

RVSM MAINTENANCE

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RVSM MAINTENANCE



RVSM MAINTENANCE

USING THIS MANUAL

Persons using this manual must have previously been trained specifically on RVSM maintenance issues. This manual ties together our own practices and policies and how we apply previous training, current regulations, and the use of other external reference documents.

COMPANY NAME REFERENCES

Our company name is Alpha Flying Service, LLC.. Throughout our manuals we have shortened this to “*Alpha Flying Service*” and in some places to the acceptable reference of the “*Company.*”

COMPANY PERSONNEL REFERENCES

RVSM Liaison: This manual has references to the duties associated with the RVSM Liaison, a generic term used to identify a duty position in a company that has liaison responsibilities for the RVSM maintenance and/or operations.

Maintenance Management Title: We refer to the Director of Maintenance as the primary focal point for maintenance operations issues as they relate to this manual. This person may also hold the RVSM Liaison position.

NOTE: If, due to the limited size of our company or a changing of personnel, we do not have person that physically holds the position of Director of Maintenance then those references in this program become descriptive of a *function*, rather than a specific person and the listed duties and responsibilities in this manual become the responsibility of the Director of Operations.

Operations Management Title: We refer to the Director of Operations as the primary focal point for flight operations issues as they relate to this manual. This person may also hold the RVSM Liaison position.

MAINTENANCE MANAGEMENT RESPONSIBILITY

The Director of Maintenance is responsible for ensuring compliance with the RVSM maintenance program.

Alpha Flying Service may use contract maintenance, such as a local FBO or repair station, to oversee some or all of the day-to-day maintenance

activities on the aircraft. The Director of Maintenance is the single point of contact for RVSM maintenance issues and has responsibility for compliance with Alpha Flying Service's RVSM Program.

CHAPTER STRUCTURES

TRAINING AND FORMS CHAPTERS

The training and forms chapters deal with RVSM-related forms and training that may be recommended for mechanics.

AIRCRAFT-SPECIFIC SECTION

This manual covers the accepted policies and practices used in RVSM maintenance.

This manual has one or more *Aircraft-Specific* chapters for aircraft we have RVSM approval so that it covers anything that is specific to an aircraft, mostly in regards maintenance, MELs, inspections, etc. These chapters start at "Aircraft-A" "Aircraft-B", etc.

OTHER MANUALS, REFERENCE MATERIAL, AND DOCUMENTS

There are other references, publications, and manuals used by Alpha Flying Service personnel in the conduct of RVSM flight or maintenance operations. These items are identified in the Non-Regulatory Section of this manual (if applicable) or in their appropriate chapter when the information is required for approval/acceptance.

Should any references in this manual be contrary to any officially published documentation, then we shall defer to the officially published documentation. If any Company person becomes aware of any material that seems outdated or incorrectly referencing a regulatory requirement then bring it to the attention of the Director of Maintenance.

COMPANY INFORMATION

COMPANY CONTACT INFORMATION

Alpha Flying Service, LLC.
12345 Airport Dr. Suite 300
Las Vegas, NV 89129
USA

Telephone: 702-123-4567

Fax: 702-765-4321

REGULATORY APPROVAL

REGULATORY OFFICE

Our authorization to conduct RVSM maintenance and flight operations, and any other authorization for Special Use Airspace, is granted by:

FAA Flight Standards

District Office (Las Vegas FSDO)

7181 Amigo St. Suite 180
Las Vegas, NV 89119

Telephone: 702-269-1445

Fax: 702-269-8013

ACCESS TO RECORDS

Our records of maintenance and training related to our authorizations are always made available. Any routine request for records should be immediately passed to our listed managers.

In the interest of air safety and regulatory compliance, our records shall be made immediately available to any of our government inspectors, even on the ramp or in the shop without delay.

DISTRIBUTION AND ACCESS TO THE RVSM MAINTENANCE PROGRAM MANUAL

This manual is our master document for RVSM maintenance issues related to our aircraft.

A copy (print or electronic) of this manual shall be carried in the aircraft, along with the appropriate authorization documents, any time the aircraft is operated into RVSM or Special Use Airspace.

A copy of this manual is maintained by the Alpha Flying Service flight and/or maintenance department.

A copy of this manual shall be made available to any person or organization performing maintenance on the aircraft to ensure that they understand the issues surrounding RVSM maintenance and the references to the supporting documents. This requirement can be met by allowing them access to the aircraft's copy or an electronic on Internet posted copy of the manual.

AUTHORIZATIONS FOR RVSM

OPERATIONS THAT MAY BE ISSUED

Authority to conduct flight in airspace where RVSM is applied is issued in operations specifications (OpsSpecs), a Letter of Authorization (LOA), or management specifications issued under 14 CFR part 91, Subpart K, as appropriate. To issue an RVSM authorization, the Las Vegas FSDO must find that our identified aircraft have been approved in accordance with 14 CFR part 91, Appendix G.

The RVSM authorization is issued by the home country governing aviation authority and authorizes flight into RVSM airspace anywhere in the world, so long as other operational and compliance requirements (such as compliance with ICAO or individual country rules) are met. The RVSM authorization is based on the aircraft having met certain maintenance requirements and the crewmembers/operator having met the basic qualifications in 14 CFR part 91, Appendix G, for knowledge and ability to operate in RVSM airspace.

OUR RVSM AUTHORIZATION

For our Part 91 operations the Las Vegas FSDO issues a Letter of Authorization (LOA) for our RVSM operations and related *Special Use Airspace*. The LOA must be carried in the aircraft at all times we are operating under the specified authority.

RVSM AUTHORIZATION EFFECTIVITY AND RENEWALS

The RVSM authorizations are issued without an expiration date and are valid so long as we, the operator, meets the requirements or limitations listed in our RVSM documents. Depending on changing regulatory requirements, the FAA may insist upon changes to the manuals and still keep the authorizations in place while changes are being made.

AIRSPACE AUTHORIZATIONS

In conjunction with RVSM authorizations, the Las Vegas FSDO issues airspace authorizations that are a combination of the aircraft meeting certain equipment requirements, such as for RVSM, RNP-/-5/-10, P-RNAV and to operate in MNPS airspace, and the operator authorizations for flights in that airspace that is determined by having meet certain operational requirements for operations policies and procedures and pilot training and currency requirements.

Both the aircraft qualification, as shown in the Aircraft-Specific chapter document for each aircraft, and the operational approvals are required.

CONSULTING ASSISTANCE

THE RVSM COMPANY, LLC. (TRC)

Some or all of the compliance manuals have been developed by The RVSM Company (TRC) to be used for RVSM, MEL(s) and other certifications. They will assist with operational and compliance advice, but the final determination of the suitability of any manual or submission is the sole responsibility of Alpha Flying Service.

For assistance with updating or changing our manuals, contact TRC:

THE RVSM COMPANY, LLC. (TRC)

9448 Vista Ridge Ave

Las Vegas, NV 89129

Tele: 303-719-RVSM (7876)

Email: justin.naekel@thervsmcompany.com

Website: www.thervsmcompany.com

TRC is located in the Mountain Time zone. GMT -8.

FAA OFFICE

The Las Vegas FSDO has a requirement that we make direct contact with them in all matters relating to the issuing of any RVSM authorizations. It is important that we have a direct working relationship with the Las Vegas FSDO and with any inspectors that handle our authorizations or oversee our activities.

MANUAL CONSTRUCTION

USE OF SHOULD, SHALL, MAY AND WILL

SHOULD – This term is used when it is the will of Alpha Flying Service that an action or event *should* occur, but it is not mandatory. Unless there is a compelling reason for non-compliance, the word *Should* would be interchangeable with the word *Shall*.

SHALL – This is a present tense version of the future, *Will*. Compliance with statements that use *Shall* is mandatory. If you cannot comply, other than in an emergency, then you may not take the action or event that is referenced. For example, you *shall* not depart on a flight that does not meet the minimum fuel or weather requirements.

MAY – This term is used when compliance with part of the manual is within the discretion of the person making the decision, such as the Pilot-in-Command. For example, you *may* decide to cancel a departure based on your discretion as the Pilot-in-Command.

WILL – This is the future tense version of the word *shall*. For example, you *will* provide access to the cockpit for aviation inspectors.

Your inability to comply with a portion of Alpha Flying Service manuals *shall* be reported to the Director of Maintenance. A determination *shall* be made of the situation and further guidance, training, instruction or changes to Alpha Flying Service manuals may result.

Gender References: This manual is gender neutral and any references or comments to he, she, him, his or her all have the same meaning.

Personnel Reference

Maintenance Technician/Mechanic: Reference to a person that is performing maintenance on the aircraft.

Captain/PIC: The terms Captain and PIC [Pilot-in-Command] are interchangeable in this manual and refers to the pilot assigned responsibility and authority for the flight.

Pilot: Reference to a pilot refers generically to a pilot that may be operating the aircraft, working with manuals or charts or handling communications.

MANUAL REVISIONS

MANUAL REVISION RECORD

The Director of Maintenance is responsible for reviewing the manual on a continuous basis. Changes are issued on an “as required basis” because of an internal request, government-specified request, or by changing conditions.

The Director of Maintenance handles the revisions to this manual. Manual revisions are submitted to the Las Vegas FSDO for their review and acceptance. Once revisions are accepted or approved, they are posted into the appropriate RVSM manual. See the *Consulting Assistance* paragraph for guidance on help with changing the manuals and coordinating them with the Las Vegas FSDO.

COORDINATING CHANGES WITH THE LAS VEGAS FSDO

1. Determine and identify what requirements have prompted the need for a change.
2. Identify the source material cited in the change, if applicable.
3. Review the RVSM manuals and identify what the changes will be and their potential impact on other areas of the manuals and perhaps our overall flight or maintenance operations.
4. Make the changes, update the document and the table of contents, and make a set of prints for review.
5. Change the revision number of the entire document and adjust the page numbers in the tables of contents.
6. Review the printed changes and determine if they meet the new requirements and are not contrary to any other governing body guidance.
7. Make a cover letter to the Las Vegas FSDO that outlines why the changes are being made. Include an updated copy of the table(s) of contents and ask for approval. Send two copies for approval so they can sign one and send back the other.
8. If the Las Vegas FSDO does not approve the initial changes then review their comments and see what needs to be done to meet the new requirement, or call them and discuss the change issues to be sure you have a clear idea of what is being changed or rejected and what must be done to reach approval.
9. When the Las Vegas FSDO approves the document changes insert them into the appropriate manuals.
10. Notify the Director of Maintenance and the pilots of the changes and decide if additional training is required to accommodate the new changes.

MANUAL REVISION RECORD

The Director of Maintenance is responsible for reviewing the manual on a continuous basis. Changes are initiated on an *"as required basis"* such as an internal request, government-specified request, or by changing conditions.

REVISION AMENDMENTS

1. When a revision occurs, a revision number is assigned to the revised chapter as a whole and listed on the "Maintenance Control Page" page.
2. The revision date and number of each page is changed in the chapter footer to have the same revision date before the chapter is reprinted in its entirety.
3. Multiple changes can be included within the chapter revision. If there are significant changes to the chapter, a narrative of the changes will accompany the revision to alert the manual holder.
4. A bar can be placed on this paragraph to show how a change is indicated. The bar may be placed on either side of the margin depending on the page setup.

PAST PERFORMANCE

Alpha Flying Service does not have a history of poor height keeping performance, which does not indicate a potential weakness in training, procedures, maintenance, or in the operation of the aircraft.

RVSM MAINTENANCE

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PROGRAM GENERAL MAINTENANCE ISSUES - NOT AIRCRAFT SPECIFIC

RVSM AUTHORIZATION

NOTE: Several of the following paragraphs deal with the details of determining that an aircraft is RVSM compliant and how this relates to our company policies and procedures to ensure that there is coordination of information between the mechanics, pilots, and flight and maintenance management functions so that no aircraft is dispatched into RVSM airspace that is not RVSM compliant for that flight.

AIRCRAFT READY FOR RVSM FLIGHT

The Director of Operations is responsible for the operational aspects and pilot compliance of this program and the operating manuals for RVSM and other SOA issues.

The Director of Operations notifies the pilots of any changes in procedures in the RVSM program and is responsible for the flight compliance portions of this program. He/she notifies the maintenance personnel of any changes in procedures of the RVSM program.

The Director of Maintenance is responsible for ensuring that the RVSM status of the aircraft is correctly reflected in any flight documents, such as flight or maintenance logs, MEL deferrals, etc. This currency of RVSM status must be kept coordinated with flight personnel at all times—both showing an aircraft as being non-RVSM compliant and for an okay to return to RVSM operations.

The path of ensuring compliance is linked to the following:

1. The flight and maintenance logs that the Director of Maintenance has determined to show an RVSM status of GO or NO GO for RVSM, which may or may not affect other aspects of a decision to fly.
2. The Director of Operations ensures by monitoring flight activities that any issues regarding a NO GO status of an RVSM aircraft is considered for each flight and that the flight crew is alerted to the status and their planning and dispatch ability is considered.

PREFLIGHT ACTIONS

The following actions are accomplished during preflight:

3. Determine that the aircraft is authorized for RVSM operations by checking that a copy of the RVSM authorization is in the aircraft that lists the aircraft by make, model, and serial number as being authorized for RVSM operations.
4. Review the maintenance entries and forms to ascertain the condition of equipment required for flight in the RVSM airspace. Ensure that maintenance actions have been taken to correct defects to required equipment.
 - a. Our company policies on handling maintenance discrepancies is that they be cleared or properly deferred per the MEL before a flight may begin. Do not begin a flight with any open discrepancies that have not been cleared or corrected or deferred per the MEL.
 - b. The aircraft logs indicate if the aircraft is eligible or not for RVSM operations on this particular day. Various open discrepancies may make the aircraft ineligible for RVSM flight (for example because of an MEL item), but is still eligible for other flights. Check the discrepancies and crosscheck with the MEL to be sure how any discrepancy may affect your flight status and RVSM status.
5. The RVSM maintenance program directs the Director of Maintenance to notify the pilots of any changes in the RVSM status of an aircraft and to advise if an RVSM non-compliant aircraft is otherwise operational for flights, even if limited in capabilities.

Form 30-100, RVSM Maintenance Status, is used to show the status of any non-compliant aircraft and what components are inoperative or malfunctioning or outside of RVSM-acceptable tolerances. If there were RVSM maintenance write-ups then they should show on Form 30-105, RVSM Open Discrepancy Log.

6. A decision to fly an RVSM non-compliant aircraft, probably at a lower flight level, may require additional flight planning to take into account increased fuel burn and possible diversions due to weather and winds.

It would not be acceptable to depart on a flight and then rely on an assumption of being able to request ATC to allow you to fly into RVSM airspace as a non-compliant aircraft.

7. RVSM Critical Area: During the external inspection of aircraft, particular attention shall be paid to the condition of static sources and the condition of the fuselage skin in the vicinity of each static source and any other component that affects altimetry system accuracy (this check may be accomplished by a qualified and authorized person other than the pilot, such as maintenance personnel).

This is a skin and equipment (probes, vents, static) condition check which is required for RVSM operations in determining that the areas are free of defects and that they do not show any indication of having been damaged or any waviness to the skin areas.

8. For RVSM operations, more attention is directed to weather issues for high-altitude flight, including warnings about mountain wave activity (MWA) and possible severe turbulence. With reduced vertical separation, the issues of turbulence can create a hazard of being off altitude and in conflict with other air traffic.
9. Before takeoff, the equipment required for flight in RVSM airspace shall be operational, and indications of malfunction shall be resolved. The MEL will show the specific list of ATA items/equipment required for flight in RVSM airspace.

MEL STATUS

The MEL has to be carefully reviewed for any open discrepancies and it is determined that none of the open items will make the aircraft ineligible for RVSM flights. If a mechanic is in doubt about the applicability of any given MEL item and its impact on RVSM operations they shall consult with the Director of Maintenance for guidance.

Special attention must be paid to any deferred items in the:

- a. ATA 22 – Auto Flight,
- b. ATA 23 – Communications, and
- c. ATA 34 – Navigation areas.

A deferred discrepancy may be MEL legal for most flights, but would not allow the aircraft into any of the special interest airspace covered in this manual. An example might be an autopilot that could be inoperative for non-RVSM operations but must be functional for flights into RVSM airspace.

MEL SPECIFIC ITEMS

The individual RVSM chapter for each aircraft has reference to RVSM maintenance documents for the aircraft and has MEL specific items that are derived from the MMEL and MEL that are potentially required for some special airspace operations. Review the list carefully for applicability to each flight.

MINIMUM REQUIREMENTS

To operate this aircraft in RVSM airspace the following is required and must be confirmed in compliance before a flight in RVSM airspace.

EQUIPMENT

The aircraft must be equipped with the following items that are fully functional:

- a. Two independent height measuring systems, generally the aircraft altimeters,
- b. An automatic altitude control system,
- c. An altitude alerter, and
- d. One SSR altitude reporting transponder. If only one is installed, it must be selectable to either air data computer. This is not required in the case of operations in the North Atlantic and Pacific RVSM non-radar controlled airspace.

AIRCRAFT SPECIFIC MAINTENANCE REQUIREMENTS

Maintenance requirements that are specific to individual aircraft are detailed in the *Aircraft-Specific* chapters of this manual.

Know that while there are standard RVSM maintenance procedures for each aircraft, even of the same make and model, some aircraft may have been made RVSM compliant in *different* ways—i.e., by SB compliance, or different STCs on the same series of aircraft.

It is important that the mechanics that work on the aircraft pay attention to differences in the *Aircraft-Specific* chapter for a given aircraft.

RVSM MAINTENANCE REQUIREMENTS

Alpha Flying Service complies with the following standard practices to ensure that our RVSM-approved aircraft continue to meet the RVSM standards:

1. The Director of Maintenance is responsible for compliance with all requirements of the RVSM maintenance program.
2. RVSM equipment is maintained in accordance with manufacturer's maintenance manuals.
3. Any maintenance or modifications, which alter in any way the original RVSM approval, is subject to a design review by the manufacturer and/or the Las Vegas FSDO.
4. Any maintenance practices, which may affect the continuing RVSM approval integrity, e.g. the alignment of pitot-static tubes, dents, or deformation around static ports, shall be referred to the Las Vegas FSDO or to persons delegated by the Las Vegas FSDO.
5. Built-In Test Equipment (BITE) testing is not an acceptable basis for system calibrations (unless it is shown to be acceptable by the manufacturer with the Las Vegas FSDO's agreement) and should only be used for fault isolation and troubleshooting purposes.
6. Some aircraft manufacturers have determined that the removal and replacement of components using quick disconnects and associated fittings when properly connected will not require a leak check. While this approach may allow the aircraft to meet static system certification standards when properly connected, it does not always ensure the integrity of fittings and connectors nor does it confirm system integrity during component replacement connections.
7. Therefore, a leak check should be accomplished anytime a quick disconnect static line is broken.
8. Airframe and static systems shall be maintained in accordance with the airframe manufacturer's maintenance manual.
9. Checks of skin waviness in the area of the static probes shall be accomplished following any painting, repairs, or alterations, which may affect the surface airflow in these areas.

Changes to this RVSM maintenance program will be approved by the FAA before incorporation into this manual.

INSPECTION PROGRAMS

Each aircraft may have a different inspection program, even if the same make and model depending on the desires of the owners or operator. Because of this, it is important that the Director of Maintenance carefully review the inspection program line item listings to ensure that the RVSM issues are always cited and addressed.

FACTORY RVSM COMPLIANT AIRCRAFT

Most of these aircraft will have the RVSM related items part of the factory list of inspection items and not require any special consideration other than following the inspection list in a timely and compliant manner.

OTHER AIRCRAFT

Aircraft that are RVSM-compliant either by compliance with a SB or STC usually have to have the inspection program modified to ensure that the RVSM items, usually items incorporated in the Instructions for Continuous Airworthiness (ICAs) are followed and performed in a timely and compliant manner.

ADDING A NEW AIRCRAFT

To add an aircraft we need to do the following:

1. Determine how the aircraft is RVSM compliant. This may be from the factory in some cases with compliance built into the factory inspection program or it may be by compliance with a specific service bulletin. In some cases the aircraft may be RVSM compliant based on an STC.
2. Determine what MEL equipment is applicable to RVSM and, if needed, for MNPS or special airspace requirements. Checking the MMEL against the aircraft equipment is the place to start and then cite the applicable in the table in the Aircraft-Specific document.
3. In the Aircraft-Specific document complete the list of installed equipment. Some of the equipment is strictly for RVSM compliance, while other items may be required for MNPS or other airspace authorizations.
4. Review the SB or factory inspection items to determine if the aircraft has been authorized for RVSM operations.
5. Collect a copy of the aircraft's paperwork and check for a maintenance entry if applicable, which shows compliance with either the SB or the

factory inspection item or an STC. This will determine how the aircraft will be made compliant.

RVSM AIRCRAFT-SPECIFIC CHAPTER

1. Create a new Aircraft-Specific chapter supplement and add chapter for each aircraft. Some aircraft may be added to this manual, as a supplement section in the Aircraft-Specific chapter so that all other parts of the manual are the same. This is the preferred method for adding a new aircraft.
2. You may find some cases where the manufacturer has issued supplemental information about things to watch out for such as radomes or skin issues, etc. If there are supplemental issues then list them in the Aircraft-Specific supplement for that aircraft.

AUTHORIZATIONS FOR FLIGHTS IN OTHER SPECIAL USE AIRSPACE

RNP-4/-10: You must review the aircraft's equipment list, by manufacturer, make and model, and with the assistance of the Las Vegas FSDO as needed, determine if the installed navigation equipment meets the requirements to be approved for RNP-4 and -10 authorizations.

MNPS: Aircraft operating in MNPS airspace require the same review and regulatory approval for navigation *and* communications equipment.

RNP-1/P-RNAV: Review the documentation of installed equipment, along with current regulatory guidance, including ACs, that specify additional requirements to be listed for the Aircraft-Specific chapter for any given aircraft. This specific airspace authorization requires more extensive documentation of equipment on the navigation accuracy and error feedback than do the others. Additionally, we must have an operating policies and procedures document specific not only to RNP-1/P-RNAV, but specific to each aircraft as certain maintenance and operational practices, specifically in regards the database are often aircraft-specific.

OTHER CHAPTERS OF THIS MANUAL REVIEWED OR CHANGED

1. This is the time to review the other chapters of this manual to determine if they need to be updated with current information, either about our Company or to align with new or changed procedures or regulatory requirements.
2. If we change the other chapters then submit the changed chapters, along with an updated Control Pages chapter and give an explanation

of what was changed and why and if need be, any references that would make it easier for the reviewers to determine that we are in compliance by making new changes.

MEL CRITICAL ITEMS

1. Go through the maintenance documents and with the aircraft's MMEL and MEL determine what the MEL critical items are for operations in the special use airspace.
2. In the aircraft's Aircraft-Specific document list the items that have been identified as being RVSM critical.

REGULATORY APPROVAL

1. Submit the RVSM Program Manual with the new Aircraft-Specific chapter supplement that is specific to the aircraft. The chapter has:
 - a. The RVSM equipment form
 - b. A copy of the aircraft's RVSM compliant status, such as a copy of the SB, inspection item, STC, with a copy of a maintenance log or work order entry,
 - c. Any modified checklists or changes to the AFM that was required or requested,
 - d. A reference to the aircraft's MEL.
2. A letter requesting to review the documentation for addition of this aircraft and an issuance of a new authorization.
3. The FAA will stamp and approve the Page Control/List of Effective Pages of these manual changes.

PARTS CONTROL

1. Prior to replacing any RVSM related component(s), the technician performing the work will check the listing in the manufacturer's approved RVSM Service Bulletin or inspection document to determine if the unit being replaced is one of the RVSM qualifying components. Replacement Parts are available from the manufacturer and their authorized service centers.
2. RVSM components are tested to RVSM tolerance after completion of repairs by the approved repair facility before being returned to service. If the technician performing the work determines that the unit being

replaced is an RVSM qualifying component, he/she will ensure that the component being installed has the correct part number for RVSM operations.

