Unit III - Tower Procedures

1- Introduction

Tower controllers ensure separation of aircraft in the vicinity of runways and in the air by means of both visual observation and radar. Although VRC does have the capability to enable the Tower controller to observe traffic visually with a multiplayer option, radar procedures will be emphasized in this module.

2 – Runway Selection

Runway selection can be easy at times and confusing at other times. Due to the various terrain all over Croatia, it can be difficult to choose and active runway. The runways are most commonly based on the winds. Since the METAR reports where the winds is coming from, all you have to do is pick the closest runway that goes into the wind. This is so aircraft on departure and arrival will have a headwind which allows them to get airborne faster on departure and have a lower groundspeed on arrival.

Choosing runways becomes more difficult when you have approaches to worry about along with terrain. For example, there are mountains on the departure path of runway 05 in Split and night time "Visual approaches" are banned there as well. So at night Split can only run on runway 05. This is a prime example of where the type of approach and terrain come into play. Other airports you have to take into consideration are Rijeka, Dubrovnik and Zadar.

3- Wake Turbulence

Although in Flight Simulation the effects of wake turbulence may or may not exist, wake turbulence procedures are simulated on VATSIM to enhance realism. A wake turbulence cautionary is required to be issued to any aircraft operating directly behind a heavy, or a light aircraft operating behind a medium aircraft.

4 – Departures

Tower may release departures at any time to the Arrival controller so long as the aircraft departs the active runway. For example, the active is runway 23 in Zagreb but there is an aircraft wishing to depart from runway 05 and you approve it. The Tower controller cannot depart the aircraft unless the APP controller approves of it since there might be an aircraft on approach for runway 23. Any aircraft that departs from a non-active runway is considered a "non-conforming departure" since he/she does not agree with the standard runway operations currently in effect. Another example is an aircraft departing runway 22 in Zadar when runway 32 is active.

- Departures with Wake Turbulence.

Separate an aircraft operating directly behind or directly behind and less then 1000 feet below a preceding aircraft by one of the following minima:
Heavy behind a heavy - 4 miles
Medium behind a heavy - 5 miles
Light behind a heavy - 6 miles
Light behind a medium - 5 miles

Some people cannot tell the difference between a Light, Medium and a Heavy. The following is merely a guide. In real life they use the aircraft's MTOW (Maxiumum Take-off weight) to determine this. However, on VATSIM we do not have this freedom.

AIRCRAFT CATEGORYMTOW

Light Aircraft (L)	7 000 kg
Medium Aircraft (M)	7 000 – 136 000 kg
Heavy Aircraft (H)	>136 000 kg

A Light aircraft would generally be a C172 or a C152.
A Medium aircraft would range from a ATR72 to an A320.
A Heavy would be a A321/B753 to an A340.

As a controller you can disregard the wake turbulence separation if the pilot truly wishes to depart. It is not fully the Tower controllers responsibility to make sure this guide is followed but the pilot's responsibility.

– Departure Spacing

Spacing between departures is roughly 3 miles if both aircraft are in the same category. Once the second aircraft rotates the 1st aircraft should be at least 3 nm ahead. Which means you can issue a take-off clearance before the 1st aircraft is 3nm away from the runway.

Be careful as aircraft can catch up to other aircraft. An A320 will catch up to a ATR if the ATR isn't given a turn out on departure since the A320's speed is much higher than that of an ATR on departure.

– Prop Departures

If you find that your sector is busy and you have prop aircraft in your departure line then give them a turn out on departure. By giving them a turn out on departure, you eliminate the possibility of a jet aircraft catching up to them when they depart. This increases efficiency in your zone while maintaining a level of safety. If you issue a turn to an aircraft on departure, notify the approach controller so he/she is not clueless to the situation. Generally, a turn for a prop will be at least 30 degrees off from the runway heading.

– Control Transfers (Departures)

Tower should not track departing aircraft unless the situation arises and you must track the aircraft. For example, a VFR flight out of LDZA should be tracked since he will not be in contact with APP. However, to increase efficiency, tower controllers

should send aircraft to the approach controller immediately because the tower really has no purpose to the aircraft once he is airborne.

Also, make sure that aircraft are squawking the correct code and that they have the transponders set to Sqwk C/Norm when departing.

– Arrivals

The arrival controller will handoff aircraft to you on their arrival stage of flight. Although it is the arrival controllers responsibility to ensure the minimum separation is maintained on arrival, if you find that two aircraft might lose their separation, you should step in to prevent that from happening.

Once an arrival aircraft has landed, you should instruct them to taxi to the assigned gate as required. If you have another arrival, they receive more priority because they need their landing clearance and the other aircraft can wait for his taxi clearance. This is where you learn to prioritize.

