

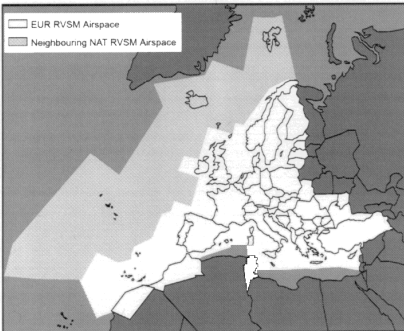


Implementation of Reduced Vertical Separation Minimum (RVSM) between FL 290 and FI 410 within European Airspace

GENERAL

Reduced Vertical Separation Minimum in the EUR RVSM Airspace will permit the application of a 1000 ft vertical separation minimum between suitably equipped aircraft in the level band FL290-FL410 (inclusive) on **24/01/02**.

The purpose of RVSM is to increase airspace capacity and provide airspace users with more flight levels and thus optimized flight profiles.



FIRs/UIRs where RVSM will be applicable in the EUR RVSM Airspace
 Amsterdam, Ankara, Athens, Barcelona, Belgrad, Berlin, Bodo, Bratislava, Bremen, Brindisi, Brussels, Bucharest, Budapest, Canaries (AFI Region), Casablanca, Chisinau, Dusseldorf, France, Frankfurt, Hannover, Istanbul, Kaliningrad, Copenhagen, Lisbon, Ljubljana, London, Lvov, Madrid, Malmo, Malta, Milan, Munich, Nicosia, Odessa, Oslo, Prague, Rhein, Riga, Rome, Rovaniemi, Sarajevo, Scottish, Shannon, Simferopol, Skopje, Sofia, Stavanger, Stockholm, Sundsvall, Switzerland, Tallinn, Tampere, Tirana, Trondheim, Tunis, Varna, Vilnius, Warsaw, Vienna, Zagreb.

RVSM CRUISING FLIGHT LEVELS

FL430*	
FL410	FL410
FL380	FL390
FL360	FL370
FL340	FL350
FL320	FL330
FL300	FL310
FL280*	FL290

* From RVSM level

APPROVAL FOR RVSM OPERATIONS

Only RVSM approved aircraft (*see State aircraft below*) will be permitted to operate within the EUR RVSM Airspace.

The approval is issued to aircraft operators by the responsible authority once an operator has achieved the following:

- each aircraft type has received airworthiness approval demonstrating compliance with the RVSM Minimum Aircraft System Performance Specification (MASPS);
- the State's approval of both the operations manual and the maintenance procedures specific to RVSM operations.

NON-RVSM APPROVED STATE AIRCRAFT

State aircraft are exempted from having to meet the RVSM MASPS. As a consequence, State aircraft can be accommodated in the EUR RVSM airspace provided that ATC maintains a minimum vertical separation of 2000 ft between such aircraft and all other IFR aircraft. In Field 18 of the ICAO FPL, State aircraft shall then request special handling by filling "STS/NONRVSM".

HEIGHT MONITORING PRINCIPLES

A comprehensive means of monitoring the height-keeping performance of aircraft in the EUR RVSM Airspace has been developed utilizing two types of monitoring equipment:

- Height Monitoring Units (HMUs) with a coverage of 45 NM - fixed ground based height-monitoring facilities at Linz (N48 12 E014 18), Nattenheim (N49 57 E006 28) & Geneva (N46 22 E005 56) which monitor passing aircraft normally without action from aircraft operators;
- GPS Monitoring Units (GMUs) - portable monitoring units carried on board aircraft to supplement HMUs & monitor aircraft which are not normally flying over HMUs.

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HEIGHT MONITORING PRINCIPLES

(continued)

RVSM compliant aircraft are required to participate in the monitoring program. In some cases, aircraft may request a re-routing so that they may be height monitored.

RVSM PROCEDURES IN TRANSITION AREAS

A number of FIR/UIRs in the EUR RVSM Airspace have been designated to handle the transition of aircraft from an RVSM to a non-RVSM environment and vice-versa. Within this "EUR RVSM Transition Airspace", special procedures will allow ATC to transition both RVSM and non-RVSM Civil and State aircraft. Flight crews may expect to change from Conventional Flight Levels to RVSM Flight Levels and vice-versa. ATC will continue to provide a 2,000 feet VSM between a non-RVSM approved aircraft and any other aircraft.

