the radome at fuselage clock positions 5:00 and 7:00.

8. A single ADF blade antenna (typically 7.0 inches tall or less) located approximately 35 inches aft of the radome at fuselage clock position 5:00 (looking aft).
9. Having no ADF blade antennas installed is also acceptable.
10. Two Teledyne Angle of Attack Cones located approximately 5 inches aft of the radome at fuselage clock positions 3:30 and 8:30.
11. Two Angle of Attack Vanes located approximately 5 inches aft of the radome at fuselage clock positions 3:30 and 8:30.
12. Two Angle of Attack Vanes located approximately 51 inches aft of the radome at fuselage clock positions 3:30 and 8:30.

NOTE: Contact Avcon Industries Inc. prior to the removal of existing antennas or the installation of any additional antennas or other objects that protrude into the airstream forward of the pitot-static probes or within the RVSM Critical Region as installation of additional antennas or the removal of the previously noted antennas may invalidate the RVSM certification for this aircraft.

2.3 Avionics System Description

Static pressure information is provided to the Innovative Solutions & Support (IS&S) Air Data Display Unit (ADDU) through cross-coupled, probe-mounted static sources located on the left and right sides of the fuselage. The ADDU's, through a static source error correction, incorporated in the Configuration Modules (CM), provide corrected altitude information to the altimeters for display. The autopilot and altitude alerter receives altitude deviation data from the pilot or the copilot's ADDU. Both the pilot's and copilot's ADDU's can provide altitude data to either transponders for altitude reporting. The aircraft system components approved for RVSM operations on the Learjet 24, 25, 28 and 29 Series aircraft, are presented in Table 2.1.

The components listed in Table 2.1 must be maintained in accordance with approved maintenance practices, and the Initial and Continued Airworthiness instructions presented in this document.

This document does not constitute approval for installation of the components listed in Table 2.1. This document is invalid unless these components have been installed per Avcon Drawings 24251100 and 24251101 and approved by the appropriate Certifying Authority. Any deviation from this equipment list (except as noted) invalidates the RVSM approval for this aircraft. Replacement of the listed equipment must be accomplished with units of identical part number. If alternate avionics equipment is to be or intended to be installed, a re-evaluation of the configuration for equivalent RVSM performance must be performed and approved.

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TABLE 2.1 Required Avionics and Air Data Components for RVSM Operation on a Learjet 24, 25, 28, and 29 Series Aircraft

Component	Manufacturer/Model	Part Number
Air Data Display Unit #1 (ADDU1)	IS&S/ADDU	9D-80130-15 or 9D-80170-1
Air Data Display Unit #2 (ADDU2)	IS&S/ADDU	9D-80130-15 or 9D-80170-1
Analog Interface Unit (AIU)	IS&S/AIU(6)	9B-81040-32 or 9B-81040-38
Configuration Module #1 (CM1)	IS&S/CM	9B-03508-116(1)(8) or 9B-06017-32(1)(8)
Configuration Module #2 (CM2)	IS&S/CM	9B-03508-116(1)(8) or 9B-06017-32(1)(8)
Transponder #1 & #2	Collins/TDR-90	622-1270-001(2)
Autopilot	L-3/Jet FC-110	FC-110
Autopilot Amplifier	L-3/Amplifier(3)	4-2020-202 (L25D) 4-2020-039 (L28)
Autopilot Controller	L-3/Controller(3)	501-1254-01 (L25D) 501-1254-03 (L28)
Standby Altimeter	Aerosonic	16650-1150(4)
Pitot-Static Probes	Rosemount	0856NA-1 (LH) 0856NA-2 (RH)
Isolator Valves (Qty. 4)	Dukes	1484-00-3
Mach/Airspeed Indicator (Qty. 2)	Various	24251134-XX(5)
Mach/Airspeed Switches	Learjet/6600XXX-XX(5)(6)	24251134- XX(5)(6) 00206101-XX(6)(7)
Outside Air Temperature Probe	Honeywell/159-08256-0001	050-03610-0002

