

TOWER OPERATION (TWR)

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1. The job

The tower controller is the one who gets departing planes in the air as well as arriving ones safely back on ground. This for IFR- and VFR flights. Further on he is responsible for all traffic in the ATZ (Aerodrome Traffic Zone). Here especially for proper separation between airplanes inside this zone.

For VTBS the zone has a radius from 5 NM around the airport center from SFC to 2000 ft MSL. The airspace class is C, what means all flights are subject to Air Traffic Control service and IFR flights are separated from other IFR flights and from VFR flights. VFR flights are separated from IFR flights and receive traffic information in respect of other VFR flights. The operation area for the tower on ground are the runway(s) only.

The tower controller also decides in which direction the runway(s) are to use. He is doing that by analyzing the wind information. Furthermore, he has to setup the ATIS (Automatic Terminal Information Service). This is a broadcasting service that gives pilots the local weather information as wind and QNH and also the information which runway is in use.

2. Departing aircrafts

2.1. The easy way

An aircraft that is ready for departure will contact the tower as:

"Hold short runway 19, ready for departure, Thai123".

The tower controller then can clear the airplane if the runway is free and no other plane is on the final approach for the same runway.

"Thai123, wind 200 at 6, runway 19 cleared for takeoff, report airborne".

The pilot will confirm:

"Runway 19 cleared for takeoff, Thai123".

Important is, that there is always the information to the pilot about the current wind situation.

When the plane is airborne the pilot reports:

"Airborne, passing 1500 ft, Thai123".

If the next station is online, the controller will answer:

"Thai123, contact Bangkok approach on 124.35".

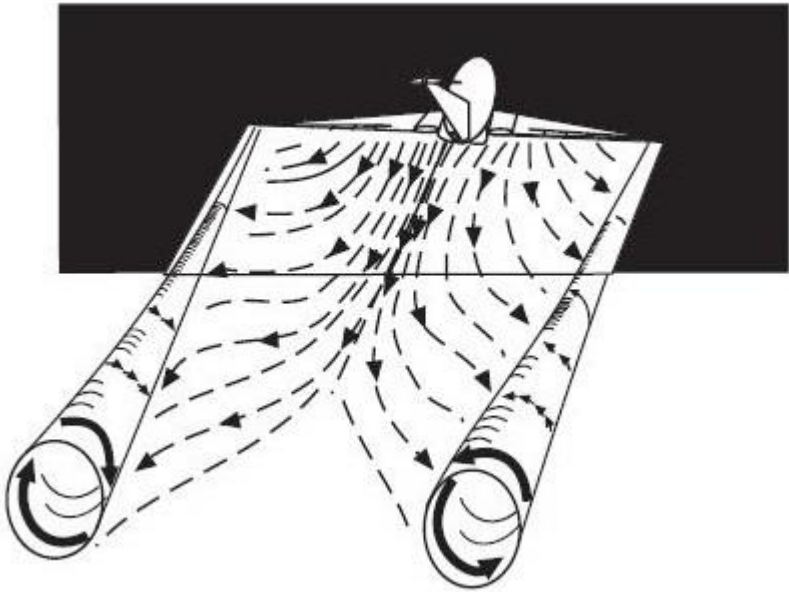
Otherwise he lets the plane monitor advisory.

2.2. Wake turbulence

Anything so far is fine. But how to proceed if there are more airplanes ready to go? First it needs an additional definition that the runway is really clear.

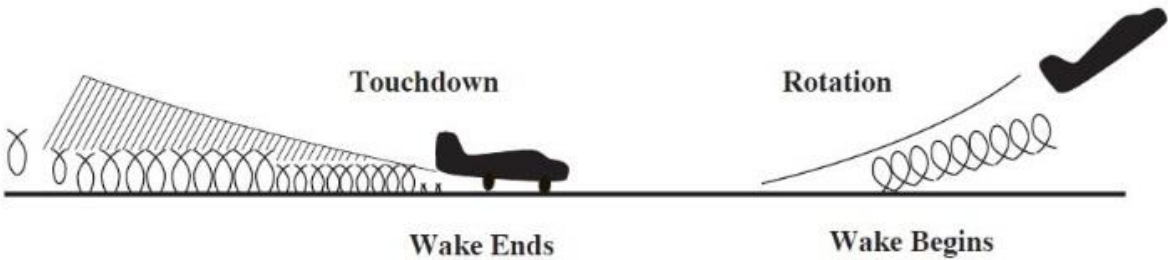
Here the controller has to consider the wake turbulence. The wake turbulence is created at the wing tips and is there as long as the aircraft moves. As bigger planes create a stronger wake turbulence than smaller ones there is a classification into categories.

- Light (L) -- aircraft types of 7,000 kg or less.
- Medium (M) -- aircraft types more than 7,000 kg but less than 136,000 kg.
- Heavy (H) -- all aircraft types of 136 000 kg or more, except types in (J) category.
- Super (J) — aircraft types as for example A380.



Wake turbulence from a plane.

On the runway then during start as well during landing there some turbulences quite danger for planes follow up.



Situation on the runway during landing or start.

To minimize the risk for following planes there are some waiting times defined based on the category of the planes.

Leading	Trailing		
	Heavy	Medium	Light
Heavy	1 min	2 min	2 min
Medium	1 min	1 min	2 min
Light	1 min	1 min	1 min

This are the minimum waiting times for a trailing plane after the leading one is airborne. The same separation should also be used for landing airplanes.

There is another waiting time that must be used in the case that leading and trailing plane depart on the same SID. In this case the trailing one has to wait for 3 min. That is not because of possible turbulence, the reason is separation.

The controller can in such a case always if there is no other aircraft in the final approach, instruct:

"Thai648, line up runway 19 and wait".

3. Arriving aircrafts

3.1. Normal procedure

Aircrafts on the final approach will contact tower as:

"Good day Suvarnabhumi tower, on final approach to runway 19, thai341".

The controller:

"Thai341 Good day, Suvarnabhumi tower, wind 210 at 8, runway 19 clear to land".

The pilot:

"Runway 19 clear to land, Thai341".

That is the normal procedure for a landing. There might be some exceptions like the runway is at the time not really clear because a previous landed plane has not cleared the runway completely for whatever reason. In such a case the tower can answer:

"Good day Thai341, Suvarnabhumi tower, wind 210 at 8, expect late clearance".

When the runway then is clear the controller instructs:

"Thai341, runway 19 clear to land".

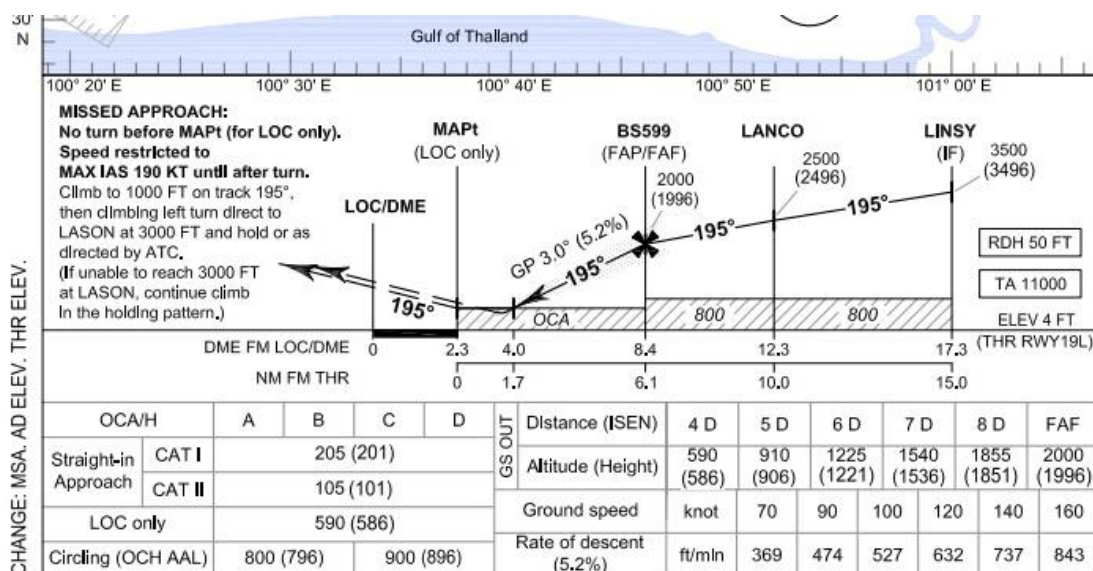
The controller should not contact the aircraft anymore from a distance of less than 4 NM from the runway. The reason is that the crew from there is busy with preparing the landing according to the check list.

The only exception should be a Go-around instruction because of an unforeseen problem.

3.2. The Go-around

Go-around is the key word for an interrupt of the final approach to the runway. It might be also called as Missed Approach. It can be either initiated by the pilot or it can be an instruction from the ATC for a reason the pilot might not be able to determine.

How to proceed might be from airport to airport different. The pilot will always find the instruction in the charts for the final approach to the runway. Here a sample for the ILS approach to runway 19 on VTBS.



Instructions for a missed approach.

However, the aircraft for this procedure has to handed over to the next controller to prepare a new attempt. In case the pilot reports a Go-around:

“Thai123, follow missed approach procedure, contact Bangkok approach on 124.35”.

For the case that the controller initiates the Go-around:

“Thai123, Go-around, follow missed approach procedure, contact Bangkok approach on 124.35”.

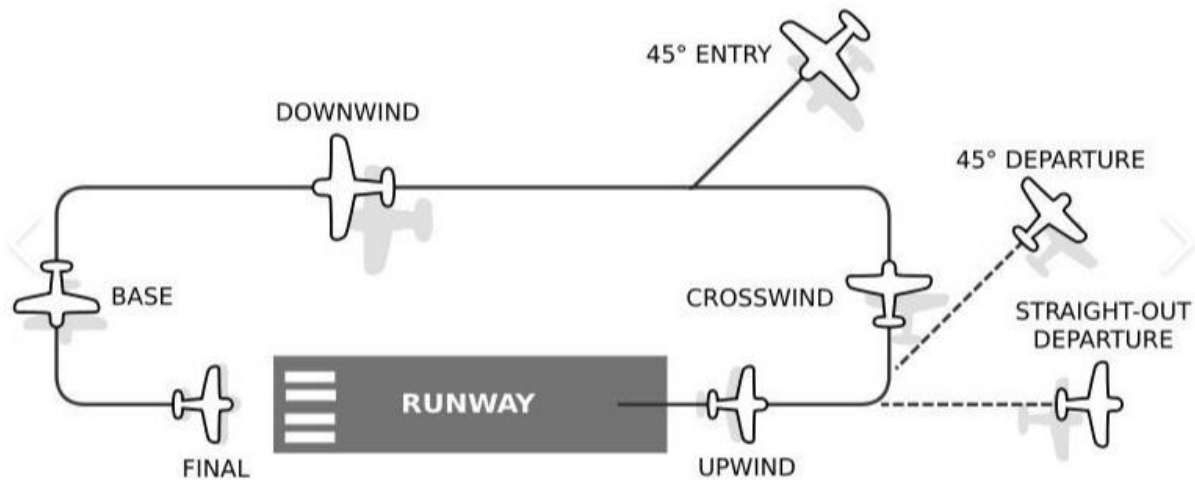
4. VFR operation

4.1. Traffic pattern

Traffic patterns are the base for VFR flights on any airport in the world. It allows the pilot e.g. for the landing to start the final approach from always the same altitude and the same distance to the runway.

The picture shows a typical VFR traffic pattern with entry and exit points. Typical because the turns are left turns. The so-called right traffic pattern should be avoided if possible because the

pilot has to fly always right turns and in a right turn for the reason of his seat position he cannot be sure for the proper separation.



Typical VFR traffic pattern.

For the altitude in a traffic pattern there are international standards depending on the type of aircraft.

- 500 ft AGL for Helicopters,
- 1000 ft AGL for Small Aircraft,
- 1500 ft AGL for Jet or Turbo Prop.

4.2. The practice

A Cessna 172 is ready for departure under VFR for traffic pattern contacts the tower:
"Hold short runway 19, ready for departure, HSFAT".

The tower controller repeats the clearance:

"HSFAT, clear for VFR traffic pattern runway 19, maintain 1000 ft, report Downwind and intension, wind 180 at 5, runway 19 cleared for takeoff".

Pilot:

"Runway 19 cleared for takeoff, will report Downwind, HSFAT".

Or if there is as target another airport:

"HSFAT, clear VFR to Hua Hin, climb to 1000 ft and turn left heading 270, report 5NM_EAST, wind 180 at 5, runway 19 cleared for takeoff".

Pilot:

"Runway 19 cleared for takeoff, will report 5NM_EAST, HSFAT".

If the pilot reports the VFR reporting point 5NM_EAST then the controller hands him over to the next controller or even to advisory.

4.3. Incoming VFR flights

If planes under VFR rules want to enter the ATZ, they have to contact the tower at least in a distance from 10 NM to the airport. Here:

"Good day Suvarnabhumi tower, Cessna 172 VFR from Hua Hin, 10 NM South East from 5NM_EAST in 2000 ft, request landing information for full stop, HSFAT".

The tower controller gives as information:

"HSFAT Good day, Suvarnabhumi tower, QNH 1012, active runway 19, enter ATZ via 5NM_EAST below 2000 ft, join traffic pattern runway 19 in 1000 ft, report Downwind".

From this point the procedure for both, arriving or just traffic pattern, is the same:

"On Downwind for full stop, HSFAT".

TWR if the approach is clear:

"HSFAT, clear Final runway 19, report on Final".

This is an important instruction as the VFR pilot may not realize that e.g. another aircraft is on the final ILS approach. In case it is like that the controller has to instruct:

"HSFAT, extend Downwind as there is another incoming plane".

When the incoming plane has passed the clearance for the Final can be given.

Pilot after the clearance:

"On Final 19, HSFAT".

TWR:

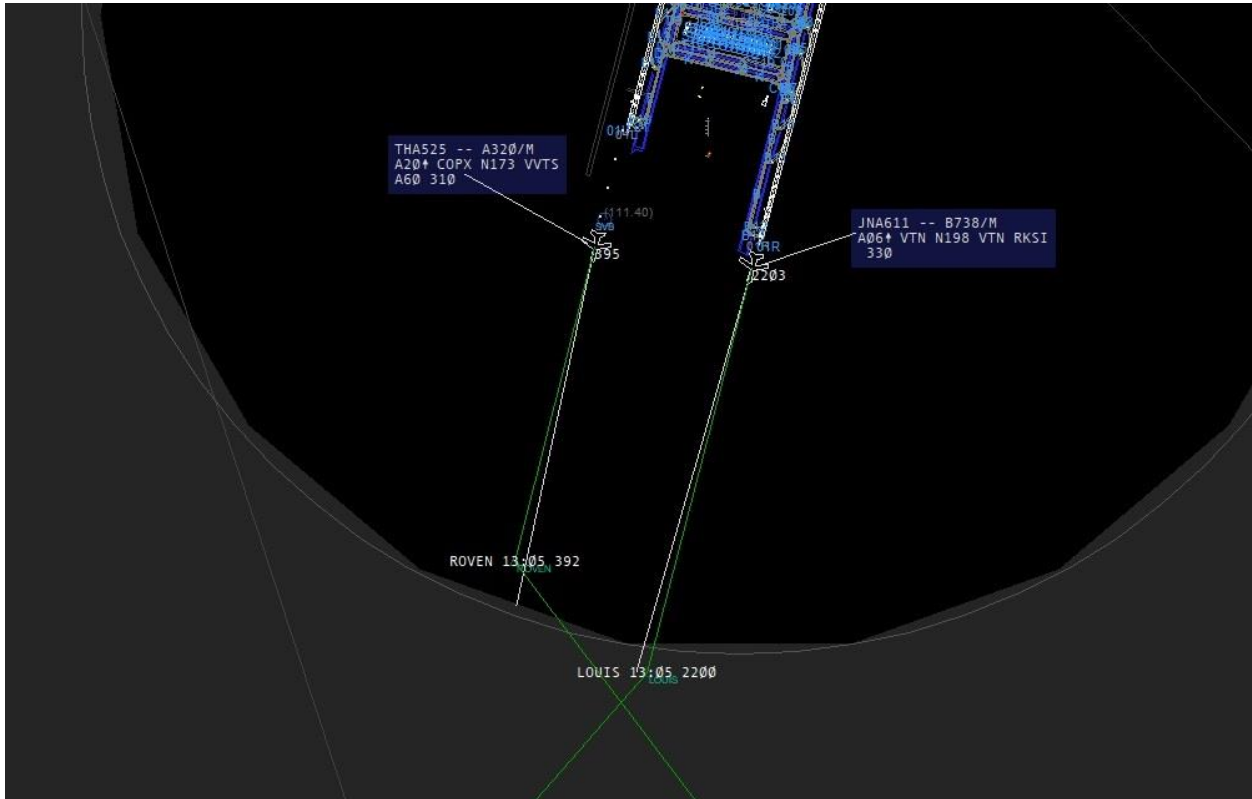
"HSFAT, wind 210 at 8, runway 19 clear to land".

Pilot:

"Runway 19 clear to land, HSFAT".

5. Avoiding problems

The VTBS airport has two parallel runways. As the distance of this runways is bigger than 4300 ft (7200), the runways can operate independent. That means that start or landing on both runways is simultaneously possible.



Two planes are starting simultaneously on runway 19 and 20L.

In this case there was a problem not really seen by the tower controller. THA525 starting on runway 20L to Hoh Chi Minh City and JNA611 on Runway 19 to Seoul. Unfortunately there foreseen flight pads are crossing each other in a distance of about 5 NM from the airport. That will lead to a dangerous situation.

How the controller could have avoided this incident?

One possibility could have been to advise to each plane the other runway. The easiest way but would be to delay one of the aircrafts for one or two minutes.

Summary: Small things are able to create very big problems!

6. Emergency operations

The Tower controller must also be aware for emergency situations. An emergency situation is present when there is a plane that has activated the emergency code in the squawk setting like e.g. 7700. That code is a sign for an emergency based on a technical problem or there is something medical happened to passenger(s) or crew member(s).

If the plane is in radio contact with the tower and a runway is requested for the emergency landing or the next controller (APP or CTR) is in contact with the plane and announcing the emergency to the tower controller and the foreseen runway, The tower has immediately to stop any activity, means start or landing, on that runway and keep it clear for that specific aircraft.

Jan. 2024 By Dieter Schulz 1236303
Updated Oct. 24