AIRCRAFT EQUIPMENT

The minimum equipment list (MEL) fulfilling the MASPS consists of: (see JAA TGL6)

1. Two independent altitude measurement systems each equipped with:
 - cross-coupled static/source system with ice protection if located in areas subject to ice accretion;
 - display of the computed pressure altitude to the flight crew;
 - digital encoding of the displayed altitude;
 - signals referenced to a pilot selected altitude for automatic altitude control and alerting;
 - Static source error correction.
2. One SSR transponder with an altitude reporting system in use for altitude keeping.
3. An altitude alerting system.
4. An automatic altitude control system.

ACAS

TCAS Version 6.04A is designed for a non-RVSM environment. ACAS II (TCAS Version 7.0) has improved compatibility with RVSM. The Mandatory Carriage and Operation of ACAS II for aircraft above 15000 kgs and more than 30 passengers started on 1 January 2000 with a transition period ending in March 2001.

FLIGHT PLANNING

The flight crew shall pay particular attention to conditions that may affect operation in RVSM airspace:

- verifying that the aircraft is RVSM approved, ie compliant with the MEL;
- analysing the reported and forecast weather that may affect RVSM requirements (turbulence, icing ...);
- reviewing the manufacturer's and the operator's restrictions concerning RVSM operations;
- ICAO-
 - FPL: the letter "W" shall be inserted in Field 10 if RVSM approved;
- RPL: the letter "W" shall be inserted in Item EQPT/ if RVSM approved, regardless of the requested FL.

NOTE:

Before 24 JAN 2002, insertion of "W" in item 10 of the flight plan does **NOT** imply that in European airspace an RVSM FL is plannable or that an RVSM FL can be requested by the pilot, unless this is explicitly promulgated by a State for operation in the airspace of the State.

PRE-FLIGHT PROCEDURES

Flight crews shall verify:

- the condition of the equipment required for RVSM operations and that maintenance actions have been taken to correct defects;
- the condition of static sources;
- the altimetry accuracy by setting the QNH or the QFE. The reading should then agree with the altitude of the apron or the zero height indication within a 75 ft (23m) tolerance.

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IN-FLIGHT PROCEDURES

- all the required equipment shall be monitored to ensure satisfactory operation before and within RVSM airspace;
- when changing levels, the aircraft should not overshoot or under-shoot the cleared flight level by more than 150 ft (45 m);
- the automatic altitude control system shall be engaged during level cruise by reference to one of the two altimeters. If fitted, the altitude capture feature shall be used whenever possible for the level off;
- cross checks of the primary altimeters shall be made at intervals of approximately one hour. These primary altimeters shall agree within 200 ft (60 m).

Failure to meet that condition will require the altimetry system to be reported as defective and immediately notified to ATC. An initial check shall be recorded just before entering the EUR RVSM Airspace.

CONTINGENCY PROCEDURES

- the pilot shall notify ATC of any contingency (equipment failure, weather hazards such as severe turbulence etc...) which affect the ability to maintain the cleared level or the RVSM requirements (e.g. MEL);
- ATC may take appropriate tactical actions to ensure that safe separation is maintained, including reversion to a 2000 ft separation minimum;
- when notified by ATC of an assigned altitude deviation of more than 300 ft (90 m), the pilot shall take action to return to the cleared level as quickly as possible.

If unable to notify ATC, the pilot shall follow established contingency procedures and obtain ATC clearance asap.

CIRCUMSTANCE	PHRASEOLOGY
ATC wish to know RVSM status of flight	CONFIRM RVSM APPROVED
Pilot indication that flight is RVSM approved	AFFIRM RVSM
Pilot indication that flight is NON RVSM approved	NEGATIVE RVSM
Pilot of State aircraft indicating that flight is NON RVSM approved	NEGATIVE RVSM STATE AIRCRAFT
ATC denial of clearance into RVSM Airspace	UNABLE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN [or DESCENT TO, or CLIMB TO] FL ...
Pilot reporting severe turbulence /weather affecting ability to maintain RVSM height-keeping requirements	UNABLE RVSM DUE TURBULENCE
Pilot reporting equipment degraded below RVSM requirements	UNABLE RVSM DUE EQUIPMENT
ATC requesting pilot to report when unable to resume RVSM	REPORT ABLE TO RESUME RVSM
Pilot ready to resume RVSM after equipment/weather contingency	READY TO RESUME RVSM

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