3. Components are checked for shipping damage, corrosion, or other deterioration. Rejected parts shall be returned to the source of supply.
4. The physical part number is crosschecked against the part number as specified in the IPC. In addition, the airworthiness approval documentation (8130-3) and/or a certification of a certificate of conformity that the components comply with current regulations are verified prior to installation.
5. Part number changes of RVSM equipment must first be approved. After part number changes are approved, Alpha Flying Service must submit a revision to this program for review by the FAA. If the revision is approved, the new part number(s) will be eligible for installation.
6. Service Bulletins and modifications to RVSM components must be approved by the manufacturer and the regulatory agency.

Should it become necessary to replace an RVSM qualifying component with a non-RVSM qualifying component (assuming that such a replacement is otherwise permitted), the technician performing the work shall placard the aircraft to prevent RVSM operations. He/she will annotate the aircraft's log with an open pilot information discrepancy on the *RVSM Open Discrepancy Log* form (30-105) and inform operations that the aircraft is not RVSM qualified.

SPECIAL TEST AND INSPECTION REQUIREMENTS

AIR DATA TEST SETS

Alpha Flying Service may utilize outside maintenance support facilities for troubleshooting air data computer systems on an "as needed" basis. The calibration procedures for the air data test sets used by all of these facilities can be traced to NIST (National Institute of Standards and Technology) standards, or equivalent country standard. Any testing of the air data computer system on any of its RVSM qualified aircraft be accomplished only by authorized maintenance facilities that met the standards outlined in the manufacturer's approved RVSM Service Bulletin or other controlling document.

MECHANIC TRAINING

See the *Maintenance Training* chapter.

OUTSOURCE MAINTENANCE

In the event that outsource maintenance is required, the flight crew will contact the Director of Maintenance who will make arrangements for outsource maintenance.

The Director of Maintenance will determine, prior to maintenance being performed, that the maintenance facility and personnel capabilities are acceptable, and meet the requirements of the Alpha Flying Service RVSM maintenance program.

Any time that an outside maintenance vendor is tasked to perform work on any RVSM related repair, they are to be audited for technician training and adequate tooling and equipment. The Alpha Flying Service Director of Maintenance or appointed RVSM Liaison will complete the *RVSM Audit Form*, prior to commencing work. A record of each audit is maintained by the Director of Maintenance or appointed RVSM Liaison. Copies are furnished to each aircraft to avoid duplication of audits. The *RVSM Audit Form*, 30-110, has blocks on the bottom of the front side of the form showing where that particular copy is going.

ENSURING COMPLIANCE

This is difficult to do with any facility other than our primary maintenance and support vendor. If using a factory-authorized service center we can more easily check records. However, if repairs are to be made on the road, such as changing an autopilot, then the Director of Maintenance must be directly involved to ensure that the persons working on the system have training that is satisfactory to him and that we have provided the applicable maintenance documents, such as, but not limited to the AMM, an STC or SB, if applicable, or our inspection records.

Each instance of work done away from our main base shall be re-inspected for adequate documentation and insurances that the correct equipment, forms, and references were used.

REPAIR STATIONS AND FACTORY AUTHORIZED SERVICE CENTERS

Repair stations (foreign and domestic) have regulatory oversight and auditing beyond what we might be able to audit ourselves, especially if we have limited maintenance management in the company. If using an a repair

station we must determine that the facility is indeed a repair station with authorization for RVSM work on our specific equipment. If not, then the work may be performed under the authority of the individual mechanics so long as we then provide complete documentation of the RVSM maintenance and inspection requirements and we have determined that they have the tools and technical equipment required by the maintenance guidance.

If in doubt, contact the Las Vegas FSDO for the most current guidance on use of outsourced maintenance.

REPORTING PROCEDURES

1. In the event that a gross height-keeping error occurs during RVSM operations, the Pilot-In-Command will notify the Director of Maintenance via fax utilizing the *Altitude Deviation Report* who will then follow up the report to the Las Vegas FSDO with an initial analysis of causal factors and measures to prevent further events. In no case will the total elapsed time from the time of occurrence to the time of notification exceed seventy-two (72) hours.
2. When reporting a height-keeping error or other malfunction that involves RVSM required equipment while being operated in RVSM airspace, the *RVSM Status Report* header and Section A must be completed and forwarded by fax as required on the bottom of the form to the Director of Maintenance and the Las Vegas FSDO. The aircraft is now considered to be non-RVSM compliant until returned to RVSM service by authorized personnel.
3. When necessary repairs have been made to RVSM related equipment and the equipment is again mechanically compliant, complete Section B of the *RVSM Status Report* (Form 30-100) and forward by fax as required on the bottom of the form. The aircraft may be considered and returned to RVSM compliant status only after the *RVSM Status Report* has been properly forwarded. Keep the completed *RVSM Status Report* along with the fax verification with the aircraft flight logbook for proof of compliance.
4. This report must be made at any time that an RVSM related malfunction occurs while operating in RVSM airspace. If non-RVSM operations are being conducted, the discrepancy shall be made on the *RVSM Open Discrepancy Log* if the aircraft is otherwise legal for flight. If RVSM operations are planned, the aircraft may not be utilized for RVSM service until proper repairs have been made and cleared from the

RVSM Open Discrepancy Log. The discrepancy remains in the aircraft logs until properly returned to RVSM compliance.