Notes:
1. When the IS&S Configuration Module is correctly installed, the Air Data Display Units (ADDU) will display “L245-" at start-up. If either ADDU does not display “L245-" at start-up, RVSM operations are prohibited.
2. Any transponder that meets or exceeds the requirements of one of the following Technical Standard Orders (TSO), TSO-C74b, TSO-C74c or TSO-C112 may be substituted for those listed.
3. Because of a variety of different part numbers associated with the Jet FC-110 autopilot components, Appendix A must be filled out and signed for each aircraft.
4. Any standby altimeter that meets or exceeds the requirements of TSO-C10b may be substituted for the unit listed.
5. The Mach/Airspeed Indicators and switches are modified per Avcon Drawing 24251134. The model number and corresponding part numbers of both the Mach/Airspeed Indicators and switches are defined in Avcon Drawing 24251134.
6. The 9B-81040-38 AIU is a direct replacement for the 9B-81040-32 AIU. If the -38 AIU is installed, the Mach/Airspeed Switches are removed.
7. The Airspeed Indicators are modified per Avcon Drawing 00206101 for aircraft equipped with the -38 AIU.
8. The 9B-03508-116 Configuration Module may be installed in the 9D-80130-15 ADDU, only. The 9B-06017-32 Configuration Module may be installed in the 9D-80170-1 ADDU, only.

3 Maintenance Instructions

The following inspections, tests, and/or procedures must be included in the basic maintenance plan for the Learjet 24, 25, 28 and 29 Series aircraft to ensure initial and continued airworthiness for operations in RVSM airspace. Both altimetry systems (Pilot/Copilot) must be maintained in accordance with these instructions. The information presented in this section supplements or supersedes the basic airplane manuals only in those areas specified.

NOTE: For all cases in which the instructions in this document and the Aircraft Maintenance Manual are in conflict, the most restrictive instructions take precedence.

Normal air data system maintenance specified in the maintenance manual must still be followed as required. For maintenance procedures pertaining to the airplane's systems and specific avionics equipment not covered in these instructions, see the manufacturer's requirements and procedures. The maintenance tasks and required intervals are summarized in the following sections.

3.1 Requirements for Initial Airworthiness Approval

The following inspections/tests are required for initial airworthiness approval:

1. Verify the correct avionics components are installed in accordance with Section 2.3, Table 2.1 and that all required/appropriate Maintenance Manual Supplement (Avcon Doc. No. AI 202057) Installation Functional Checks have been successfully performed.

2. Perform an air data system check in accordance with Section 3.6.1 using calibrated ground test equipment, and verify the air data system errors are within RVSM tolerances specified in Table 3.1. The RVSM tolerances specified in Table 3.1 will verify proper implementation of the static source error correction in the Configuration Modules (CM1 and CM2).

3. For aircraft operating in EASA member states, perform the Mode 'C' and Mode 'S' transponder check in accordance with Section 3.6.2 using calibrated ground test equipment, and verify the reported altitudes are within the specified tolerances.

4. Perform a Pitot-Static Probe Inspection and Installation Angle Measurement as defined in Section 3.7 and record the results in the aircraft maintenance records. This inspection requires that the aircraft be jacked and leveled and that the rear access door be opened to verify that the aircraft is level.

5. Perform the following inspections for the RVSM Critical Region as defined in Section 3.8 and Figure 3.1:

(a) Ensure that the RVSM Critical Region is identified with corner markings and placard as defined in Section 3.8 and Figures 3.1 and 3.2.

(b) Perform a visual inspection of the aircraft skin in the RVSM Critical Region.

If any visible damage exists within this area, consult the Learjet 20/30 Series Aircraft Structural Repair Manual (SRM-4) for acceptable tolerances and corrective action to repair the damage. All structural repairs must be done internally.

(c) Verify that any raised placards are located outside of the RVSM Critical Area defined in Figure 3.1.

6. Verify that the autopilot maintenance and rigging checks defined in Section 3.9 have been successfully completed.

7. Perform the in-flight autopilot altitude hold check described in Section 3.10. Verify that the airplane can maintain the specified tolerance. Document the autopilot configuration by completing the form contained in Appendix A and file a copy of the signed form in the aircraft maintenance records.

Tests/Inspections (2), (3), and (4) above must be performed with the aircraft at ambient temperature (10-35°C). The aircraft does not need to be jacked or leveled to perform these inspections/tests except as noted in task (4) above. No access or inspection panels are required to be opened in order to perform these inspections and tests except as noted in task (4) above.

3.2 Owner/Operator Requirements Prior to RVSM Operational Approval

In addition to completing the inspections/tests listed in Section 3.1, the following items must be accomplished by the owner/operator in order to achieve RVSM operational approval:

1. Verify that all flight crews are familiar with operational conditions and procedures presented in the Airplane Flight Manual Supplement (AFMS) and all other contingencies necessary for the safe operation of the Learjet 24, 25, 28 and 29 Series aircraft in RVSM airspace. Flight crews should be knowledgeable of the contingency and other procedures unique to the specific areas of operation. These contingencies and procedures may be different from region to region (i.e. Domestic United States, North Atlantic, Europe, and the Pacific).

2. Verify that all maintenance personnel are trained and approved to perform the maintenance and inspections specified in this document in order to maintain and return the aircraft to service for RVSM operations.

3.3 Requirements for Continued Airworthiness

In order to maintain the RVSM compliance of the aircraft, the following inspections/tests must be completed in accordance with the schedule shown.

3.3.1 Twelve (12) Month / 300 Hour Inspection Requirements

After initial airworthiness approval has been granted, the following tasks must be performed every 300 hours or 12 months in service, whichever occurs first:

1. Verify the correct avionics components are installed in accordance with Section 2.3, Table 2.1.

2. Perform an air data system check in accordance with Section 3.6.1 using calibrated ground test equipment, and verify the air data system errors are within RVSM tolerances specified in Table 3.1. The RVSM tolerances specified in Table 3.1 will verify proper implementation of the static source error correction in the Configuration Modules (CM1 and CM2).

3. Perform a Pitot-Static Probe Inspection and Installation Angle Measurement as defined in Section 3.7 and record the results in the aircraft maintenance records. This inspection requires that the aircraft be jacked and leveled and that the rear access door be opened to verify that the aircraft is level.

NOTE: Rosemount Pitot/Static Probes shall be replaced every 10,000 flight hours.

4. Perform the following inspections for the RVSM Critical Region as defined in Section 3.8 and Figure 3.1:

   (a) Ensure that the RVSM Critical Region corner markings and placard as defined in Section 3.8, Figures 3.1 and 3.2 are in good condition.

   (b) Perform a visual inspection of the aircraft skin in the RVSM Critical Region.

   If any visible damage exists in the area specified, consult the Learjet 20/30 Series Aircraft Structural Repair Manual (SRM-4) for acceptable tolerances and corrective action to repair the damage. All structural repairs must be done internally.

   (c) Verify that any raised placards are located outside of the RVSM Critical Area as defined in Figure 3.1.

3.3.2 Twenty-Four (24) Month / 600 Hour Inspection Requirements

In addition to the Tasks required every 12 months / 300 hours in service (See Section 3.3.1), the following additional tasks must be completed every 600 hours or 24 months in service, whichever occurs first:

1. Perform the in-flight autopilot altitude hold check described in Section 3.10. Verify the airplane can maintain the specified tolerance. Document the autopilot configuration by completing the form contained in Appendix A and file a copy of the signed form in the aircraft maintenance records.
2. Perform an Isolation Valve Check per Section 13 of the Maintenance Manual Supplement (Avcon Doc. No. AI 202057).
3. For aircraft operating in EASA member states, perform the Mode 'C' and Mode 'S' transponder check described in Section 3.6.2.

3.4 Pitot-Static Probe Removal, Replacement / Rework and Repainting of RVSM Critical Region

If the pitot-static probes are removed, replaced and/or reworked or if the RVSM Critical Region is repainted, the following tasks must be completed:

1. If the pitot-static probes are removed, replaced and/or reworked perform the following:
   (a) Perform an air data system check in accordance with Section 3.6.1 using calibrated ground test equipment, and verify the air data system errors are within specified RVSM tolerances specified in Table 3.1. The RVSM tolerances specified in Table 3.1 will verify proper implementation of the static source error correction in the Configuration Modules (CM1 and CM2).
   (b) Perform a Pitot-Static Probe Inspection and Installation Angle Measurement as defined in Section 3.7 and record the results in the aircraft maintenance records. This inspection requires that the aircraft be jacked and leveled and that the rear access door be opened to verify that the aircraft is level.
2. If the RVSM Critical Region is repainted, perform the following inspections:
   (a) Ensure that the RVSM Critical Region corner markings and placard as defined in Section 3.8, Figures 3.1 and 3.2 are visible and legible.
   (b) Perform a visual inspection of the aircraft skin in the RVSM Critical Region.

   If any visible damage exists in the area specified, consult the Learjet 20/30 Series Aircraft Structural Repair Manual (SRM-4) for acceptable tolerances and corrective action to repair the damage. All structural repairs must be done internally.

(c) Verify that any raised placards are located outside of the RVSM Critical Area as defined in Figure 3.1.

3.5 Damage within the RVSM Critical Region

If damage is sustained within the RVSM Critical Region defined in Figure 3.1, repair in accordance with the procedures and practices outlined in the Learjet 20/30 Series Aircraft Maintenance Manual and/or Structural Repair Manual (SRM-4). All structural repairs must be done internally. After the repair is completed, the following tasks must be completed:

1. If the pitot-static probes are removed, replaced and/or reworked perform the tasks outlined in Section 3.4(1) of this document.

2. If the RVSM Critical Region is repainted, perform the tasks outlined in Section 3.4(2) of this document.

3.6 RVSM Maintenance Procedures

3.6.1 Air Data System Maintenance Procedures

The ADDU's and associated air data system equipment must be maintained in accordance with the manufacturer's Maintenance Manual, Airplane Maintenance Manual and appropriate regulations. However, these components must also meet the accuracy tolerances shown in Table 3.1, when installed in the aircraft as a part of the total altimetry system.

Test Procedure

Equipment Required:

Calibrated Digital Air Data Test Equipment with a combined accuracy/repeatability specification of less than ±20 ft for the test altitude range shown in Table 3.1.

This test must be performed on the aircraft using a calibrated digital air data test equipment, and is to be performed for both pilot and copilot's air data systems. Tests must be performed at ambient temperature (10° - 35° C).

1. Verify Static Port Switch is in its normal (Centered on Both) position.
2. Perform a pitot-static system leak check as described in the Avcon Maintenance Manual Supplement (AI202057, Sections 8 and 9) with the following changes:

   For static system leak test, set the air data test unit at 30,000 ft and an indicated airspeed of 200 knots. Static leak rate is not to exceed 300 ft/min.

   For the pitot system leak test, set the air data test unit to an indicated airspeed of 300 knots and vent the static pressure to ambient conditions. Pitot leak rate is not to exceed 5 knots in 5 minutes.
3. After the leak checks have been successfully completed, verify that the altitude baro indicator is set to 29.92 in. Hg (1013.25 mb).
4. Apply the reference altitude and Mach (or airspeed) for the test conditions listed in Table 3.1.
5. Record the altitude displayed by the pilot's and copilot's altimeters.
6. Verify that the indicated altitudes are within allowable tolerances.
7. Repeat steps 4 through 6 for all test conditions listed in Table 3.1.
8. File a copy of the test results with the aircraft's maintenance records.

If either the pilot or copilot's ADDU does not meet the tolerances specified in Table 3.1, see Troubleshooting Information in Section 3.11.

Table 3.1 ADDU and Altimeter Functional Test Specification for Learjet 24, 25, 28 and 29 Series Aircraft

Leak Rate:								
Condition Number	Test Set Mach Number	Test Set Airspeed (kt)	Test Set Altitude (ft)	Pilot Altitude (ft)	Copilot Altitude (ft)	Minimum Allowable Altitude (ft)	Nominal Altitude (ft)	Maximum Allowable Altitude (ft)
1	0.000	0	0			-38	0	29
2	0.150	100	0			-38	0	29
3	0.300	200	0			-38	0	29
4	0.450	300	0			-38	0	29
5	0.400	149	29,000			28962	29000	29,029
6	0.500	188	29,000			28931	28969	28,998
7	0.600	228	29,000			28903	28941	28,970
8	0.700	268	29,000			28876	28914	28,943
9	0.750	289	29,000			28883	28921	28,950
10	0.810	315	29,000			28942	28980	29,009
11	0.400	130	35,000			34962	35000	35,029
12	0.500	164	35,000			34933	34971	35,000
13	0.600	199	35,000			34906	34944	34,973
14	0.700	235	35,000			34880	34918	34,947
15	0.750	253	35,000			34887	34925	34,954
16	0.810	276	35,000			34943	34981	35,010
17	0.400	116	40,000			39962	40000	40,029
18	0.500	146	40,000			39933	39971	40,000
19	0.600	177	40,000			39906	39944	39,973
20	0.700	209	40,000			39881	39919	39,948
21	0.750	225	40,000			39888	39926	39,955
22	0.810	245	40,000			39943	39981	40,010
23	0.400	91	50,000			49962	50000	50,029
24	0.500	115	50,000			49933	49971	50,000
25	0.600	140	50,000			49906	49944	49,973
26	0.700	165	50,000			49881	49919	49,948
27	0.750	178	50,000			49888	49926	49,955
28	0.810	194	50,000			49943	49981	50,010

Air Data Test Set Information	
Manufacturer:	Model:
Serial Number:	Date of Calibration:
Accuracy Specification:	

3.6.2 Mode ‘C’ and Mode ‘S’ Transponder Maintenance

The following test procedure is applicable to aircraft operating in EASA member states, only. It is intended to show complicance with EASA AD No. 2006-0265 for transponders utilizing Gilham code altitude input.

All United States registered aircraft must continue to meet the requirements of 14 CFR Part 91.413.

The Mode ‘C’ or Mode ‘S’ transponders must be maintained in accordance with the manufacturer’s Maintenance Manual, Airplane Maintenance Manual and appropriate regulations. However, these components must also meet the accuracy tolerances shown in the following test procedure, when installed in the aircraft as a part of the total altimetry system.

Test Procedure

Equipment Required:

Calibrated Digital Air Data Test Equipment with a combined accuracy/repeatability specification of less than ±20 ft for the test altitude range shown in Table 3.1, above.

Calibrated ATC Transponder Test Equipment.

This test must be performed on the aircraft using calibrated digital air data test equipment and ATC transponder equipment, and is to be performed for both pilot and copilot’s air data systems. Tests must be performed at ambient temperature (10° - 35° C).

1. Connect air data test set to the pilot and co-pilot pitot-static system.
2. In the aircraft cockpit, select the No. 1 Mode ‘C’ or Mode ‘S’ transponder and select ADC 1.
3. Select the air data test set to the following altitude reporting values:

   1000 ft;

   4100 ft;

   15700 ft and;

   31000 ft.
4. For each selected altitude, verify that the Mode ‘C’ or Mode ‘S’ transponder altitude reporting is within tolerance (±125 ft), and record the altitude as follows:

   1000 ft = Actual reading (±125 ft)

   4100 ft = Actual reading (±125 ft)

   15700 ft = Actual reading (±125 ft)

   31000 ft = Actual reading (±125 ft)
5. In the aircraft cockpit, select ADC 2 and repeat steps 3 and 4 above.

6. In the aircraft cockpit, select the No. 2 Mode ‘C’ or Mode ‘S’ transponder, select ADC 1 and repeat steps 3 and 4 above.
7. In the aircraft cockpit, select ADC 2 and repeat steps 3 and 4 above.
8. For aircraft with Mode ‘S’ transponders installed, confirm by inspection and equipment Maintenance Manuals and Wiring Diagrams that the transponder altitude data comparator function is enabled. Using appropriate test equipment, demonstrate that the comparator detects altitude data differences between the dual encoders of more than 600 feet.
9. File a copy of the test results with the aircraft’s maintenance records.

If either transponder does not meet the tolerances specified in step 4, see Troubleshooting Information in Section 3.11.

For aircraft with Mode ‘S’ transponders installed, if the comparator function is not enabled or is unserviceable, rectify before further flight.

3.7 Pitot-Static Probe Inspection and Installation Angle Measurements

NOTE: Rosemount Pitot-Static Probes shall be replaced every 10,000 flight hours.

Section 10 of the Avcon Industries, Inc. “RVSM Modification Maintenance Manual Supplement for Learjet 20 Series”, Document No. AI202057 provides the necessary instructions for maintenance and inspection of the Rosemount Pitot-Static Probes.

Section 10 of Doc. No. AI202057 provides the following:

1. The required tooling for installation and alignment of the probes;
2. Detailed instructions to inspect and align the probes;
3. Inspection intervals; and
4. Allowable limits for deformities and/or damage to the probes.

The Rosemount Pitot-Static Probe is aligned five (5) degrees ± 0.25 degrees nose down in reference to aircraft level. Verify that the difference in probe alignment between the left-hand and right-hand probes is 0.25 degrees or less. 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 ± 0.25 degrees nose down). This inspection requires that the aircraft be jacked and leveled and must be performed at ambient temperature (10° - 35°C).

3.7.1 Mach/Overspeed Warning System Maintenance

During normal aircraft flight, the Mach/Overspeed Warning System is seldom actuated; therefore, it is recommended that the Mach/Overspeed Warning System be functionally checked at the 600 hour inspection interval in accordance with the necessary procedures for maintenance of the Mach/Overspeed Warning System found in Section 16 of the Avcon Industries, Inc. “RVSM Modification Maintenance Manual Supplement for Learjet 20 Series”, Document No. AI202057.

3.8 Visual Inspection of the Region Surrounding the Pitot-Static Probes (RVSM Critical Region)

Inspection Procedure

Equipment Required: None.

The corners of the RVSM Critical Region must be marked to make the region easily identifiable. The size, shape and color of the markings are to be determined by the organization installing the markings, with the only requirement being that they are recognizable and understandable to an individual performing the inspections.

Figure 3.1 defines the RVSM Critical Region. The RVSM Critical Region extends 18 inches forward, and 12 inches above, below, and behind each pitot-static probe. A placard, as shown in Figure 3.2, with the following wording must be installed on the aircraft as shown in Figure 3.1:

> Modifications to the Exterior of the
> Aircraft May Affect RVSM Certification.
> Refer to Avcon Industries Doc. No.
> AI 202045 for Requirements.

Prior to all flights, the flight crew must visually inspect the RVSM Critical Region for obvious damage or deformation, such as paint chips, creases, dents or bulges in the skin or non-flush or missing fasteners due to foreign object damage, service vehicles, etc. The pitot-static probes must be inspected for corrosion or deformation and the flight crew must ensure that no foreign matter is found within the port orifices.

If damage or surface irregularities are found within the RVSM Critical Region, verify that the damage is less than the tolerances specified in the Structural Repair Manual prior to RVSM operations. If damage is outside the Structural Repair Manual limits, repair the damage in accordance with the practices and procedures outlined in the Learjet 20/30 Series Aircraft Maintenance Manual and/or Structural Repair Manual. After the repair is completed, perform the tasks and inspections outlined in Section 3.5 prior to RVSM operations.

If damage or surface irregularities are found on the pitot-static probe, verify that the damage is less than the tolerances specified in the Avcon Industries, Inc. “RVSM Modification Maintenance Manual Supplement for Learjet 20 Series”, Doc. No. AI202057. If damage is outside the limits, replace the probe in accordance with the practices and procedures outlined in Avcon Doc. No. AI202057. After the repair is completed, perform the tasks and inspections outlined in Section 3.5 prior to flight operations.

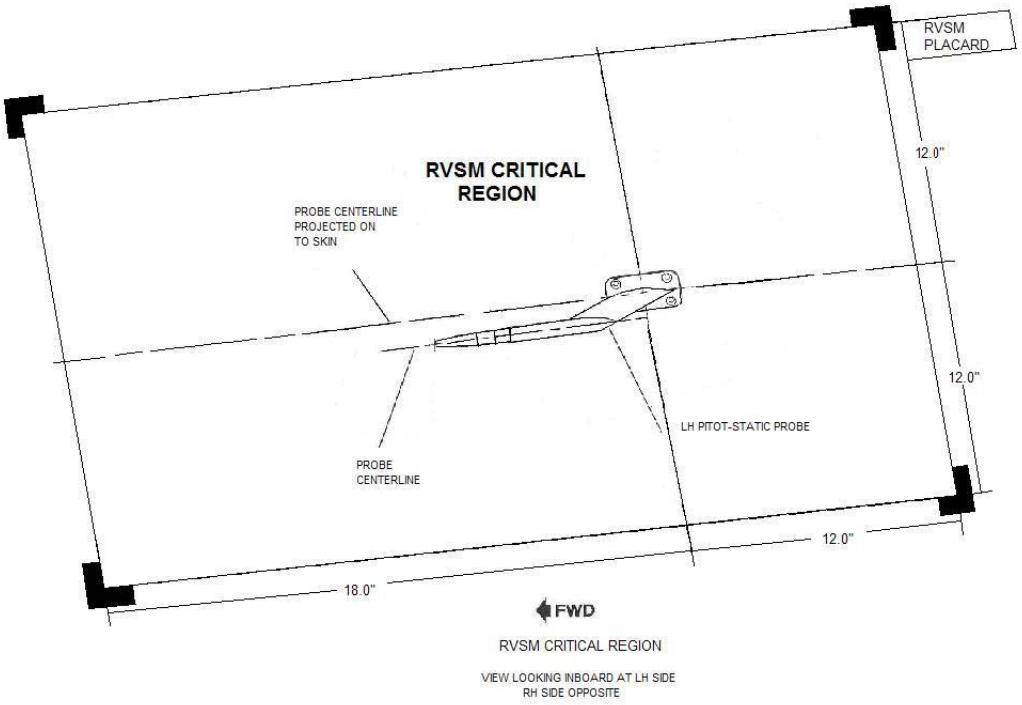

Figure 3.1 RVSM Critical Region Definition, Left Side Shown

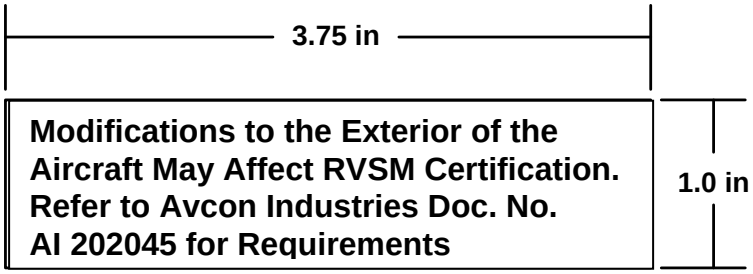

Figure 3.2 RVSM Critical Region Placard

3.9 Autopilot Maintenance and Rigging Checks

The Avcon Industries, Inc. “RVSM Modification Maintenance Manual Supplement for the Learjet 20 Series”, Document Number AI202057, Rev B, dated 25 September 2003, or latest approved version provides detailed instructions that need to be performed for the maintenance/testing of the autopilot. See Sections 9 and 15 of Doc. No. AI202057 for autopilot checks related to RVSM. There are no special mechanical requirements for autopilot maintenance. To the extent that any abnormality may exist, have the flight computer tested by an authorized repair facility. The autopilot computer is specific to the aircraft. Do not use an autopilot computer that has not been configured for the applicable aircraft. Document the autopilot configuration by completing the form contained in Appendix A and file a copy of the signed form in the aircraft maintenance records.

Avcon Doc. No. AI202057 provides instructions for maintenance of the flight controls/ autopilot rigging. See Section 15 of Avcon Doc. No. AI202057 for detailed instructions. The autopilot computer and controller must be sent out and inspected in accordance with Avcon Industries “RVSM Installation Manual”, Doc. No. AI 202056, Rev. IR, dated August 13, 2003, or latest approved version during the initial airworthiness checks performed in accordance with Section 3.1 of this document. The aircraft must be rigged in accordance with the specifications of the applicable Learjet Maintenance Manual.

3.10 Autopilot (Altitude Hold) Performance Test

