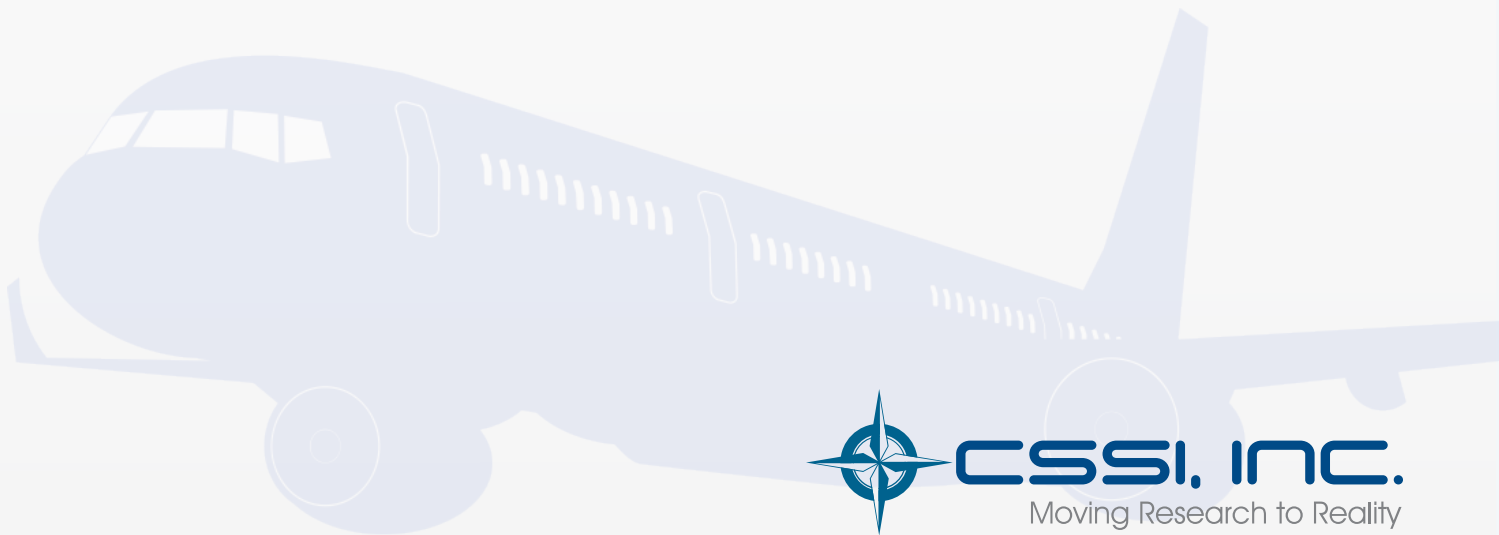


# RVSM 101

What It Is, How To  
Gain Approval, And  
How To Prepare For A  
Monitoring Flight



**CSSI, INC.**

Moving Research to Reality

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# Table of Contents

**What is RVSM?** ..... 1

**What is Required to Meet RVSM Approval?** ..... 1

**How Often do Aircraft Need to Be Monitored?** ..... 2

**Types of RVSM Monitoring Available** ..... 2

    AGHME Ground-Based Monitoring System ..... 2

    Portable Enhanced<sup>2</sup> GPS Monitoring Unit (E<sup>2</sup>GMU) ..... 3

**How CSSI Can Help** ..... 4

**Our Team of Experts** ..... 5

**Next Steps** ..... 6



We regularly field questions from customers about RVSM and what options are available for monitoring flights. We created this easy-to-understand guide to explain RVSM and its origins, how aircraft gain RVSM approval, and two options for obtaining RVSM approval.

## **What is RVSM?**

Reduced Vertical Separation Minimum (RVSM) is defined as the reduction of vertical space between aircraft from 2,000 to 1,000 feet at flight levels from 29,000 feet up to 41,000 feet. RVSM was implemented as a means to increase airspace capacity and access to more fuel-efficient flight levels. The International Civil Aviation Organization (ICAO) and its member states first mandated the implementation of RVSM in the North Atlantic in March 1997; with other regions around the world to follow. RVSM has now been implemented globally and requires that aircraft operating between flight levels 290 and 410 (inclusive) be RVSM approved.

## **What is Required to Meet RVSM Approval?**

Monitoring an aircraft to validate height-keeping performance is an important part of the RVSM approval process. Monitoring supports the safety assessment and safety oversight function that is required with RVSM implementation. As an operator, your aircraft must meet the minimum monitoring requirements established by your respective State authority to maintain RVSM approval status.

## How Often do Aircraft Need to Be Monitored?

In May 2011, ICAO member states implemented a long-term RVSM monitoring policy requiring that aircraft operating within RVSM airspace complete a re-occurring monitoring flight in order to maintain their RVSM approval status. Operators must complete a RVSM monitoring flight every two years (or 1,000 hours of flight, whichever is greater).

## Types of RVSM Monitoring Available

There are two options available to complete the requirements to receive or maintain RVSM approval; they are:

1. [The Federal Aviation Administration's \(FAA's\) ground-based system - AGHME \(Aircraft Geometric Height Measurement Element\)](#), or
2. [Portable Enhanced<sup>2</sup> GPS monitoring Unit \(E<sup>2</sup>GMU\)](#)

Let's examine these two options.

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## AGHME Ground-Based Monitoring System

### What is the AGHME?

The FAA's AGHME ground based monitoring system is comprised of several locations throughout the United States that collect data as aircraft fly over. These five US FAA ground-based monitoring systems are located in high air route traffic locations; Atlantic City, New Jersey; Cleveland, Ohio; Phoenix, Arizona; Wichita, Kansas and soon to be available in Portland, Oregon.



### How does an AGHME monitoring flight work?

To use the FAA's ground-based monitoring system (AGHME) option, your aircraft must be Mode S equipped. Prior to completing an overflight, the operator should check the status of the ground-based system (AGHME) the day of flight to ensure that the station is in operational status. This can be done by accessing [the FAA's NAARMO website](#).

When completing the overflight, the operator can better ensure a successful outcome by maintaining straight and level flight (no turns or altitude changes) while overflying the ground station. The aircraft must also be operating at an RVSM altitude (FL290-FL410 inclusive) in order for the data collected by the ground based system to be considered “usable” for altimetry system error (ASE) calculation by the FAA.

If the aircraft does not maintain straight and level flight the data may not be usable. The operator should refer to the FAA’s US RVSM Approval’s document to check the successful status of the AGHME overflight; this should be done approximately two-four weeks after completing the overflight. If the overflight was successful, the operator will find the date of flight logged in the AGHME flight column.

### **An Alternative to AGHME flights**

While the ground-based monitoring system (AGHME) is free, it may not prove to be the best monitoring option for all operators. It may not be convenient to fly over one of the five AGHME locations, the aircraft may not be mode-S equipped, and there is no way to confirm successful data collection until several weeks after the monitoring flight has been completed. While the five overflight locations capture a high volume of commercial aircraft traffic, smaller general aviation operators may opt for the location flexibility provided by the portable GPS monitoring unit (EGMU).

## **Portable Enhanced<sup>2</sup> GPS Monitoring Unit (E<sup>2</sup>GMU)**

### **What is an E<sup>2</sup>GMU?**

The E<sup>2</sup>GMU is a portable GPS monitoring device which consists of a monitoring unit assembly that contains the power supply, a GPS receiver and an altitude recording device (ARD), an Android tablet device that holds the data collection software and two portable GPS antenna which are temporarily mounted on the cabin windows of the aircraft. This equipment works together to collect all flight monitoring data required by the FAA to grant RVSM approval status.



The E<sup>2</sup>GMU provides a convenient and flexible option that can be completed during revenue, ferry, or special flights and performed worldwide.

## How does an E<sup>2</sup>GMU monitoring flight work?

As an operator, your first step would be to contact an approved RVSM monitoring contractor, such as CSSI to schedule your RVSM monitoring flight (a monitoring flight can typically be scheduled with as little as 24-48 hours' notice). The RVSM Manager will set up a monitoring flight to meet your schedule needs and a trained RVSM Monitoring Technician will meet your aircraft and flight crew at the scheduled location and within 15 minutes the monitoring equipment is set up and ready for the flight. The RVSM monitoring technician needs to collect approximately 30 minutes of data, straight and level flight, in RVSM airspace (FL290- 410 inclusive) to ensure a successful data collection.



When the monitoring flight is completed, the technician transmits both the E<sup>2</sup>GMU data file and flight information form (FIF) to the RVSM Team Members. Post-flight, the RVSM Team processes the collected data and sends the operator memo notification via email that the data files have been processed and sent to the FAA for final Altimetry System Error (ASE) calculation.

Once the FAA completes the ASE calculation, the RVSM Team will send the operator the “unofficial” results of their monitoring flight. CSSI has developed a process to keep the operator informed from beginning to end; our system is designed to help you, the operator.

## How CSSI Can Help

CSSI, Inc. leverages deep roots in aviation to develop customized solutions, including RVSM monitoring, that enhance productivity, decrease costs, and improve safety. CSSI has proudly served the RVSM monitoring needs for operators since July 1999, and has supported more than 8,000 monitoring flights worldwide. As an approved RVSM monitoring contractor, CSSI can conduct the RVSM monitoring flight required for an aircraft to maintain its RVSM approval status.



# Our Team of Experts

## Ross Burton

### **Senior Program Manager, International Programs**

Mr. Burton joined CSSI in January 1999 and has played a key role in the company's RVSM monitoring program since that time. Because of his many years of support to the RVSM program at CSSI and prior, Mr. Burton is considered a subject matter expert for both RVSM and flight standards/separation standards work in general. He frequently participates in international working group meetings and government technical exchanges dealing with RVSM.

## Carol Clarke

### **RVSM Project Manager**

Ms. Clarke provides overall project management support and subject matter expertise to the CSSI RVSM Monitoring Program. Prior to joining CSSI in 1999, she supported the implementation of RVSM in the North Atlantic Region, the first area in which RVSM was implemented.

## Robert (Bobby) L. Miller, III

### **RVSM Systems Analyst**

Mr. Miller joined CSSI in 2000 and has supported the RVSM monitoring program in several capacities since that time. He is considered the subject matter expert in RVSM data collection, providing technical expertise for both the software used for data collection as well as ensuring that the monitoring equipment is functioning to perform data collection. Mr. Miller also oversees the post-flight processing of the data collected during a RVSM monitoring flight, and performs a quality review and control of the data to ensure it meets the quality standards required for use in RVSM approval.

## Bobbie Williams

### **RVSM Analyst**

Ms. Williams is responsible for coordinating with the FAA to ensure they receive the daily and weekly updates to the monitoring schedule. She also provides support by performing post-flight processing of data collected during monitoring flights. Ms. Williams joined CSSI in 2004.

## Next Steps

CSSI stands ready to help with your RVSM needs, by providing services on an RVSM monitoring flight or answering your RVSM questions.

### Schedule an RVSM Monitoring Flight

Operators issued US RVSM authorization will be required to conduct a successful monitoring flight every two years or 1,000 hours of flight, whichever is greater. As an approved RVSM monitoring contractor, CSSI can conduct the RVSM monitoring flight required for an aircraft to maintain RVSM approval status. If you have questions on RVSM, please contact a CSSI RVSM team member at 1-866-468-8111.

To schedule your RVSM monitoring flight today, click the button below.

 [Schedule an RVSM Monitoring Flight](#)



## About CSSI

CSSI, Inc. partners with government and commercial clients to ensure transportation systems are designed and equipped to safely and efficiently move people and materials. Leveraging deep roots in aviation, CSSI, Inc. pioneers innovative analytics and best practices that improve reliability, maximize capacity and increase safety.

Founded in 1990, CSSI, Inc. employs nearly 300 professionals, has offices in five locations and supports clients throughout the United States and globally.

For more information on CSSI, Inc., please visit [www.cssiinc.com](http://www.cssiinc.com).



400 Virginia Ave, SW Suite 210  
Washington, D.C. 20024

+1 (202) 863-2175 phone

+1 (202) 863-7400 fax