NOTE: Discrepancies involving RVSM related equipment that result in a height-keeping error while being operated in RVSM airspace must be submitted within 72 hours of discovery. The aircraft is then considered to be RVSM NON-COMPLIANT until properly returned to service.

NON-COMPLIANT AIRCRAFT

- a. The aircraft have been previously qualified and approved for flight in RVSM operation and is considered to be non-compliant for RVSM operations and shall not be operated in RVSM airspace if the RVSM height keeping capability of the aircraft is negatively affected due to component or system malfunction(s).
- b. Any non-compliant aircraft must be reported to the Director of Operations and the status to fly other than in RVSM airspace must be made available to the pilots. It is possible that the aircraft, while non-compliant for RVSM operations, say due to an autopilot issue, could be fully operational for other non-RVSM flights.
- c. It is essential that the coordination between maintenance and flight operations be constantly monitored and evaluated to be sure that information about the current RVSM status of an aircraft is conveyed to and understood by the pilots and mechanics alike.

CONDITIONS FOR REMOVAL OF RVSM AUTHORIZATION

STRUCTURAL DAMAGE AND REPAIRS

Structural damage and repairs that may affect the integrity of the pitot static system or the *RVSM Critical Region* require detailed evaluation for RVSM Continued Airworthiness.

A skin mapping and area integrity inspection may also be required if a radome or panel is replaced in or near the RVSM critical region.

PAINTING

If the aircraft skin or structure in the RVSM critical region is painted, particular attention must be given to the RVSM critical region inspection and

skin mapping criteria that is contained in the approved RVSM maintenance documentation for the aircraft.

GROUND

1. Differences Between Primary Altimeters

The aircraft altimeters should be set to the local altimeter (QNH) setting and should display a known elevation (e.g., field elevation) within the limits specified in aircraft operating manuals. The difference between the known elevation and the elevation displayed on the altimeters should not exceed 75 feet. The two primary altimeters should also agree within limits specified by the AFM.

2. Exceedance

The air data system is tested, repaired and inspected in accordance with RVSM service bulletin or ASC as appropriate and this maintenance program.

FLIGHT

1. Differences Between Primary Altimeters

- a. Total Vertical Error (TVE) exceeds ± 300 feet
- b. Altimetry System Error (ASE) exceeds ± 245 feet
- c. Assigned Altitude Deviation (AAD) exceeds ± 300 feet
- d. Difference between pilot and copilot altimeters in level flight at RVSM cruise altitudes exceeds ± 200 feet.

2. Exceedance

The air data system is tested, repaired and inspected in accordance with RVSM service bulletin or ASC as appropriate and this maintenance program.

3. A height monitoring test was failed, either during a scheduled test or from the results of an automated fly over test.

REINSTATEMENT OF RVSM AUTHORIZATION**RETURNING AN AIRCRAFT TO SERVICE**

1. Confirm problem and determine cause (examples):
 - a. MADC(s) or DADCs
 - b. Altimeters
 - c. Static Systems
 - d. Damage to Radome or Pitot/Static Probes
 - e. Transponder(s)
 - f. Automatic Altitude Control System(s)
 - g. Altitude Alert System
2. Accomplish Repairs
3. Perform maintenance manual operational checks and inspections pertinent to the repair for the items repaired.
4. A RVSM validation flight may be required if significant structural repairs have been accomplished that affect the integrity of the pitot-static system, the RVSM critical area skin waviness, and/or pitot probe alignment.
5. Consult the RVSM Instructions for Initial and Continued Airworthiness (ICA or IICA), the airplane Structural Repair Manual (SRM), the Airframe Manufacturer, and/or the RVSM STC holder (if applicable), as required for guidance.
6. Clear all open RVSM maintenance entries in the aircraft's maintenance log (AML), the RVSM Status Report Form (30-100), and the RVSM Open Discrepancy Log Form (30-105), as required.
7. If a MEL deferred item placard has been installed, clear the open MEL entries and remove the placard.
8. Notify the Director of Operations that the aircraft has been returned to service according to currently accepted or approved Alpha Flying Service maintenance discrepancy procedures and is eligible for RVSM operations.

RVSM HEIGHT MONITORING RECORDS

The Director of Maintenance maintains RVSM Height Monitoring records on aircraft approved for RVSM operations. Height Monitoring results are transferable with a change of aircraft ownership.

RVSM HEIGHT MONITORING AND VERIFICATION REQUIREMENTS

It is our responsibility to make arrangements to have a RVSM height monitoring flight accomplished. This flight may be accomplished prior to issuance of the RVSM authorization, within 6-months following the issuance of a RVSM authorization or within 6-months of beginning RVSM operations, whichever occurs later. This applies only to *group approved aircraft*. The Director of Maintenance knows which aircraft are group approved.