– Departures and Arrivals

We can enforce two requirements here:
a- A departure must be airborne before an arrival reaches 2 miles final or,
b- A departure must be on its takeoff roll before an arrival reaches 2 miles final

– Missed Approaches

Any aircraft that goes on a missed approach must be given instructions by the tower to avoid conflict with other aircraft. An aircraft on a missed approach is considered a departure and should be handed back off to APP as soon as possible with safety in mind. Generally, runway heading to 4000ft is acceptable but sometimes a conflict may arise and another heading must be issued. For example, at Split an aircraft in on the missed approach for runway 05. The controller may issue heading of 180 and 4000ft.

– Aerodrome Circuit

The aerodrome circuit is the standard pattern shown above. It regulates a standard pattern to which VFR aircraft fly around the airport. A standard circuit is left-hand at the pilot's convenience. Sometimes, due to terrain or other circumstances, the circuit is changed to a right hand circuit. Please refer to local aerodrome charts for the direction of the circuit at that airport.

– General

On tower you are not in a position to vector aircraft. This means that if APP/CTR are

offline and there is an arrival, you cannot guide them to the runway. You can contact them and let them know what the actives are and to call you on a 10nm final. Tower is a VFR position which means you cannot vector. You cannot guide aircraft as an approach controller and you cannot guide aircraft on departure to their initial fix and clear them on course.

If you receive a request from a pilot and you have no good reason to deny it, it is your responsibility to accommodate that request. If you are controlling Zadar Tower and the active is 32 and the pilot asks for 22. If you have not good reason to deny it, the pilot should be given runway 22. ATC is here to accommodate and help pilots, that is our duty.

Departures

1- Specify the name of the taxiway or intersection with the instruction to taxi or backtrack to position. This rule attempts to raise the situational awareness of traffic in the vicinity of the runway by being more specific with a location.
"Croatian 425, Zagreb Tower, at Charlie line up runway 05"

2- There are many situations which require the controller to issue a wake turbulence cautionary to a pilot.
"9A-MST, caution possible turbulence from the Airbus 330 departed ahead, cleared for takeoff runway 23 winds 230 @ 17."

3- If a situation arises in which an opportunity exists to depart an aircraft only if they are ready and able to proceed with no delay, a clearance for an immediate departure may be issued once it has been ascertained that the aircraft is able to depart with no delay. If the aircraft is able an immediate departure, then the takeoff clearance must contain the word "immediate"

"Skytour 062, tower are you able an immediate departure?"
"Skytour 062, wind calm, cleared immediate takeoff runway 05"

4- It is permissible to taxi more than one aircraft onto the same runway for departure provided that that the aircraft are sequenced and traffic information is exchanged, and the aircraft that is not number one for departure is sequenced.

"9A-MST, Tower, line up runway 05 at taxiway C."
"Malev 428, tower taxi to position runway 05, #2 for departure, a Cessna 310 is #1 for departure ahead from taxiway C."

Arrivals

7- Initial contact with arrivals should include runway, wind, and QNH information to be issued to all arriving aircraft. Since APP will assign the runway and give the local QNH, Tower usually does not have to unless it is a VFR aircraft. However, APP will not give the surface wind information. For this reason wind information should be issued to the pilot, especially if the wind is over 15 kts when a landing clearance

cannot be issued on initial contact. In cases where an arriving aircraft cannot be cleared to land on initial contact, they should also be given relevant information as far the present traffic situation is concerned. For example information on their approach sequence, the type, and distance of traffic ahead on approach, and if traffic will be departed from the runway before they will be landing should be passed to the pilot if possible to increase their situational awareness.

"Croatian 857, Tower, #2 runway 05, traffic is a Beech 1900 4 miles ahead, wind 080 at 12, continue"
"Croatian 857, Tower, #1 runway 05, Airbus 320 to depart, wind 080 at 12, continue"

8- As in the case for departing aircraft, appropriate wake turbulence information should be issued to arriving aircraft when the situation warrants.
"Cessna 9A-LJM Tower, #2 runway 05, caution possible wake turbulence from a heavy Boeing 777 short final, wind 030 at 8, continue"

9- When a situation arises in which an aircraft will either be issued a late landing clearance or may be required to execute a missed approach, they should be informed as soon as possible in order to prepare themselves. If the controller is able to, they should relay the missed approach information to the pilot in advance so they will be better prepared if, in fact they will be required to execute the missed approach.
"Olympic 423, continue #1, expect a late landing clearance, traffic to vacate 23, in the event of a go-around fly heading 230, maintain 3000"

"Olymipc 423, pull up and go-around traffic on the runway, fly heading 230, maintain 3000"

10- A landing clearance, in the same manner as a takeoff clearance, should contain the necessary elements of runway, and wind information along with safety precaution information.

"Croatian 425 winds calm cleared to land runway 05."
"Croatian 425 departing A320 ahead winds calm cleared to land runway 23."

Information regarding VFR aircraft will come at a later stage in training. Just be aware of different classes of Control Zones and requirements to fly VFR.