RVSM operation requires that the autopilot system accurately maintains the assigned altitude during non-turbulent, non-gusty cruise flight. Perform the following in-flight altitude hold performance test every twenty-four (24) months. If the aircraft fails to hold altitude to the tolerances specified, see Troubleshooting Information Section 3.11.

Test Procedure

Equipment Required: None.

During normal RVSM cruise flight (at an altitude between FL290 and FL410, Baro settings of 29.92 in Hg or 1013 mb and non-turbulent, non-gusty conditions) and with the autopilot/altitude hold engaged, record the data from the primary displays (using Table 3.2) every 5 minutes for a flight segment of at least 30 minutes in length. The maximum altitude deviation shown on the display should not exceed ±65 ft of the acquired altitude.

Table 3.2 RVSM Autopilot Performance Check Table, Learjet 24,25, 28 and 29 Series Aircraft Cruise Conditions

Airplane / Destination:				Date:			
Pilot:				Copilot:			
Time (hr:min)	Pilot's Altimeter	Copilot's Altimeter	Standby Altimeter	Pilot's Mach	Copilot's Mach	Pilot's Airspeed	Copilot's Airspeed
0:00							
0:05							
0:10							
0:15							
0:20							
0:25							
0:30							
0:35							
0:40							
0:45							
0:50							
0:55							
1:00							

3.11 Troubleshooting Information

The following information provides troubleshooting information and instructions for corrective action upon failure of the RVSM Air Data System, its associated components and/or the inspections/tests presented in this document.

3.11.1 Air Data System

If the air data system is found to exceed the requirements of Table 3.1, service the pitot-static system in accordance with the maintenance manual. Check and drain the pitot-static lines, perform a leak check (using the leak rate tolerance specified in Section 3.6.1 of this document, and repeat the RVSM air data ground test in accordance with the procedures provided in Section 3.6.1 of this document. If the requirements of Table 3.1 are again exceeded, service the ADDU's and/or altimeters per the manufacturer's service requirements. The serviced units must be re-tested upon re-installation in the airplane per the requirements of Section 3.6.1 of this document.

3.11.2 RVSM Critical Region Inspection

If a visual inspection of the RVSM Critical Region defined in Section 3.8 and Figure 3.1 of this document indicates that damage, deformation, repairs, etc. exists that may impact air data system accuracy, then RVSM operations are not permitted and the operator should perform inspection/repairs per the maintenance and/or structural repair manuals.

3.11.3 Pitot-Static Probe Inspection

If the pitot-static probe condition fails any of the inspections defined in Section 3.7 of this document, service or replace the pitot-static probe as specified. If the pitot-static probe installation angles are measured as defined in Section 3.7 and found to be out of tolerance, readjust the probes alignment and repeat the measurement process. If the probes are still outside the allowable installation angle tolerances, the performance of the probes must be re-evaluated on a system level, to determine basic airworthiness compliance. Contact Avcon Industries for assistance.

