S3 Position Overview
March 2021

Position Overview

Approach is responsible for all movements within its given Terminal Maneuvering Area (TMA) and gives appropriate instructions to enforce proper sequencing and separation for departing and arriving aircraft in the air, passing within the TMA, including its runway final area. Approach covers all Tower responsibilities on a top-down basis in the case of the local Tower position being offline. Departing aircraft are typically handed over to Approach after they have departed from the aerodrome. Arriving aircraft are typically handed over to Approach shortly before they enter the TMA (incl. Both horizontally and vertically). Upon leaving the TMA (both horizontally and vertically), departing aircraft are handed over to the next controller (typically either CTR or EURE_FSS). The main objective of an Approach controller is to ensure safe separation between departing and arriving aircraft that are passing within the TMA and also to create a safe distance and arriving sequencing separation for aircraft on the final leg before landing at the arriving aerodrome, whilst making sure that this is done in a both time- and economy-efficient manner.

Upon connecting to the VATSIM network as an Approach controller, one shall select the active runways for the aerodromes which the APP position covers within the given TMA. As an approach controller, one should coordinate with CTR or TWR, if applicable regarding current operations, winds, runways, etc.

Approach Responsibilities

Sofia Approach is responsible for all aircraft movements within the Sofia TMA, which vertically starts at 4000ft and ends at FL245. Traffic within the Sofia CTR that is below 8500ft is typically the responsibility of the TWR controller, however for IFR departures and arrivals, these are not separated by TWR and are the responsibility of the approach controller. These can and should be handed off to the next controller as soon as possible. The Sofia CTR and TMA are all considered class C airspace and so an approach controller may receive and handle VFR traffic, if the traffic workload permits the controller to do so. Class G

airspace is typically located below the TMA airspace. The limit between Class G and the Sofia Class C TMA depends and is different in various areas of the TMA (see LBSF Visual Approach chart for more details, https://bgvacc.org/lbsf-charts/). Within the LBSF, LBWN and LBBG TMAs (the only 3 airports with APP positions in Bulgaria), the transition altitude is 12,000ft and the transition level is always FL130.
Within Class C airspace, IFR and VFR traffic must be separated by the controller. VFR traffic within the airspace shall be informed of other surrounding VFR traffic.

In addition to handling the above-said traffic, an Approach controller may also experience IFR traffic circuits. An IFR circuit is a procedure where an aircraft takes off in an IFR manner and is vectored by the Approach controller into the ILS sequence of the runway using altitudes, headings and speed. IFR circuits typically conduct standard go-around procedures after takeoff and are then vectored by Approach into the ILS sequence, after which the aircraft commits to either a touch-and-go, a full stop landing, a stop and go, a low approach and more.

Separation
Within the TMA, aircraft shall either be separated vertically by 1000ft or at least by 3nm. However, upon final sequencing, aircraft shall be separated by at least 6nm in order to allow one departure between each arrival. However, this may depend depending on the number of departures within the aerodrome. In many cases in general, the Approach controller shall always coordinate with the appropriate Tower controller in order to evaluate the departure and arrival sequences in order to create the best possible outcome. In cases where Approach has coordinated with Tower and they have both agreed to let 2 arriving aircraft land one after the other without interrupting the arrival flow, i.e. without another aircraft departing in-between, a minimum sequencing separation of 3nm may be used. Such separation can be achieved through speed control, altitude or by using vectors. However, there are exceptions to these separation rules, when it comes to wake turbulence. Appropriate wake turbulence should also be applied in separation when two aircraft follow each other. The distances for wake separation are as follows:

MEDIUM follows HEAVY - 5 NM
LIGHT follows HEAVY - 6 NM
LIGHT follows MEDIUM - 5 NM
HEAVY follows HEAVY - 4NM

In order to provide such separation between aircraft, an Approach controller shall mainly use 3 separation techniques and when able, use them in the following order: Speed Control, Vertical Separation (altitude) and Horizontal Separation (headings, etc.). So, a controller shall always attempt to first use speed control, then to use vertical separation and ultimately, if this is still

required, horizontal separation. These can and should also be used combined. SIDs are usually specifically designed to ensure and provide enough separation between arriving and departing traffic. Separation should be applied in a way which will not serve a risk of potentially leading to a loss of separation and a hazardous conflict. This includes preventing so called "cleared conflicts". This means that instructions must not be given if they potentially lead to a loss of separation if no more instructions are given in the future.

Descent instructions and limitations

An arriving aircraft shall always be given appropriate descent instructions that are safe and efficient. Descent instructions shall be given until the aircraft is cleared for the approach towards the aerodrome. