INSTRUCTIONS for CONTINUED AIRWORTHINESS for the CESSNA MODEL S550 CITATION S/II AIRCRAFT EQUIPPED WITH an RVSM AIR DATA SYSTEM AND DUAL FLIGHT DIRECTORS and QUALIFIED for OPERATIONS in RVSM AIRSPACE

FAA STC Number STC ST02642AT

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Approved By: B. Culberson **Date:** 3/16/09

RECORD OF REVISIONS

Rev	Date	Pages Affected	Description Of Revision	Approvals
IR	06/11/04	All	New Document	Prepared By: E. Weaver Checked By: G. Fischer Approved By: B. Culberson
A	12/12/05	6, 7, 8, 11, 22, 24, 29, and 33	Updated Sections 1.3, 1.4, 2, 3.8.1, 3.8.3, 3.11.2; Updated Figures 1, 8, and 12; and Updated Table 2-1 to provide coverage for the IADDU update.	Prepared By: D. Babcock Checked By: J. Serafin Approved By: E. Weaver
B	8/6/08	5 15 19 21	Section 1.2; added “equipped with dual flight directors” for clarification. Section 3.4; edited equation 2. Section 3.6; revised first and last paragraphs for clarification. Section 3.7; added “of the acquired altitude” to last sentence of last paragraph.	Prepared By: B. Wigfield Checked By: E. Weaver Approved By: B. Culberson
C	See front sheet	10	Added statement regarding FJ44-3A engines.	Prepared By: See front sheet Checked By: See front sheet Approved By: See front sheet

PLACEMENT OF INITIAL ISSUES AND REVISIONS

Revisions of documents are distributed to the same personnel and locations as the original issues. Every copy of a revised document is distributed with a coversheet or rev block that contains a brief description of what has been changed and what is new. The cover sheet also contains a note instructing the recipient to remove and destroy the old, superseded version of the document. Maintaining unauthorized files with superseded revisions of controlled documents is prohibited.

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1 INTRODUCTION

1.1 Purpose and Scope

This document provides instructions for the continued airworthiness of the Cessna Model S550 Citation SII aircraft with the RVSM (Reduced Vertical Separation Minimums) Air Data System installation defined by Star Aviation MDL R-34-Y29-0141, and equipped with the SPZ 500 Autopilot System and dual flight directors.

The Cessna Model S550 Citation SII aircraft have been shown to qualify for operations in RVSM airspace as group airplanes based on analysis of the configuration and performance of the air data, the automatic altitude control, the altitude alerting and the altitude reporting systems. These systems must be maintained in accordance with this document and other current maintenance practices, to guarantee initial and continued compliance to RVSM specifications. Revisions/changes to the Instructions for Continued Airworthiness will be distributed in accordance with Star Aviation Inc. Operational Procedures SAS-0502.

Prior to applying for RVSM operational approval, the operator of each Cessna Model S550 Citation SII aircraft must first conduct the inspections, tests, and all other requirements for initial airworthiness compliance as presented in Section 3.1 of this document. The operator 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 3.2 of this document.

1.2 Applicability

This document is applicable to all Cessna Model S550 Citation SII aircraft equipped with dual flight directors modified in accordance with STC ST02642AT. Star Aviation drawing D-34-Y29-0348 - RVSM Air Data System on Cessna Citation 500 Series, provides a listing of those aircraft that have been modified in accordance with STC ST02642AT.

1.3 Abbreviations;

Abbreviation	Definition
14 CFR	Title 14 of the code of Federal Regulations
ADDU	Air Data Display Unit
AIU	Analog Interface Unit
ESD	Electro Static Discharge
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FSDO	Flight Standards District Office
IADDU	Integrated Air Data Display Unit
MDL	Master Data List
RVSM	Reduced Vertical Separation Minimum
STC	Supplemental Type Certificate
TC	Type Certificate

1.4 References

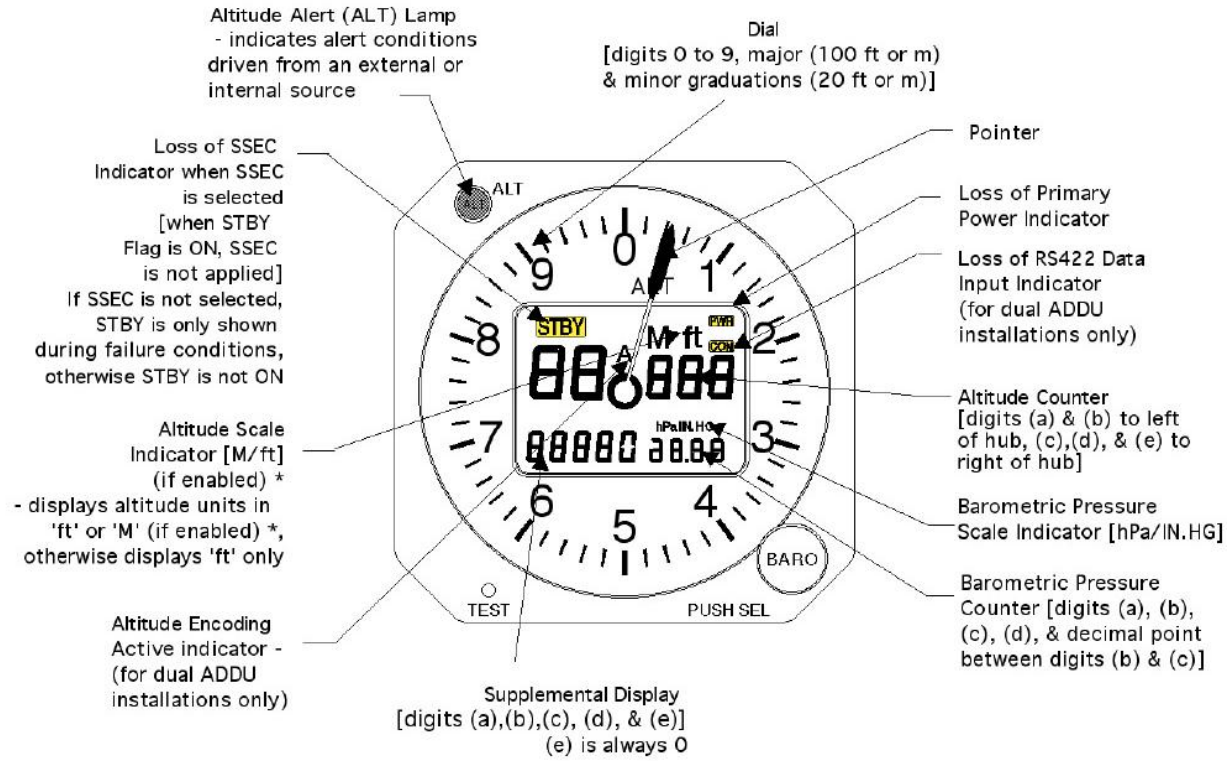
1. Master Data List for the RVSM Air Data System on Cessna Citation 500 Series Aircraft; Document no. R-34-Y29-0141.
2. Weight and Balance report for RVSM Installation on Cessna Citation 500 Series with Dual Flight Director; Document no. R-34-Y29-0147.
3. Structural Substantiation Report for RVSM Equipment Installation on Cessna Citation 500 Series Aircraft (Dual AIU); Document no. R-53-Y29-0150.
4. Operational Test for RVSM Air Data System on Cessna S550 Citation S/II Aircraft; Document no. R34-0226.
5. FAR reference; 14 CFR part 25, section 25.1529 – Instructions for Continued Airworthiness.
6. Innovative Solutions & Support Manual 1D-81040-26; Operation and Installation Manual, Analog Interface Unit (AIU).
7. Innovative Solutions & Support Manual 1D-80130-16; Operation and Installation Manual, Air Data Display Unit (ADDU).
8. Cessna Model S550 Citation SII Maintenance Manual.
9. Innovative Solutions & Support Manual 1D-80170-2; Operation and Installation Manual, Integrated Air Data Display Unit (IADDU).

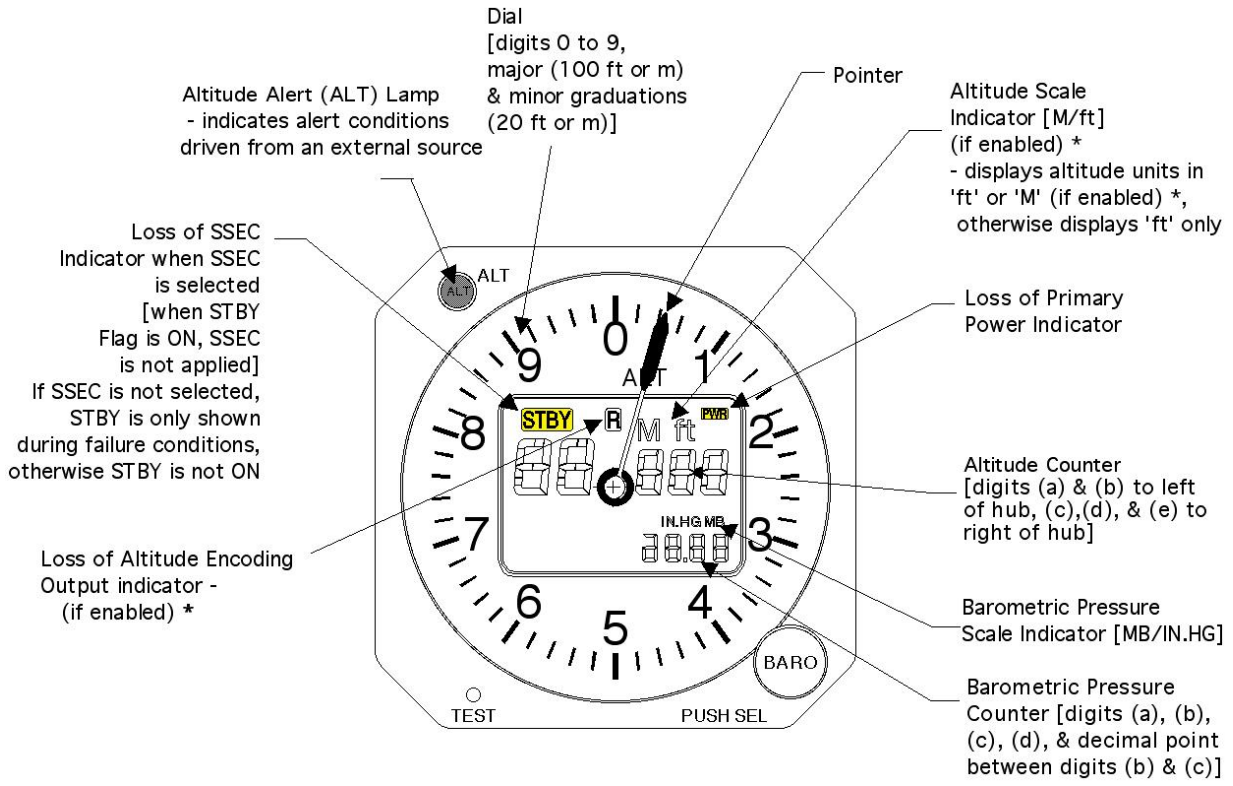
2 SYSTEM DESCRIPTION

The Cessna Model S550 Citation S/II aircraft are equipped with two independent altimetry systems comprised of independent, cross-coupled static sources located on the left and right sides of the fuselage and air-data computers/altimeters. The aircraft are also equipped with single autopilot and altitude alerting installations and two altitude-reporting transponders. The installation and operation of these systems have been shown to meet RVSM requirements.

NOTE: The system will have either ADDU's or IADDU's installed. The ADDU's and IADDU's themselves are NOT interchangeable. The term "ADDU" will be used generically through this document and is to be taken as synonymous with IADDU unless otherwise specified.

The RVSM Air Data System installation on the Cessna Model S550 Citation S/II aircraft provides the crew indication of altitude. The pilot's and first officer's traditional altimeters are replaced with new RVSM compliant Air Data Display Units (ADDU's). These units provide the crew with visual indication of altitude with a traditional pointer and digital LCD display. The ADDU's also provide altitude data in the form of Gray Code to the ATC Transponders. See Figure 1 for a depiction of the ADDU display. See Reference 7 for a detailed component level ADDU description (Reference 9 for IADDU).





***Note: These displays above will only be shown if enabled.**

Figure 1: ADDU (Top) / IADDU (Bottom) Display

The ADDU's interface to an Analogue Interface Units (AIU's) installed in the forward avionics rack in the nose of the aircraft. See Figure 2. See Reference 6 for a detailed component level AIU description.

The AIU's receive digital RS422 altitude data from the ADDU's. The AIU's processes this data and provide outputs to the following avionics sub-systems:

- Flight Directors
- VNAV Controller/Altitude Alerter
- Autopilot

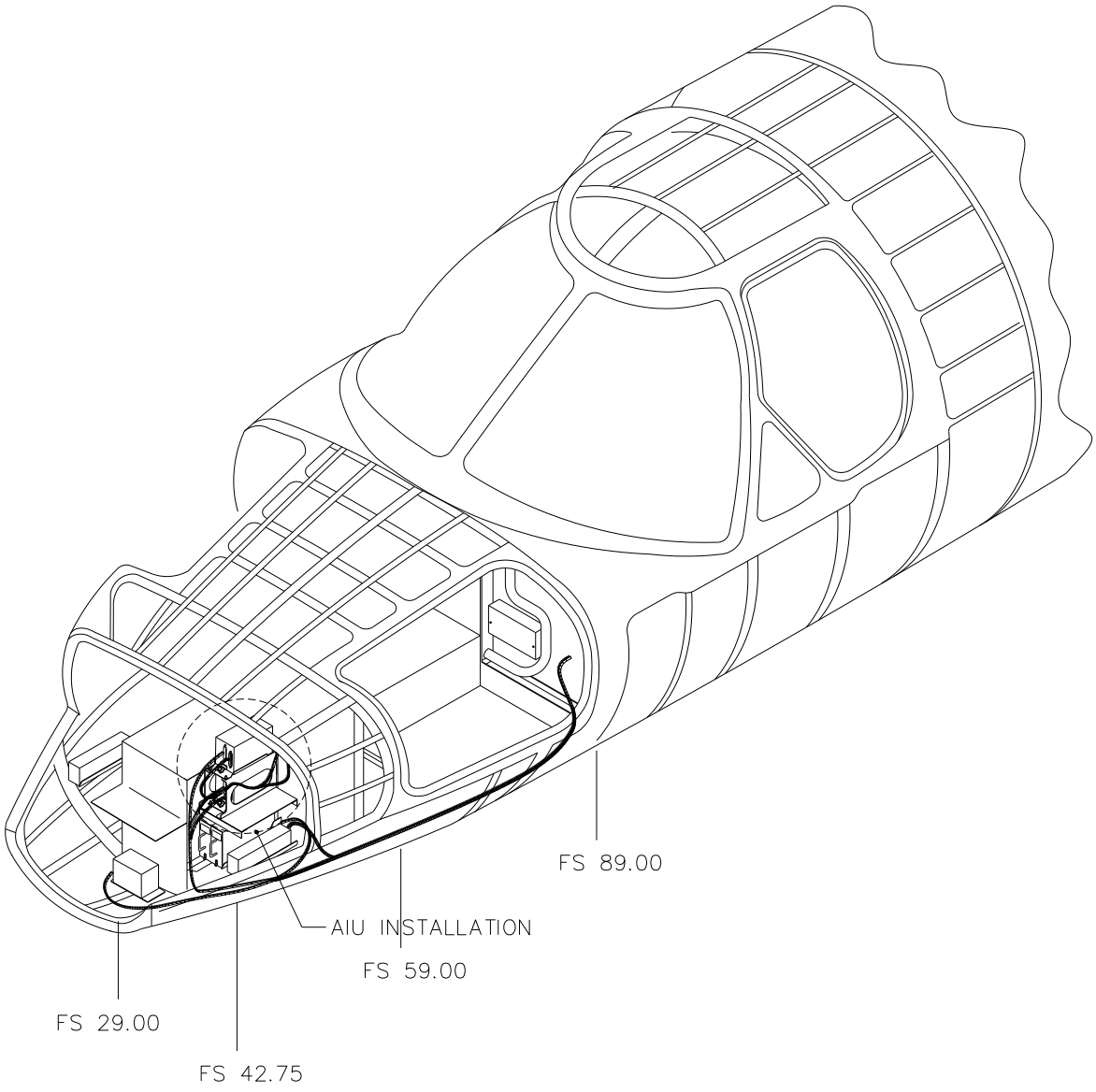


Figure 2: AIU Installation

The RVSM Air Data System is a dual ADDU / AIU system. Outputs from the AIU's to the other avionics sub-systems can be switched from ADC 1 (utilizes ADDU 1) to ADC 2 (utilizes ADDU 2) using the ADC SYS SELECT switch indicator installed on the First Officers instrument panel. See Figure 3.

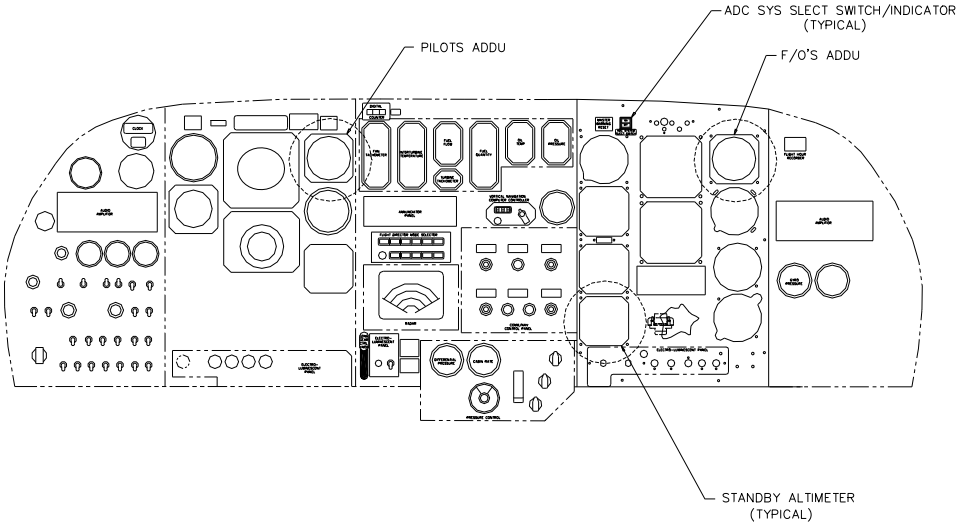


Figure 3: Instrument Panel

The Cessna Model S550 Citation S/II aircraft is equipped with two JT15D-4B engines, and are certified to operate up to FL430 and M_{MO}=0.72. Any future engine changes/modification, including hush kits, may affect RVSM performance, and hence, these instructions. Contact Star Aviation, Inc. if any engine changes/modifications are, or shall be, conducted.

It has been shown that FJ44-3A engines installed in accordance with STC ST09559AC are compatible with this STC, **provided the TAT probes are installed at FS 81 or aft and between the wheel well wall and the first stringer aft of the wheel well wall.**

Cessna aircraft which have been equipped with STC modifications which do not change the aerodynamics of the aircraft forward of the static ports, cause a change to the Altimeter Position Correction Chart, or increase the level flight performance capability beyond 0.72M can be qualified for RVSM Operation under this STC without any additional requirements.

The aircraft system components approved for RVSM operations on the Cessna Model S550 Citation S/II aircraft are presented in Table 2-1. These components must be maintained in accordance with the continued airworthiness instructions presented in this document. RVSM group compliance for the Cessna Model S550 Citation S/II aircraft was demonstrated with the following antennas installed:

- A flight phone antenna (typically 7.0 inches tall or less) located at FS 62.0 on the right hand side of the aircraft,
- An L-Band antenna (typically 3.5 inches tall or less) located at FS 76.5 on the left hand side of the aircraft,
- An L-Band antenna (typically 3.5 inches tall or less) located at FS 58.0 on the left hand side of the aircraft, and
- Pitot probes (P/N PH502) located at FS 34.5 on both the left and right hand sides of the aircraft.

Contact Star Aviation, Inc. prior to the installation of any additional antennas forward of the static ports as installation of additional antennas may invalidate the RVSM certification for these aircraft.

The following equipment must be installed and operational to enter RVSM airspace:

Description	Manufacturer	Model	Part Number
Air Data Display Unit #1 (ADDU1) **OR** Integrated Air Data Display Unit #1 (IADDU1) (5)	IS&S	ADDU / IADDU	9D-80130-16 or 9D-80170-2
Air Data Display Unit #2 (ADDU2) **OR** Integrated Air Data Display Unit #2 (IADDU2) (5)	IS&S	ADDU / IADDU	9D-80130-16 or 9D-80170-2
Analog Interface Unit #1 (AIU1)	IS&S	AIU	9B-81040-26
Analog Interface Unit #2 (AIU2)	IS&S	AIU	9B-81040-26
Configuration Module #1 (CM1) (1) (5) Configuration Module #1 (CM1) (1) (5)	IS&S	CM	9B-03508-113 Mod A / 9B-06017-5
Configuration Module #2 (CM2) (1) (5) Configuration Module #2 (CM2) (1) (5)	IS&S	CM	9B-03508-113 Mod A / 9B-06017-5
Transponder #1 & #2 (2) (3)	As Noted	As Noted	As Noted
Autopilot Computer	Honeywell	SP-200	4008519-945
Flight Director Computer	Honeywell	FZ-500	4018369-905
Altitude Alerter	Honeywell	VN-212	4020571-904
Standby Altimeter (4)	As Noted	As Noted	As Noted

Table 2-1
Avionics and Air Data System Components Required for RVSM Operations, Cessna Model S550 Aircraft

NOTES

1. When the IS&S Configuration Module is correctly installed, the Air Data Display Units (ADDU) will display “C5.60” at start-up. If either ADDU does not display “C5.60” 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) may be substituted for those listed. TSO-C74c (Mode C) or TSO-C112 (Class 2a; Mode S).
3. If only one transponder is operational, it must be capable of reporting from either the pilot’s or copilot’s ADDU.
4. For RVSM operations, a standby altimeter that meets or exceeds the requirements of TSO-C10b must be installed.
5. ADDU’s and IADDU’s are not interchangeable. Also ADDU’s and IADDU’s are paired with their respective (part number) configurations module and are not interchangeable.

Any deviation from this equipment list (except as noted) invalidates RVSM approval of this aircraft and 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 and compliance must be conducted and approved.

3 MAINTENANCE

The installation of the RVSM Air Data System and qualification for approval for operations in the RVSM airspace necessitates that the following inspections, tests and/or procedures be incorporated into the operator's regular scheduled maintenance program at an interval not to exceed operator's annual inspection interval requirements and that the aircraft be maintained in accordance the instructions provided in this section.

NOTE: The information presented in this section supplements or supersedes the basic airplane manuals only in those areas specified. For all cases in which this document and the aircraft maintenance manual are in conflict the instructions contained herein take precedence. 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.

A detailed visual inspection is defined as;
An intensive examination of a specific structural area, system, installation or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate by the inspector. Inspection aides such as mirrors, magnifying lenses, etc. may be used. Surface cleaning and elaborate access procedures may be required.

A general visual inspection is defined as;
A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure, or irregularity. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight, or drop light and may require removal or opening of access panels or doors. Stands, ladders, or platforms may be required to gain proximity to area checked.

3.1 Servicing Information for Initial Airworthiness

1. The following procedures, inspections and tests are required for RVSM initial airworthiness approval:

   a. Implement the static port refinishing process specified in Appendix B, of Star Aviation Report No. R34-0222 "Reduced Vertical Separation Minimum (RVSM) Skin Waviness Inspection Procedures For The Cessna Model 560 and S550 Citation Aircraft", Rev B dated 9 March 2004 or later approved revision.

   b. Map the skin of the aircraft in the RVSM Critical Region as specified in Star Aviation Report No. R34-0222 "Reduced Vertical Separation Minimum (RVSM) Skin Waviness Inspection Procedures For The Cessna Model 560 and S550 Citation Aircraft", Rev B dated 9 March 2004 or later approved revision. Once the skin is mapped the results should be compared with the tolerances in Section 3.4, Table 3-1. If the aircraft exceeds the allowances in Table 3-1 contact Star Aviation, Inc.

   c. Install the RVSM Air Data System defined by Star Aviation MDL R-34-Y29-0141 and verify that, in accordance with Table 2-1, the correct avionics components are installed.

   d. Conduct the air data system accuracy check defined in Section 3.5 using calibrated ground test equipment and verify that the air data system errors are within the RVSM tolerances specified in Table 3-2.

   e. Conduct the following inspections for the RVSM Critical Region.

      1. Mark the RVSM Critical Region defined in Section 3.6 and Figure 4. Place the RVSM modification compliance Placard on the aircraft as defined in Section 3.6 and Figures 4 and 5.

      2. Conduct a detailed visual inspection of the region and verify the absence of skin waviness, scratches and damage in the entire region.

3. Verify the entire inspection area meets all criteria found in the Cessna Model S550 Structural Repair Manual, Chapter 51-00-03, Aerodynamic Surfaces - Description. Repair any discrepancies found using standard procedures found in the Structural Repair Manual. If any repairs are made, complete the tasks required in Section 3.4.

4. Verify that all placards or stencils are located outside of the RVSM Critical Area defined in Figure 4.

f. Conduct the in-flight autopilot altitude hold check described in Section 3.7 to verify that the airplane can maintain the specified tolerance.

Inspections 1.b, 1.d and 1.e must be conducted at ambient temperature (50^0 to 95^0F). The aircraft does not need to be jacked or leveled to conduct these inspections.

2. The following items must be accomplished by the owner/operator in order to achieve RVSM operational approval:

a. 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 Cessna Model S550 Citation S/II aircraft in RVSM airspace. Note that RVSM-specific airspace procedures (contingencies and other such protocols) may differ from region to region (i.e. Europe, North Atlantic, Pacific).

b. Verify that all maintenance personnel are trained and approved to perform the maintenance and inspections necessary to maintain and return the aircraft to service for RVSM operations.

3.2 Servicing Information for Continued Airworthiness

3.2.1 Twelve (12) Month Inspection Requirements

After initial airworthiness approval has been granted, the following inspections and tests along with those defined in Section 4 must be conducted every 12 months in service:

1. Verify the correct avionics components are installed in accordance with Table 2-1.

2. Conduct the air data system accuracy check presented in Section 3.5 using calibrated ground test equipment and verify that the air data system errors are within the RVSM tolerances specified in Table 3-2.

3. Conduct the following inspections for the RVSM critical region:
   a. Verify that the RVSM Critical Region corner markings as defined in Section 3.6 and Figure 4 are discernable and in good condition. Verify that the RVSM modification compliance Placard as defined in Section 3.6 and Figure 5 is in place and readable.

   b. Conduct a detailed visual inspection of the region and verify the absence of waviness, scratches, damage within the entire region.

   c. Verify that the entire inspection area meets all criteria found in the Cessna 500 Series Structural Repair Manual, Chapter 51-00-03, Aerodynamic Surfaces - Description. Repair any discrepancies found using standard procedures found in the Structural Repair Manual. If any repairs are made, complete the tasks required in Section 3.4.

   d. Verify that all placards or stencils are located outside of the RVSM Critical Area defined in Figure 4.

3.2.2 Twenty Four (24) Month Inspection Requirements

In addition to the Tasks required every 12 months in service, the following additional task must be completed every 24 months in service:

- Conduct the in-flight autopilot altitude hold check described in Section 3.1.3. Verify the airplane can maintain the specified tolerance.

3.3 Repainting Of/Or Damage To The RVSM Critical Region

If the RVSM Critical Region (defined in Figure 4) is repainted or damage is sustained to this region that results in any defect greater than 10 % of the sheet thickness (Cessna Model S550 Structural Repair Manual, Chapter 51-10-01, Section 2.A.(1)) repair as specified. After the repair is completed, the following tasks must be completed:

1. Implement the static port refinishing process specified in Appendix B, of Star Aviation Report No. R34-0222 “Reduced Vertical Separation Minimum (RVSM) Skin Waviness Inspection Procedures for The Cessna Model 560 and S550 Citation Aircraft”, Rev B dated 9 March 2004 or later approved revision.

2. Map the skin of the aircraft in the RVSM Critical Region as specified in Star Aviation Report No. R34-0222 “Reduced Vertical Separation Minimum (RVSM) Skin Waviness Inspection Procedures for The Cessna Model 560 and S550 Citation Aircraft”, Rev B dated 9 March 2004 or later approved revision. Once the skin is mapped, the results should be compared with the tolerances specified in Table 3-1. If the aircraft exceeds the tolerances in Table 3-1, contact Star Aviation, Inc.

3. Conduct the air data system accuracy check presented in Section 3.5 using calibrated ground test equipment, and verify the air data system errors are within the RVSM tolerances specified in Table 3-2.

4. Conduct the following inspections for the RVSM critical region:

    a. Mark the RVSM Critical Region defined in Section 3.6 and Figure 4. Place the RVSM modification compliance Placard on the aircraft as defined in Section 3.6 and Figure 4.

    b. Conduct a detailed visual inspection of the region and verify the absence of skin waviness, scratches, damage within the entire region.

    c. Verify that the entire inspection area meets all criteria found in the Cessna Model S550 Structural Repair Manual, Chapter 51-00-03, Aerodynamic Surfaces - Description. If any discrepancies are found, repair the discrepancy using standard procedures found in the Structural Repair Manual and repeat the Tasks outlined in this section.

    d. Verify that any placards or stencils are located outside of the RVSM Critical Area defined in Figure 4.

3.4 Skin Contour Requirements

The skin mapping procedures and locations at which the skin contour measurements will be taken for the Cessna Model S550 Citation S/II aircraft are defined in Star Aviation Report No. R34-0222 “Reduced Vertical Separation Minimum (RVSM) Skin Waviness Inspection Procedures for The Cessna Model 560 and S550 Citation Aircraft”, Rev B dated 9 March 2004 or later approved revision. Table 3-1 defines the minimum and maximum allowable thickness for each horizontal skin contour grid line, including the skin overlap and Button step height. The data collected during the skin mapping procedure must fall within the tolerances specified in Table 3-1. The minimum and maximum allowable changes in the thickness for adjacent locations along a given skin contour grid line are also given in Table 3-1.

The change in thickness is defined in Equation 1.

$$\Delta\text{Thickness} = \text{Thickness}_{\text{forward}} - \text{Thickness}_{\text{aft}} \quad (1)$$

The smaller location numbers are defined as aft. An example of this calculation is shown in Equation 2.

$$\Delta\text{Thickness}_1 = \text{Thickness}_2 - \text{Thickness}_1 \quad (2)$$

Horizontal Grid Reference	A/C Side	Grid Row Values		Slope Change	
		Minimum	Maximum	Minimum	Maximum
5.0 Upper	Left	-0.0170	0.0145	-0.0105	0.0065
	Right	-0.0190	0.0110	-0.0095	0.0110
4.0	Left	-0.0095	0.0260	-0.0105	0.0105
	Right	-0.0145	0.0270	-0.0110	0.0120
3.0	Left	-0.0145	0.0315	-0.0165	0.0205
	Right	-0.0070	0.0405	-0.0115	0.0145
2.0	Left	-0.0180	0.0360	-0.0145	0.0165
	Right	-0.0125	0.0515	-0.0115	0.0195
1.0	Left	-0.0225	0.0600	-0.0460	0.0525
	Right	-0.0155	0.0680	-0.0480	0.0635
0.0	Left	-0.0145	0.0370	-0.0165	0.0270
	Right	-0.0145	0.0480	-0.0080	0.0330
-1.0	Left	-0.0225	0.0665	-0.0465	0.0600
	Right	-0.0180	0.0665	-0.0375	0.0580
-2.0	Left	-0.0120	0.0270	-0.0090	0.0150
	Right	-0.0085	0.0250	-0.0115	0.0135
-3.0	Left	-0.0115	0.0295	-0.0130	0.0065
	Right	0.0035	0.0345	-0.0120	0.0225
Skin Overlay	Left	-0.0595	-0.0120	-0.0150	0.0175
	Right	-0.0450	-0.0140	-0.0110	0.0155
-4.0	Left	-0.0200	0.0115	-0.0050	0.0125
	Right	-0.0215	0.0315	-0.0180	0.0185
-5.0 Lower	Left	-0.0105	0.0225	-0.0080	0.0145
	Right	-0.0140	0.0490	-0.0100	0.0205

A/C Side	Button Step Height			
	Upper		Lower	
	Minimum	Maximum	Minimum	Maximum
Left	-0.0575	-0.0135	-0.0555	-0.0190
Right	-0.0615	-0.0055	-0.0570	0.0060

Table 3-1
Skin Contour Grid Lines, Skin Overlay and Button Step Height Inspection Tolerances

3.5 Air Data System Accuracy Check

The aircraft's pitot/static systems and the RVSM Air Data System must be maintained in accordance with the manufacturer's maintenance manuals, the airplane maintenance manual and the required regulations. However, these components must also meet the accuracy tolerances shown in Table 3-2. Refer to Section 3.8.1 for Air Data System Troubleshooting if the RVSM Air Data System fails any portion of this test.

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 3-2.

This test is to be performed for both Pilot's and Copilot's air data systems.

1. Perform a pitot-static system leak check as described in the Maintenance Manual, Except for the static leak check, set the air data test unit at 30,000 feet and an indicated airspeed of 200 knots. Leak rate is not to exceed 300 feet/min.
2. Verify that the altitude indicator baro is set to 29.92 in Hg (1013.25 mb).
3. Apply the reference altitude and Mach (or airspeed) for the test condition.
4. Record the altitude displayed by the Pilot's and Copilot's altimeters.
5. Verify that the indicated altitudes are within allowable tolerances.
6. Repeat steps 3 through 5 for all test conditions listed in Table 3-2.
7. File the results with the aircraft maintenance records.

Condition Number	Test Set Mach Number	Test Set Airspeed (kt)	Test Set Altitude (ft)	Nominal Altitude (ft)	Pilot Altitude (ft)	Copilot Altitude (ft)	Min. Altitude (ft)	Max Altitude (ft)
1	0.000	0	0	0			-30	21
2	0.150	99	0	0			-30	21
3	0.300	198	0	0			-30	21
4	0.450	297	0	-51			-82	-30
5	0.400	149	29,000	28980			28950	29001
6	0.500	188	29,000	28938			28907	28959
7	0.600	228	29,000	28871			28840	28892
8	0.650	248	29,000	28815			28785	28836
9	0.700	268	29,000	28756			28726	28777
10	0.400	130	35,000	34981			34951	35003
11	0.500	164	35,000	34941			34911	34962
12	0.600	199	35,000	34878			34847	34899
13	0.650	217	35,000	34825			34795	34846
14	0.700	235	35,000	34769			34739	34790
15	0.400	113	41,000	40982			40952	41003
16	0.500	142	41,000	40942			40912	40963
17	0.600	173	41,000	40879			40849	40901
18	0.650	188	41,000	40827			40797	40848
19	0.700	204	41,000	40771			40741	40793

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

Table 3-2
ADDU and Pitot/Static System Functional Test Tolerances for the Cessna Model S550 Aircraft

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

3.6 RVSM Critical Region Definition/Inspection Requirements

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 an inspection.

Figure 4 defines the RVSM Critical Region which extends from Frame 134 to a line 2 inches aft of Frame 151, and from a line 10 inches above the skin overlay to a line 3 inches below the skin overlay.

A placard (P/N D-11-Y29-0344-(36 or -37)), as shown in Figure 5, with the following wording must be installed on the aircraft as shown in Figure 4.

See Star Aviation, Inc. Document
No. R34-0294 for RVSM requirements.

Prior to all flights in RVSM airspace, the operator (flight crew) must perform a general visual inspection of 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 static port orifices must also be inspected for corrosion, elongation, deformation, and/or obstruction and the operator (flight crew) must ensure that no foreign matter is found within the port orifice. If damage or surface irregularities are found, repair the damage in accordance with the maintenance manual and/or structural repair manual prior to operations in RVSM airspace. See Section 3.3.

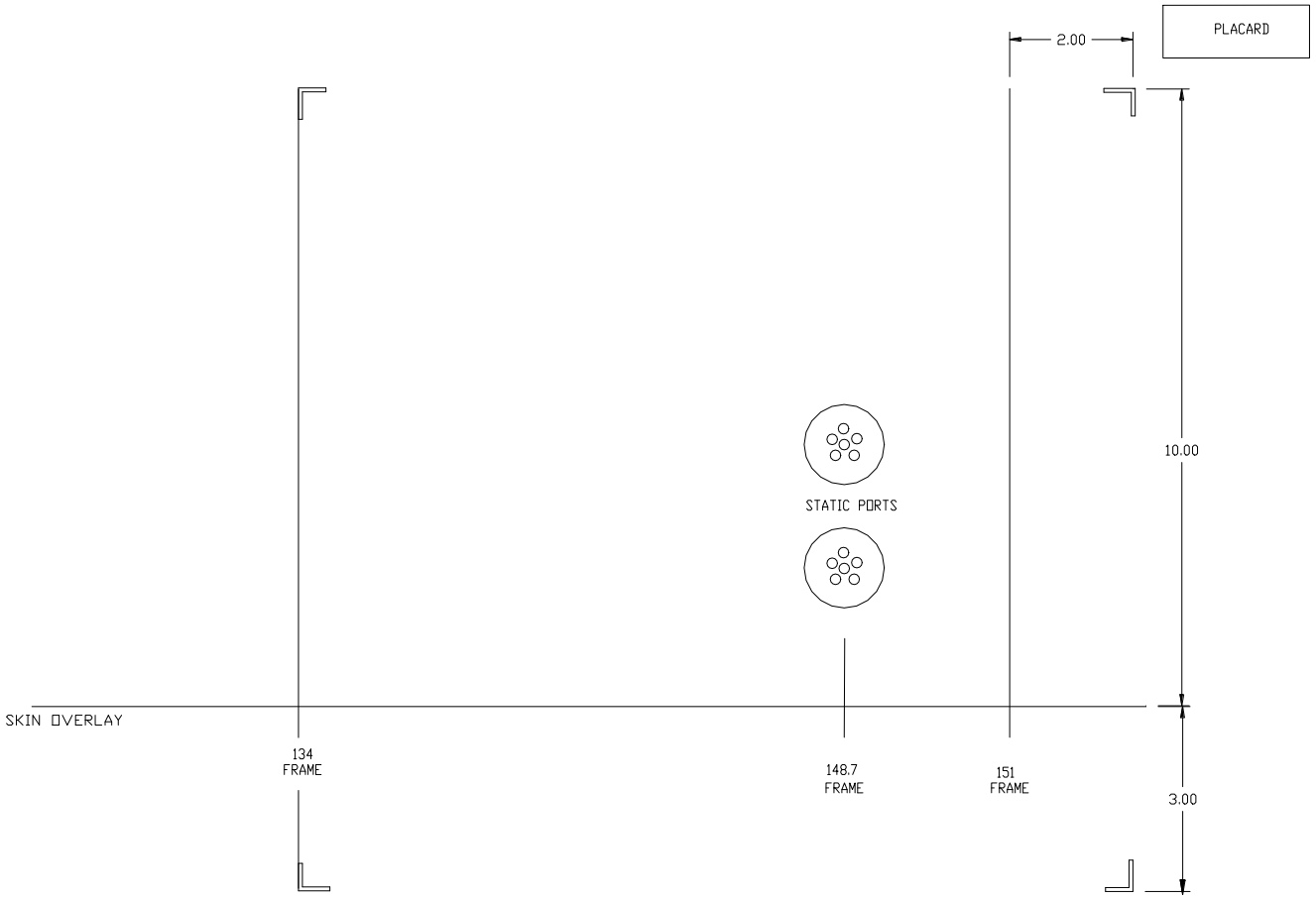


Figure 4 RVSM Critical Region Definition, Left Side Shown

See Star Aviation, Inc. Document No. R34-0294 for RVSM Requirements

Figure 5 RVSM Critical Region Placard (P/N D-11-Y29-0344-(-36 or –37))

3.7 Autopilot (Altitude Hold) Performance Test

RVSM operation requires that the autopilot system accurately maintains selected altitude during non-turbulent, non-gusty cruise flight. Perform required autopilot checks and/or maintenance in accordance with the component and airplane maintenance manuals. Also perform the following in-flight altitude hold performance test every 24 months.

Test Procedure

Equipment Required: None.

During normal RVSM cruise flight (at an altitude between FL290 and FL430, 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 at least 30 minutes in length. The maximum altitude deviation shown on the display should not exceed ±65 ft of the acquired altitude.

Airplane:				Date:		
Enroute To:				Pilot:		
Time (Minutes)	Pilot's Altimeter	Copilot's Altimeter	Pilot's Mach	Copilot's Mach	Pilot's KCAS	Copilot's KCAS
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						

Table 3-3
RVSM Autopilot Performance Check Table, Cessna Model S550 Cruise Conditions

3.8 Troubleshooting Information

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

3.8.1 Air Data System Troubleshooting

For Air Data System trouble shooting use wiring diagrams 34-10-01, Star Aviation Drawing D34-0723 **(D34-1094 if IADDU's are installed)**, along with Figures 6, 7 and 8 of this report and general aircraft troubleshooting practices.

If the Air Data System is found to exceed the requirements of Table 3-2, service the pitot/static system in accordance with the maintenance manual. Check and drain the pitot/static lines, conduct a leak check, and repeat the RVSM air data ground test in accordance with the procedures provided in Section 3.5 of this document. If the requirements of Table 3-2 are again exceeded, service the ADDU's per the manufacturer's service requirements. The serviced units must be re-tested upon re-installation in the airplane per the requirements of Section 3.5 of this document.

3.8.2 Analogue Interface Unit Troubleshooting

See Innovative Solutions & Support Manual 1D-81040-26; Operation and Installation Manual, Analog Interface Unit (AIU).

3.8.3 (Integrated) Air Data Display Unit Troubleshooting

See Innovative Solutions & Support Manual 1D-80130-16; Operation and Installation Manual, Air Data Display Unit (ADDU).

See Innovative Solutions & Support Manual 1D-80170-2; Operation and Installation Manual, Integrated Air Data Display Unit (IADDU).

3.8.4 RVSM Critical Region Inspection

If a visual inspection of the RVSM Critical Region, defined in Figure 4, indicates that damage, deformation, repairs, etc. exists that may impact air data system accuracy, then the operator should conduct inspection/repairs per the maintenance and/or structural repair Manuals. All repairs within the RVSM Critical Region must remain internal. If internal repairs are not possible, the inspection and tests presented in Section 3.3 must be conducted.

3.8.5 Autopilot (Altitude Hold) Check

If the autopilot cannot maintain altitude to within ±65 feet from the selected cruise altitude, repeat the autopilot check per Section 3.7 ensuring the Mach number remains constant and the air remains stable during the entire check. If the check still fails, conduct autopilot component and/or servicing checks as specified in the component and airplane maintenance manuals. Repeat the test presented in Section 3.7, as required, to ensure that the altitude hold accuracy is maintained.

3.9 AIU and ADDU Removal and Replacement Instructions

3.9.1 Analogue Interface Unit

Removal of the AIU is performed as follows:

1. Disconnect the two electrical D-sub connectors from the front of the AIU.
2. Loosen the AIU hold downs and slide the AIU from its mounting tray.
3. Protect the exposed AIU electrical connectors with protective caps.

Installation is the reverse of removal.

3.9.2 Air Data Display Unit

Removal of the ADDU is performed as follows:

1. Loosen the two screws securing the ADDU to the instrument mounting clamp.
2. Carefully pull the ADDU from the instrument panel until the electrical and pneumatic connections are accessible.
3. Disconnect the electrical and pneumatic connectors. Cap the exposed connections.

Installation is the reverse of removal.

Perform pitot/static leak checks any time the ADDU is removed/replaced.

3.10 Air Data System Operational Test

See Star Aviation report R34-0226, Operational Test for RVSM Air Data System on Cessna S550 Citation S/II, for performing an operational/functional check of the Star Aviation RVSM Air Data System.

3.11 AIU and ADDU Operational Tests

3.11.1 AIU

See Innovative Solutions & Support Manual 1D-81040-26; Operation and Installation Manual Analog Interface Unit (AIU), Section III, Part 3-1 Bit and Function Checkout, Part 3-2 Initiated Test Mode Checkout and Part 3-3 AIU Checkout Results.

3.11.2 ADDU / IADDU

See Innovative Solutions & Support Manual 1D-80130-16; Operation and Installation Manual, Air Data Display Unit (ADDU), Section III, Part 3-1 Bit and Functional Checkout and Part 3-2 Control Operation Checkout.

See Innovative Solutions & Support Manual 1D-80170-2; Operation and Installation Manual, Integrated Air Data Display Unit (IADDU), Section III, Part 3-1 Bit and Functional Checkout and Part 3-2 Control Operation Checkout.

Note: No special inspections or maintenance is required on the AIU or ADDU / IADDU. See Innovative Solutions & Support Manual 1D-81040-26; “Operation and Installation Manual, Analog Interface Unit (AIU)”, Section III, Part 3-1, Innovative Solutions & Support Manual 1D-80130-16; “Operation and Installation Manual, Air Data Display Unit (ADDU)”, Section III, Part 3-1, and Innovative Solutions & Support Manual 1D-80170-2; “Operation and Installation Manual, Integrated Air Data Display Unit (IADDU)”, Section III, Part 3-1 for details.

3.12 Replacement parts

For all parts added as part of this STC, Contact Star Aviation for all replacement parts at
2150 Michigan Avenue, Brookley Complex, Mobile, AL 36615; Ph. (251) 650-0600 or Fax (251) 650-0602.

4 AIRWORTHINESS LIMITATIONS

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

Threshold Inspection NTH	Maintenance Interval NRI	Airworthiness Limitation
		WIRING AND GROUND STUD INSPECTION
		Remove Nose Equipment Cover in order to access avionics compartment.
Scheduled Annual Inspection	Scheduled Annual Inspection	General visual inspection of the wiring and ground studs installed per Star Aviation drawing D-34-Y29-0343 for chafing, corrosion, loose connections and proper security – See Figures 6, 7 and 8. Any discrepancies shall refer to drawing D-34-Y29-0343 Ships Wiring Routing and Clipping for restoring components to the intent of drawing D-34-Y29-0343, or contact Star Aviation at (251) 650-0600 for additional instructions.
		PITOT/STATIC SYSTEM INSPECTION
Scheduled Annual Inspection	Scheduled Annual Inspection	No new inspections required above and beyond aircraft's existing maintenance program. – See Figures 9 and 10. Any discrepancies shall refer to drawing D-34-Y29-0346 Pitot and Static System Modification for restoring components to the intent of drawing D-34-Y29-0346.
		STRUCTURAL INSPECTION
Scheduled Annual Inspection	Scheduled Annual Inspection	A detailed visual inspection of the D-25-Y29-0341-101 Bracket Assy located between STA 43 and 52 at LBL 10 and 15 for cracks, corrosion, missing or loose fasteners – See Figures 6 and 11. A detailed visual inspection of the D-25-Y29-0341-7 Angle located between STA 43 and 47 at LBL 6 for cracks, corrosion, missing or loose fasteners – See Figures 6 and 11. Any discrepancies shall refer to drawing D-34-Y29-0342 RVSM Equipment Installation for returning components to the intent of drawing D-34-Y29-0342, or contact Star Aviation at (251) 650-0600 for additional information.

Threshold Inspection N_{TH}	Maintenance Interval NRI	Airworthiness Limitation
		INSTRUMENT PANEL INSPECTION
Scheduled Annual Inspection	Scheduled Annual Inspection	A general visual inspection of the D-25-Y29-0345-1, -2 or Design Deviation implemented Instrument Panel and instruments located at STA 102.5 for cracks, corrosion, missing or loose fasteners – See Figure 12. Any discrepancies shall refer to drawing D-34-Y29-0342 RVSM Equipment Installation or contact Star Aviation for restoring components to the intent of drawing D-34-Y29-0342.
		CIRCUIT BREAKER PANEL INSPECTION
Scheduled Annual Inspection	Scheduled Annual Inspection	A close visual inspection of the D-25-Y29-0347-101 Circuit Breaker Panel located between STA 137 and 141 at RBL 20 for cracks, corrosion, missing or loose fasteners – See Figures 6 and 13. Any discrepancies shall refer to drawing D-34-Y29-0342 RVSM Equipment Installation or contact Star Aviation for restoring components to the intent of drawing D-34-Y29-0342.

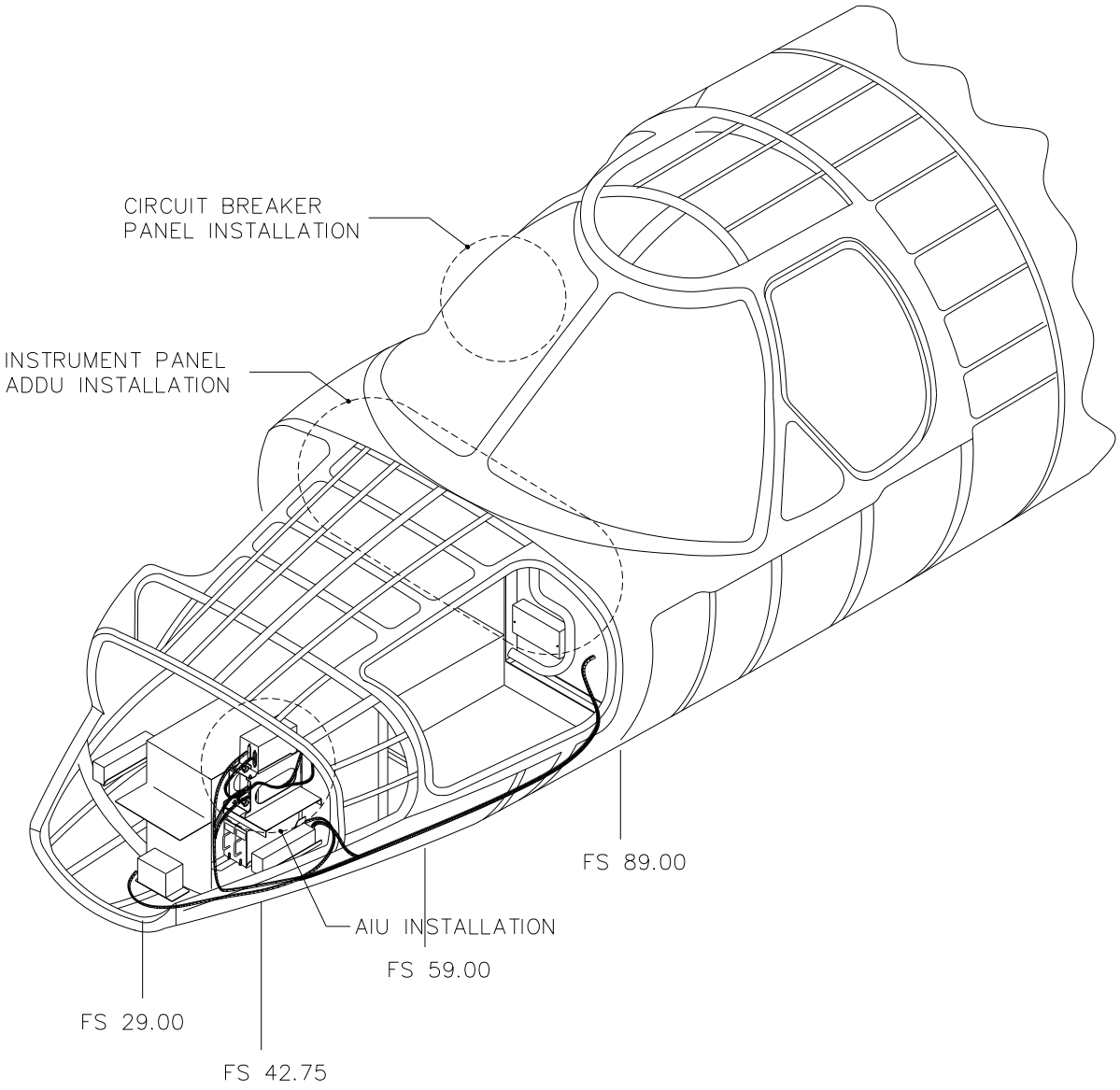


Figure 6: Air Data System Installation

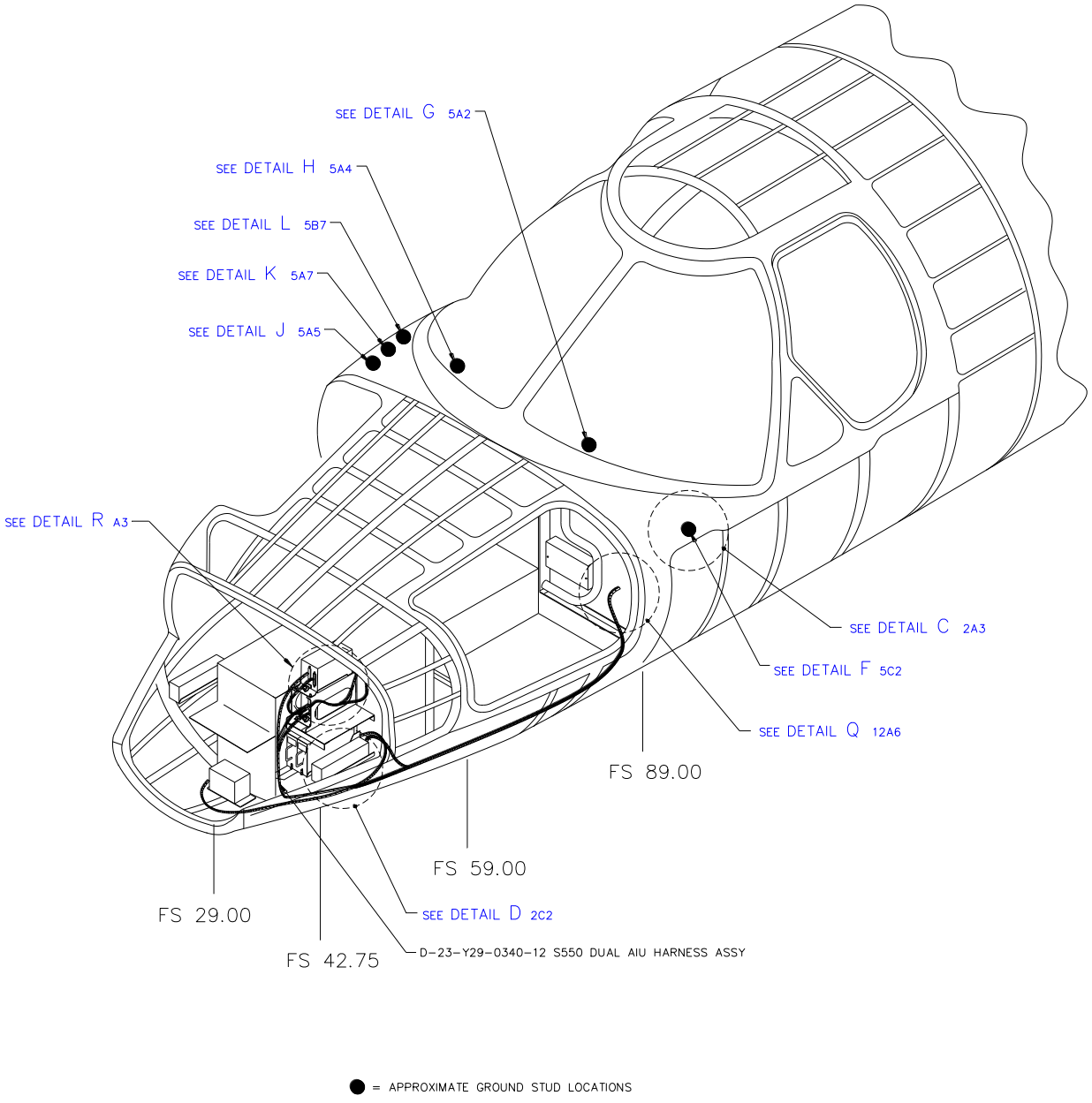


Figure 7: Ground Stud Locations

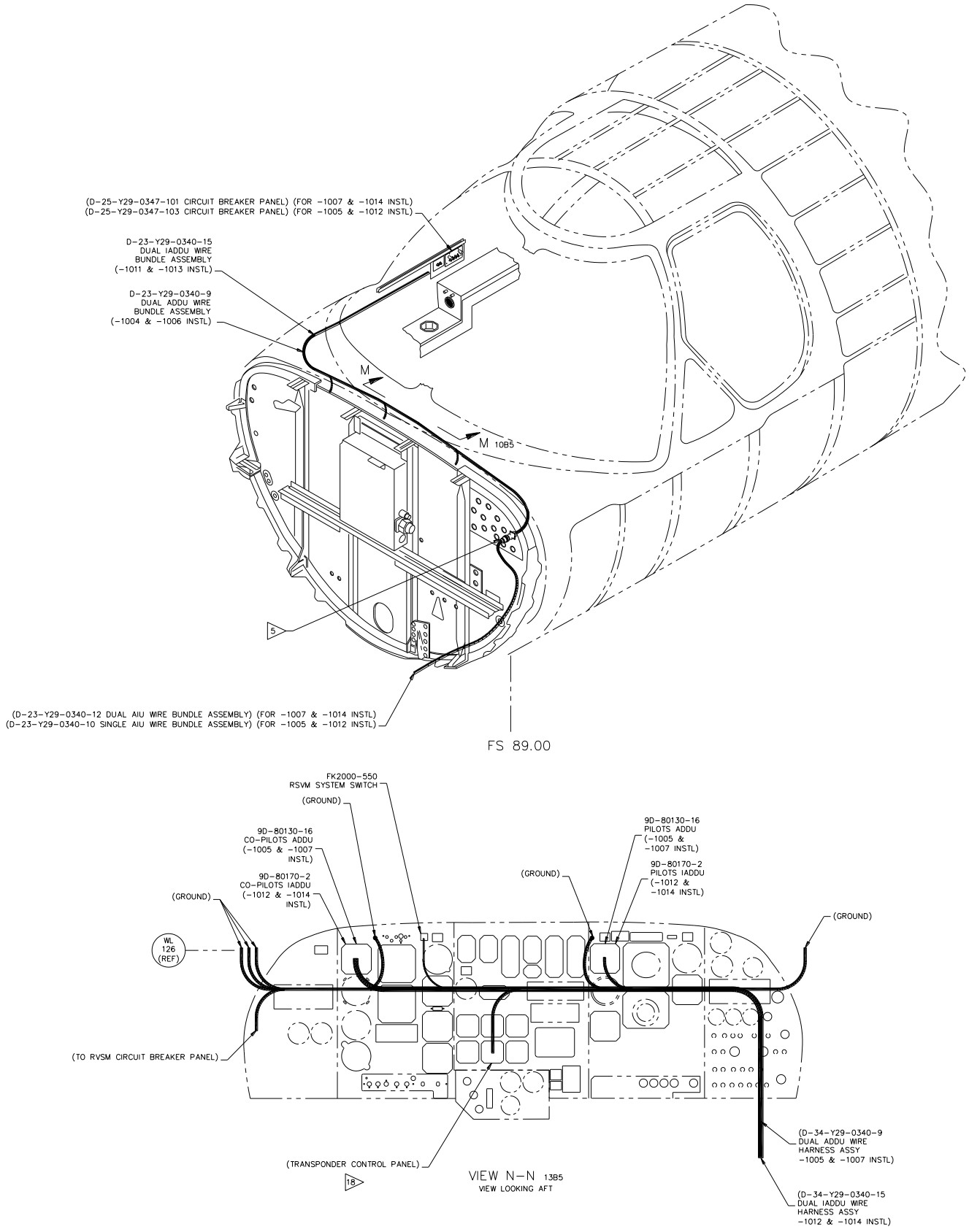
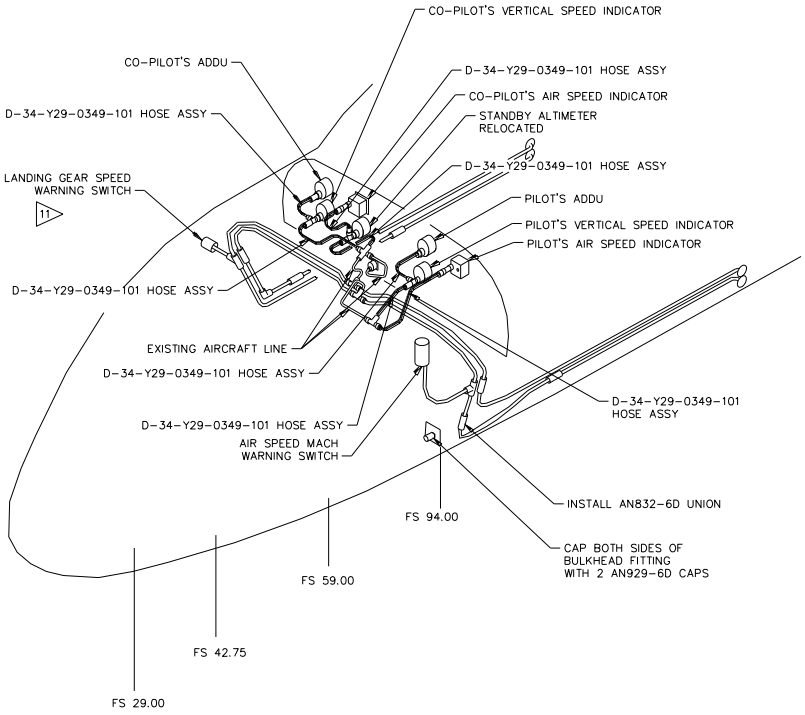
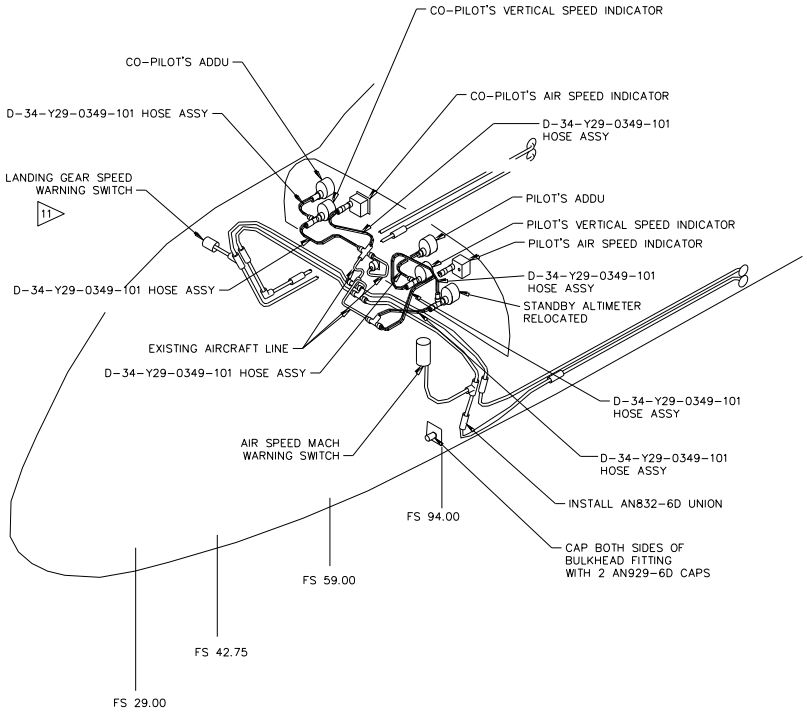


Figure 8: Instrument Panel Wiring Installation



RVSM STATIC SYSTEM
(STBY ALT ON PILOTS SIDE)



RVSM STATIC SYSTEM
(STBY ALT ON COPILOTS SIDE)

Figure 9: RVSM Static System

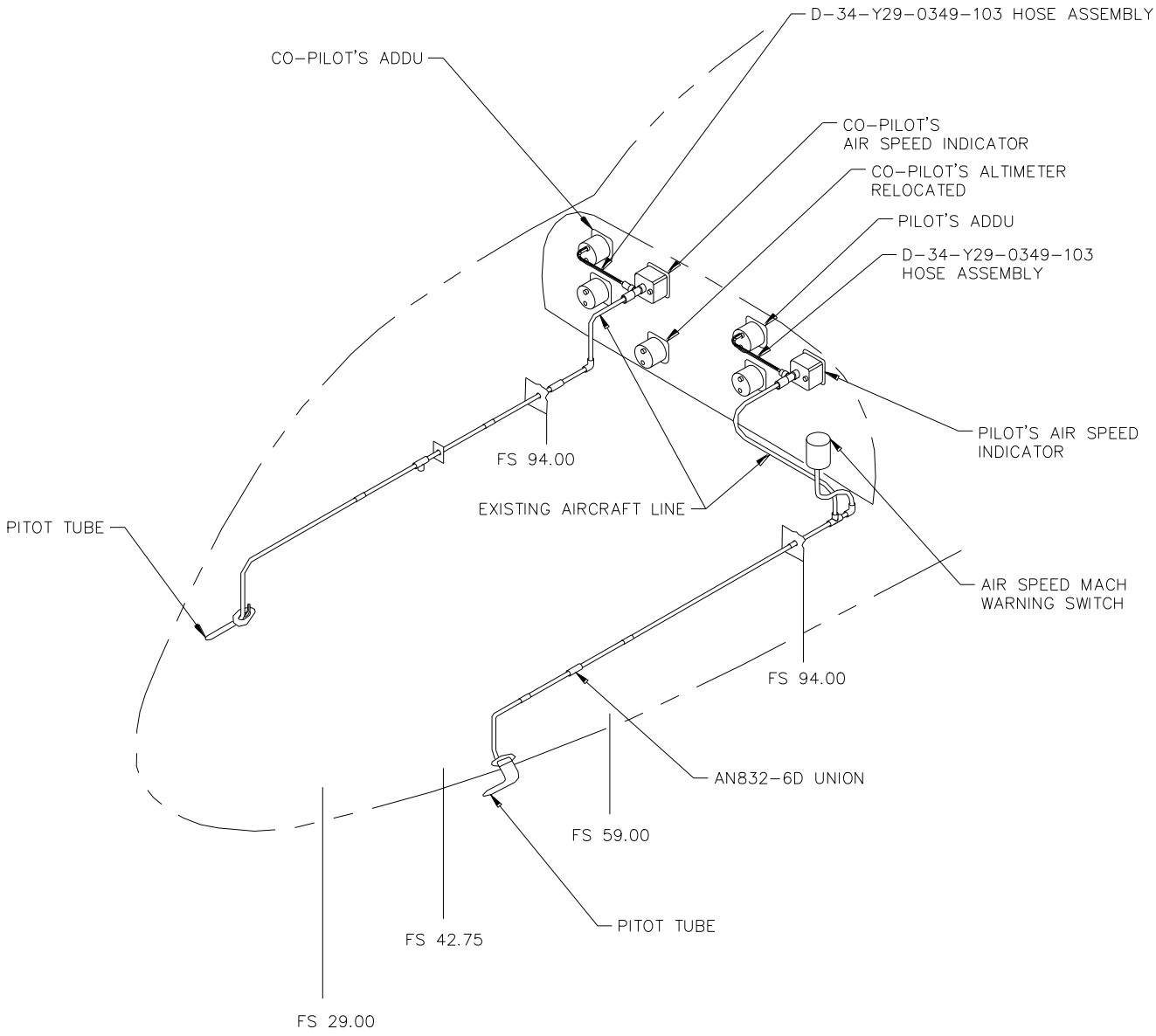


Figure 10: RVSM Pitot System

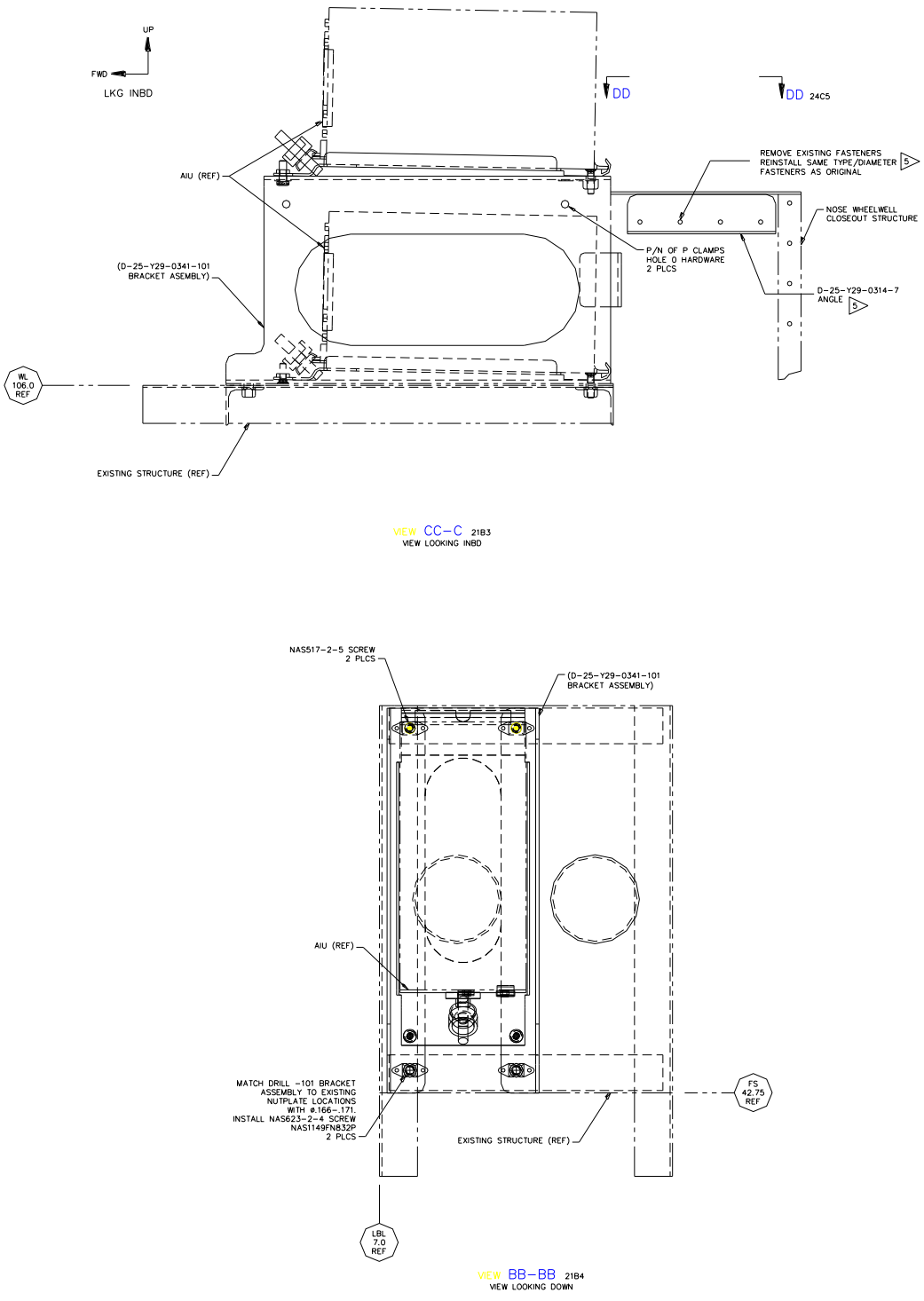


Figure 11: AIU Mounting Bracket Installation

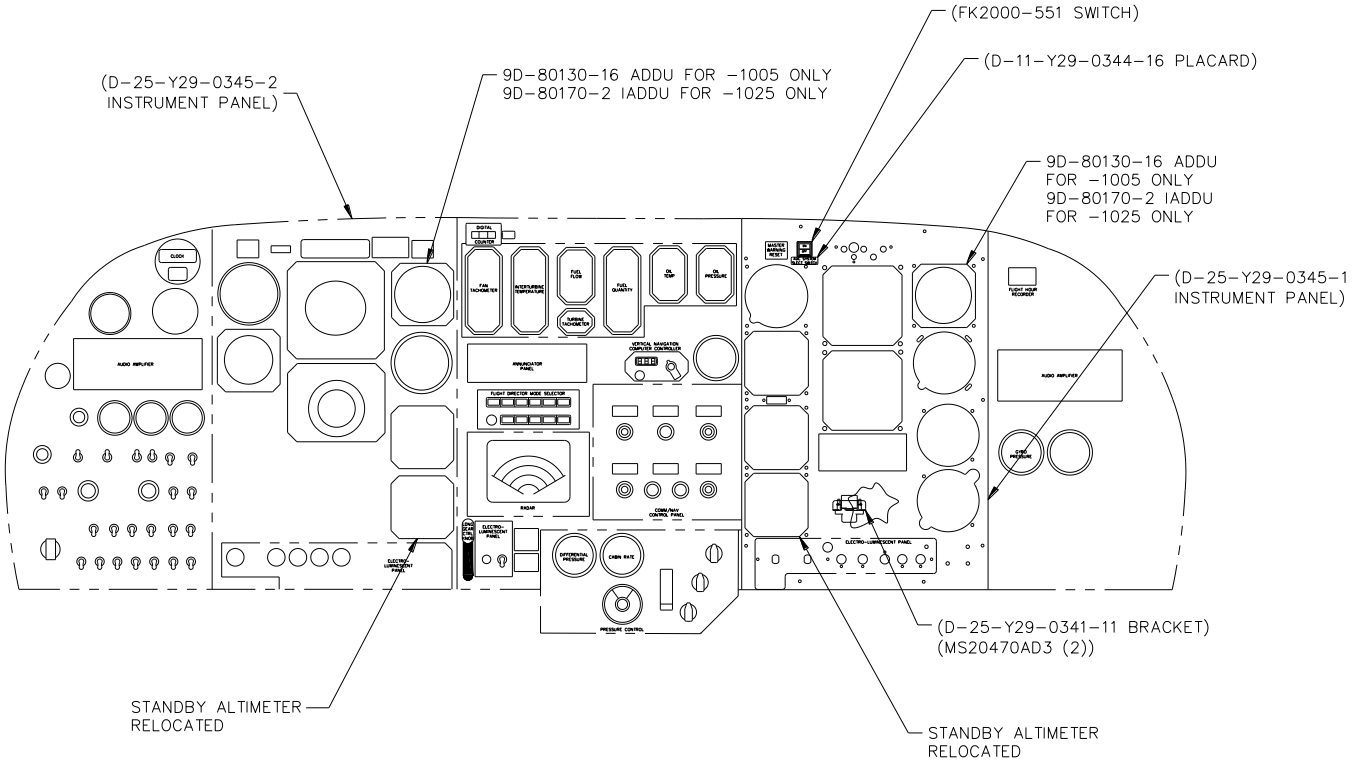


Figure 12: Instrument Panel Layout

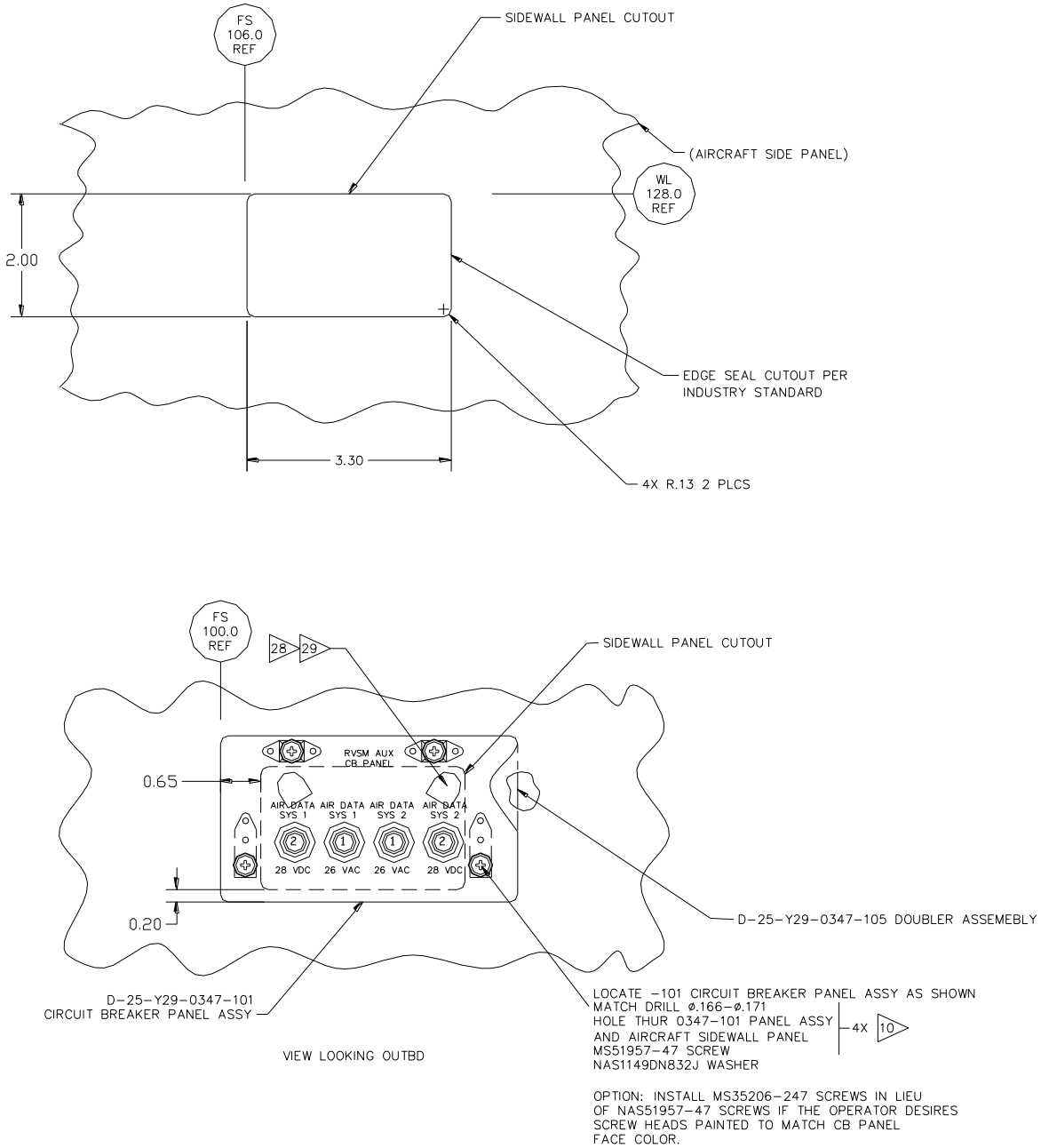


Figure 13: Circuit Breaker Panel Installation

5 SUMMARY OF OPERATIONAL REQUIREMENTS

To ensure compliance with RVSM altimetry system accuracy and integrity requirements during RVSM operations, the Cessna S550 Citation S/II aircraft must incorporate the required operational conditions and special flight crew training into the appropriate documents and programs.

5.1 Detection of a 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. Pilot should also note airspeed and Mach number.

In addition to the hourly (required) cross-cockpit checks during RVSM operations, an additional check will be made between the primary altimeters and the standby altimeter. The differences between the altitude displayed on each of the primary altimeters and the standby altimeter should remain constant at a constant Mach number. Some small variation can be expected, but both primary altitude indicator displays should not diverge significantly throughout RVSM cruise flight, relative to the standby altimeter display at a constant Mach number. In all cases, the two primary altimeters must agree to within +/-200 feet, otherwise, ATC must be notified and contingency procedures executed. Table 5-1 may be used to record these altitude comparison data.

Date:				Pilot:		
Departing From:				Copilot:		
Destination:						
Time (Interval)	Time (GMT)	Pilot Mach	Pilot Alt	Copilot Mach	Copilot Alt	Standby Alt
Initial RVSM Altitude						
+1 hour						
+2 hours						
+3 hours						
+4 hours						
+5 hours						
+6 hours						

Table 5-1
Altimeter Display Tracking Form

5.2 Flight Crew Training

All flight crews must have knowledge and understanding of standard RVSM operating practices and Air Traffic Control contingencies. In addition, all flight crews must have knowledge and understanding of the information contained in this document. The operations manual should be revised to include these RVSM-specific limitations and/or procedures, if necessary.

The Flight Crew should be familiar with the specific operational guidelines and contingency procedures that may be unique from one region of RVSM airspace to another (i.e. North Atlantic, European, Pacific, West Atlantic Route System, etc.).