



ENROUTE CONTROL

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1. General

The Enroute controller, also known as Center or Area controller, takes care of all aircraft enroute from their departure airport to the destination airport. He serves flights during the climb, cruise and initial descent phases.

The main task on that is, to keep all aircraft in the airspace, he is responsible for, at a safe distance from each other. That means lateral as well as vertical. The upper limit of the controlled airspace class A is FL600. Most modern commercial airplanes are certified to climb up to FL410. This is already a physical limit to fly below the sound barrier based on aerodynamical basics.

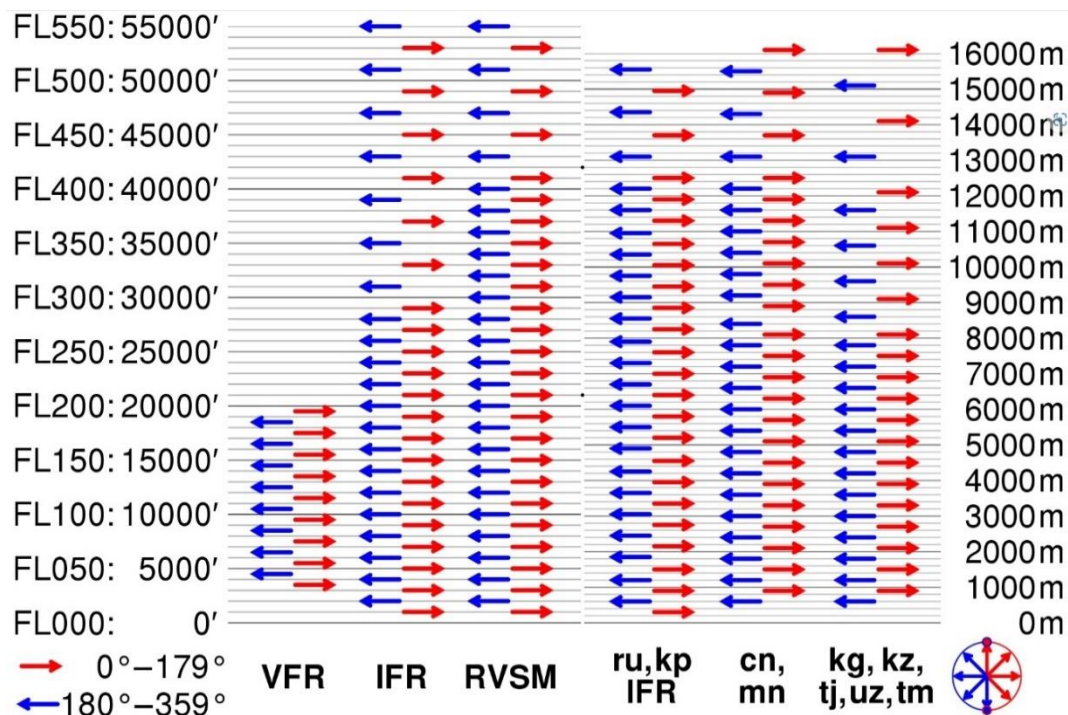
There are two kinds of control:

- Radar Control Service
- Non-Radar Separation

Radar control refers to radar data to manage the air traffic. It involves monitoring aircraft positions, speeds, and altitudes by using radar systems.

Non-radar separation is the rule and regulation used by Air Traffic Control to separate aircraft when there is no radar available e.g. in areas over the sea. Here the separation is based on frequent position reports from the pilots. A safe distance in this case usually is 10 minutes for planes on the same route and flight level.

In the simulation in Thailand, we are using Radar Control Service only. The Thai airspace is defined as RVSM airspace (Reduced Vertical Separation Minimum). The minimum distance between two airplanes on the route is vertical 1000 ft up to FL410 and lateral in the same altitude or on the same flight level 10 NM. Above FL410 the vertical separation is 2000 ft.



Used flight levels in civil aviation.

Some countries are using metric flight levels for example Russia, China and some others. Unfortunately the solutions on metric levels differ and are not the same in every of those countries.

In the real world the Thai airspace is divided into 12 subsectors with separate controllers and different frequencies. The call sign for any of the stations is Bangkok Control.

1.1. Airways

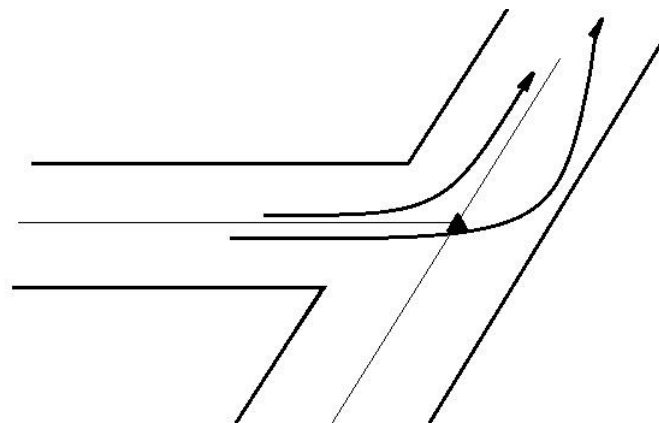
IFR flights in the airspace have to fly on certain airways depending on their navigation equipment. The Thai airspace provides 3 kinds of routes. This are:

- ATS routes
- RNAV routes
- ATS and RNAV routes

Airways are designated by a letter that specifies the kind of airway and a following number with one to three digits. The following letters are used as designators for the different types.