- a. The height monitoring must be conducted at least each 24-months or 1000 flight hours – whichever is longer.
- b. If an aircraft fails a height monitoring test, or we are notified from an automatic fly over test that the aircraft failed, the aircraft is non-RVSM compliant and a report must be made to the FAA per instructions in this manual.

RVSM HEIGHT MONITORING METHODS

The Director of Maintenance may elect to use either HMU or GMU height monitoring to meet the height monitoring requirements.

1. USA Domestic Height Monitoring Unit. (HMU)
 - a. There is several USA domestic ground-based height monitoring sites that we may use.
 - b. The actual procedures to use to coordinate the overflight and the means to check the results of such are subject to change. Go to the North American Approvals Registry and Monitoring Organization at:
http://www.tc.faa.gov/act-500/naab/rvsm/AGHME_main.asp

The site has most current information on ground-based height monitoring and all of the contact information for follow-ups.

2. Outside USA Ground Based Height Monitoring
 - a. The Stumble HMU Status Line provides operational information at 44 0 20 7832 6031. Gander HMU status can be verified by contacting the Gander HMU status line at 1+709 651 5301. Operators planning to overfly an HMU should file via STU or YQX.

Dispatchers should ensure flight plans include both aircraft registration and “HMU FLT STU” or “HMU FLT YQX” in the remarks section.

- b. HMU Monitoring results can be requested from the NAT Central Monitoring Agency (CMA) via fax at 44 0 20 7832 5562. The operator should include the appropriate Mode S or Mode A codes and estimated time of overflight when submitting a request for monitoring results.

- c. Unsuccessful results:

The Director of Maintenance is responsible for determining the appropriate action to be taken to correct the problem.

3. GPS Monitoring Unit (GMU)

- a. The FAA Technical Center is responsible for all monitoring activity and the operation of the GMU. CSSI Inc. and ARINC serve as GMU support contractors and assist the FAA Technical Center with the monitoring program. Alpha Flying Service Director of Maintenance will contact either CSSI INC. or the ARINC RVSM Program Office to arrange for a GMU monitored flight.

- b. After completion of the monitoring flight, the GPS data is processed by the GMU Contractor and forwarded to the FAA Technical Center. The operator will be advised by fax of the processing status of the data file. For the computation of the ASE, Meteorological data and Mode C data is collected and merged with the GPS data at the FAA Technical Center. Final ASE results should be available from the FAA Technical Center within three weeks of the flight. The results are sent to the State Civil Aviation Authority (CAA).

- c. Unsuccessful Results:

Appropriate action will be taken to correct the problem.

FUNCTIONAL TEST FLIGHTS

The requirement to perform a functional test flight is determined by the Director of Maintenance with guidance derived from manufacturer bulletins, the AMM and current FAA recommended practices.

Generally, functional test flight is not required after working on an avionics item so long as the functional test procedures specified in the avionics manual shows that the equipment is functioning properly.

Skin Repair: If there is skin damage or repairs anywhere in the RVSM critical areas (see the AMM for specifics) it is likely that a functional test flight will have to be performed. Those practices are beyond the scope of this operational approval and will have to be determined by coordination between the manufacturer, the Las Vegas FSDO, and persons that have performed skin work in this area. A separate test plan will have to be developed to meet that requirement.

Other Functional Flight Tests: If RVSM-critical items have been replaced and a functional check flight is deemed necessary by the Director of Maintenance, a flight check plan will be coordinated with the flight crew. A functional test might be for a variety of reasons (reported altitude errors is one), the minimum should be considered:

1. Reason for the check (altitude errors, skin mapping, etc)
2. Minimum crew required
3. What equipment has been changed, modified or altered
4. Consideration of any impact on a flight profile (i.e., such as the autopilot being changed may have an impact on flight modes and handling)
5. Consideration for coordination with ATC. ATC may need to grant access to RVSM airspace for the purpose of testing to a non-compliant aircraft so that altitude errors can be determined.
6. If there is a requirement for a new altitude monitoring flight to update the official records
7. Any other safety considerations.
8. The expected results that would be visible and known to the pilots.
9. A maintenance discrepancy entry will be made before the flight, identifying this as a functional flight test requirement and it shall be signed off at the end of the flight and kept as a part of the permanent records. If the test is unsuccessful then additional maintenance entries may be required.
10. Only persons required to be on board the aircraft will be there. This may include someone from maintenance and/or operations.
11. A report to the FAA is required if this aircraft had already been identified as being RVSM non-compliant.

12. Update any other records related to the modification or changing of this equipment.

Lastly, if RVSM items, as identified in this document such as autopilots or other equipment, were listed herein for the RVSM approval and the changed equipment has a different model number, even if the same manufacturer, you will have to obtain a new RVSM authorization from the FAA. This would require changing the listing on the equipment page, updating the page control with a new revision and getting an FAA review. It would be helpful if this was preplanned with the FAA, such that we have submitted a new equipment listing and page control even while just preparing to change out equipment.

RVSM MAINTENANCE