



Enroute Controller Training Materials

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Author: IVAO-HK ATC Operation Department

Correctly transfers aircraft to the next ATC unit

Transfer of Frequency

The general rule with frequency transfers is that they should occur before the aircraft enters the next controller's airspace. This may be laterally, as the aircraft approaches the edge of the TMA or vertically, as the aircraft climbs towards the upper limit of the TMA.

Suggested Hand-Off and Transfer Techniques between TMA & CTR

Note: hand-off refers to the action whereby the datatag is offered to the next controller for acceptance.

Transfer is the frequency transfer instruction issued to the aircraft.

Aim to hand off the datatag and transfer the aircraft no later than two minutes prior to the aircraft reaching the lateral or vertical boundary of your airspace. Depending on speed, this may be 10-15nm laterally or 4000-6000FT vertically.

You don't have to wait until the last minute to hand off and transfer an aircraft. In fact, if you are busy and have no further need to talk to an aircraft, initiate an early transfer by handing off the datatag.

Do not transfer the aircraft until the handoff has been accepted.

Vertical Separation

1000FT vertical separation provides an adequate safety margin between IFR aircraft. However, old altimeters became inaccurate at high altitude therefore the 1000FT vertical separation between aircraft was increased to 2000FT above FL290. This separation arrangement of 1000FT up to FL290 and 2000FT above FL290 is known as "standard" vertical separation.

RVSM Aircraft

Modern altimetry equipment and autopilots are capable of more accurately maintaining a set level. Aircraft fitted with this type of equipment can be certified as RVSM approved aircraft, which means the separation standard for this aircraft can be reduced from the standard 2000FT to only 1000FT when operating between FL290 and FL410 inclusive.

RVSM Airspace

This “reduction” of vertical separation from the “standard” is known as Reduced Vertical Separation Minima (RVSM). Where implemented, the band of levels FL290 and FL410 inclusive is known as RVSM airspace. RVSM Airspace has been progressively introduced in various parts of the world since 1997 and is in place throughout all Australian airspace.

Figure1. - Flights below FL290 and RVSM Aircraft within the RVSM band.

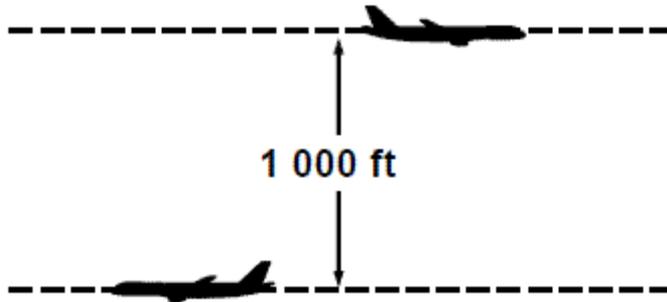
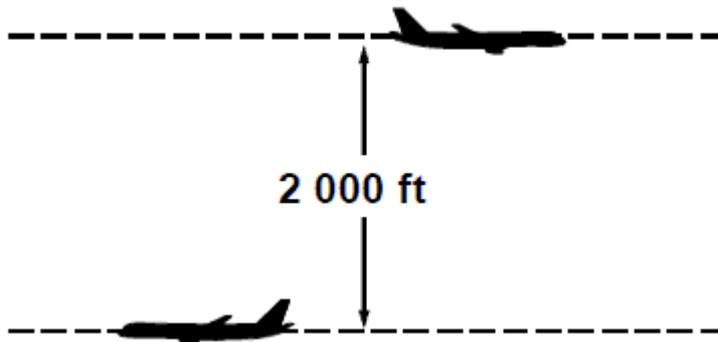


Figure2. - Flights above FL410 and Non-RVSM aircraft in the RVSM band.



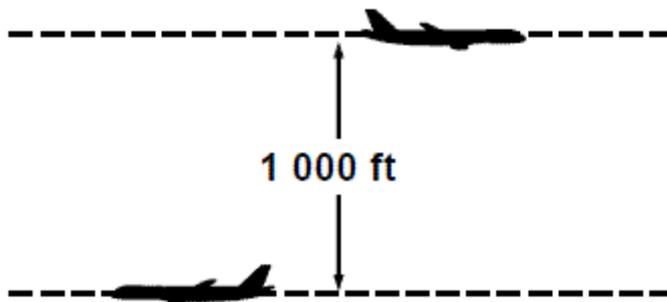
So to summarise...