- A, B, G, R, routes in a network of ATS routes they are not RNAV routes,
- L, M, N, P, RNAV routes in a network of ATS routes,
- H, J, V, W, routes, not part of a network of ATS routes and are not RNAV routes,
- Q, T, Y, Z, RNAV routes which are not part of a network of ATS routes.

The specifications for the route include the route designator, the magnetic track to or from the next waypoints, the distance between the waypoints and upper and lower flight limit. Like some roads on the ground, they may also be just declared as one-directional airways. The airway itself is in practice not only a line the airplane has to follow on its route in the air, per definition is it a way with a usual width of +/- 5 NM from its center line.



An airway in reality.

RNAV routes can be taken by airplanes they have the capability from the navigation system to fly any desired flight path, defined by waypoints as geographic fixes (LAT/LONG) and not necessarily by ground nav aids as e.g. a VOR.

For more information about RNAV:

[Diapositive 1 \(icao.int\)](https://www.icao.int)

[ENR 3.3 Area Navigation \(RNAV\) Routes \(faa.gov\)](https://www.faa.gov)

2. The Practice

The enroute controller has to handle basically two types of flights. This are:

- a) Domestic flights. Domestic flights are flights departing and also landing inside the national airspace. These flights are during their entire enroute phase under control of the enroute controller
- b) International flights. Here the flights can be divided into three more groups.
 - Departing flights
 - Arriving flights
 - Crossing flights

Departing flights are starting at an airport inside the FIR and will leave the country on their route via a so-called exit point.

Arriving flights will enter the FIR on an airway and intend to land at an airport inside the country.

Crossing flights just overfly the FIR to their final destination and are under control only during the time in the national airspace.

2.1. Departing Aircrafts

After the approach controller handed over the aircraft to the center controller the pilot will call: "Good day, Bangkok Control, at FL150, Thai123".

The controller:

"Thai123, Bangkok Control good day, identified at FL150, follow route as filed, clear cruising flight level 350".

The pilot confirms:

"Follow route as filed, clear cruising flight level 350, Thai123".

Up to this point it is the same with domestic flights departing at an airport in Thailand.

We assume that Thai123 is flying to Hong Kong on airway A1. The exit point from the Thai airspace in this case is the waypoint BUTRA. At least one minute before the plane reaches that point, it should be transferred to the enroute controller in Laos.

Controller:

"Thai123, you are leaving my airspace, contact Mekong Radar on 132.1, good day".

As alternative, if Mekong Radar is not present, the controller advises:

"Thai123, you are leaving my airspace, change to UNICOM 122.8, good day".

2.2. Arriving Aircrafts

An airplane entering the Thai airspace will contact the ATC like:

"Good day Bangkok Control, 10NM south of TIDAR on FL380, Thai123".

The controller responds:

"Thai123, Bangkok Control good day, identified on FL380, follow your route as filed".

Pilot:

"Follow route as filed, Thai123".

The airplane will follow its defined route until the TOD (Top Of Descend) is near. From up here the procedure for domestic flights is again the same. The pilot requests:

"Request descend, Thai123".

The controller:

"Thai123, clear to descend, expect DOLNI3C arrival for runway 19L, reach FL160 at DOLNI".

Pilot:

"Clear descend to FL160 at DOLNI, expect DOLNI3C for runway 19L, Thai123".

Near the waypoint DOLNI the Bangkok Control can hand the plane over to the approach controller.

"Thai123, contact Bangkok approach on 124.35, good day".

2.3. Crossing Aircrafts

On their way from abroad to the final destination some flights just cross over the FIR and continue the flight to the next country. Most of these flights have to take their way via the waypoint BKK which is the Bangkok VOR at Don Muang airport, as here a lot of airways have their crossing point.

Again, an airplane enters the Thai airspace and reports:

"Good day Bangkok Control, at BETNO on FL390, Vietnam 224".

The controller responds:

"Vietnam 224, Bangkok Control good day, identified on FL390, follow your route as filed".

Pilot:

"Follow route as filed, Vietnam 224".

During the entire flight over the Thai airspace is no further action from the controller necessary, as long as no change, e.g. the flight level is needed.

When the flight then is near the exit point to the next country the controller instructs:
"Vietnam 224, you are leaving my airspace, contact Mekong Radar on 132.1, good day".

3. FIS (Flight Information Service)

A Flight Information Service is an air traffic service that is available to any aircraft within the flight information region. It is defined as information helpful to the safe and efficient operation of the flight and includes information on other potentially conflicting traffic.

Flight Information can also include:

- Meteorological information
- Information on aerodromes
- Information on possible hazards to flight

All Air Traffic Service units will provide an FIS to any aircraft, in addition to their other tasks.

3.1. FIS In Practice

FIS will be provided on request. A sample here from a VOR flight on his route:

"Bangkok Control, C172 VFR to Chiang Mai, 20NM South East from PSL VOR in 4000 ft, request flight information service with weather for the route, HSFAT".

The controller:

"HSFAT, Bangkok Control, identified, in your altitude are no other planes detected, CAVOK".

A word to "CAVOK". This describes weather conditions for VFR flights and is the abbreviation for **C**louds **A**nd **V**isibility **O**K.

4. Emergency Cases

In case an airplane is signaling a case of emergency by setting the squawk according, the controller should select an airport on the route, capable to allow a safe landing for the type of aircraft in agreement with the pilot. Then the plane must be guided down.