3.11.4 Autopilot (Altitude Hold) Check

If the aircraft cannot maintain altitude to within ±65 ft from the acquired cruise altitude with the autopilot altitude hold engaged, repeat the autopilot check per Section 3.10 of this document ensuring the Mach number remains constant and the air remains stable during the entire check. If the aircraft still fails this check, perform autopilot component and/or servicing checks as specified in Section 3.9 of this document. Repeat the test in accordance with Section 3.10 of this document, as required, ensuring the altitude hold accuracy is maintained.

3.11.5 Mode ‘C’ and Mode ‘S’ Transponder Check

This section applies to aircraft operated in EASA member states, only.

If either transponder is found to exceed the requirements of Section 3.6.2, swap the No. 1 transponder and the No. 2 transponder and repeat steps 3 and 4 of the test with the ADC and transponder selected to the failed configuration.

1. If the requirements of Section 3.6.2 are again exceeded, service the ADDU and associated wiring per the manufacturer’s service requirements. The serviced unit must be re-tested upon re-installation in the aircraft per the requirements of Section 3.6.2 of this document.

2. If the requirements of Section 3.6.2 are met, service the transponder and associated wiring per the manufacturer’s requirements. The serviced unit must be re-tested upon re-installation in the aircraft per the requirements of Section 3.6.2 of this document.

3.12 Installation/Removal of RVSM-Relevant Components

Installation and/or removal of all avionics equipment should be performed in accordance with current maintenance practices. An air data systems check as defined in Section 3.6 of this document shall be performed upon removal and/or installation of an ADDU. A static leak check, per the Maintenance Manual Supplement (AI 202057), must be accomplished any time an ADDU or the Standby Altimeter is removed and replaced as well as any time a static or pitot line connection is loosened.

4 Summary of Operational Requirements and Conditions

The Learjet 24, 25, 28 and 29 Series aircraft must incorporate the required operational conditions and special flight crew training to ensure compliance with RVSM altimetry system accuracy and integrity requirements during RVSM operations.

4.1 Pre-Flight Inspection of the RVSM Critical Region

A pre-flight inspection of the RVSM Critical Region is required prior to flight operations. This preflight inspection is contained in the Airplane Flight Manual Supplement.

4.2 ADDU1 or ADDU2 Failure

In case of ADDU1 or ADDU2 failure, a series of steps must be taken by the pilot to ensure the airplane can appropriately maintain altitude for the remainder of the flight. These steps are summarized in the AFM supplement.

4.3 Detection of Dual Altitude Display Fault

To ensure a dual display fault in the air data system remains detectable, the pilot shall note the difference between the primary altimeters, and the difference between each primary altimeter and the standby altimeter, prior to entry into RVSM airspace. The pilot should also note the airspeed/Mach number.

During RVSM operations, at intervals of one hour, a cross-check between the primary altimeters and the standby altimeter must be performed. The two primary altimeters must agree within ±200 ft. Failure to meet the ±200 ft tolerance requires the initiation of the appropriate RVSM contingency procedures. Table 4.1 may be used to record these altitude comparison data. The difference between the altitude displayed on each of the primary altimeters and the standby altimeter should remain constant at a constant Mach number.

Table 4.1 Altimeter Display Tracking Form

Date:				Flight Crew:		
Departure:				Destination:		
Time (Hours)	Time (GMT)	Pilot Mach	Pilot Alt	Copilot Mach	Copilot Alt	Standby Alt
Initial RVSM Altitude						
1						
2						
3						
4						

4.4 Flight Crew Training

Verify that all flight crews are familiar with operational conditions and procedures presented in the Airplane Flight Manual Supplement (AFMS) and all other contingencies necessary for the safe operation of the Learjet 24, 25, 28 and 29 Series aircraft within RVSM airspace. Flight crews should be knowledgeable on the contingency and other procedures unique to the specific areas of operation. These contingencies and procedures may be different from region to region (i.e. Domestic United States, North Atlantic, Europe, and the Pacific). The operations manual should be revised to include these RVSM-specific limitations and/or procedures, if necessary.

Learjet Model 24, 25, 28 and 29 Series Aircraft
Autopilot Inspection Form

Aircraft Model _____
Aircraft Serial Number _____

The installed JET FC-110 autopilot components listed below have been verified against JET Document Nos. TP 203, TP 231, and TP 314 for autopilot configuration and aircraft modification status. These components have been tested to show compliance with the applicable requirements of Avcon Industries STC No. ST01195WI.

JET FC-110 Autopilot	P/N	S/N
Amplifier		
Controller		

Any changes to the aircraft modification status affecting the autopilot or changes to the autopilot configuration will require additional testing by Avcon Industries to show compliance with STC No. ST01195WI.

Approved by: _____ Date: _____
Inspection Department
Avcon Industries, Inc.