Aircraft	Vertical Separation
Above FL410	2000FT
Within the RVSM band (FL290-FL410 inclusive)	1000FT - RVSM Aircraft 2000FT - Non RVSM Aircraft
Below FL290	1000FT

Applies appropriate vertical separation to aircraft operating in the RVSM band.

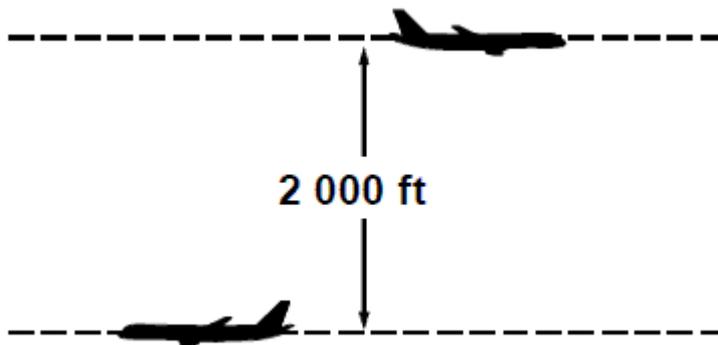
Separation for RVSM Approved Aircraft

Within the RVSM band (FL290-FL410 inclusive) aircraft with RVSM capability may be separated from each other by a 1000FT separation standard as shown below.



Non RVSM Approved Aircraft

Within the RVSM band (FL290-FL410 inclusive) we must apply a 2000FT separation standard between a non-RVSM aircraft and any other aircraft as shown below.



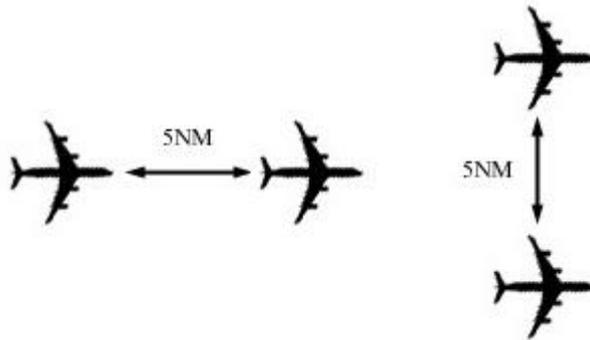
Applies separation between aircraft in radar environment

Separation Standards

As you will see in the next few competencies, the requirement to apply a prescribed separation standard depends on the category of flight (IFR or VFR) and the class of airspace in which the aircraft are operating.

The two basic standards used for Enroute aircraft in a radar environment are:

- 5NM lateral/horizontal



Important: The 5NM standard is an absolute minimum. In some cases you will have to apply a larger standard for wake turbulence separation.

Pre-emptively applies separation assurance to avoid rather than resolve conflicts

Separation assurance

Try to avoid relying on one separation standard to guarantee separation between aircraft but rather rely on two or three at any given time. If necessary when using a single separation standard, have one or two other strategies planned out and ready to activate at a moments notice.

For example, if a radar vector doesn't go quite to plan is there something else to back it up; such as a vertical separation standard?

Always ensure that you can assure separation will be maintained even if things go slightly wrong. To achieve this; always have a redundancy plan up your sleeve.

Separation can be assured by placing a requirement on the pilot to achieve something prior to a set time or place. That way if your attention is drawn away to another situation, the separation will be assured regardless of whether you are monitoring the scenario or not.

e.g.'Cathay 402 climb and maintain Flight Level 350, cross OCEAN at FL230 or above'

The responsibility for separation still remains with ATC. In this instance however, rather than the ATC having to constantly monitor the situation for separation throughout and 'guessing' whether separation will be maintained, it has been assured by the use of this ATC instruction.

Avoid rather than resolve

Conflict is addressed long before it becomes a situation requiring remedial action. Look for possible conflicts long before they need to be resolved at the last minute.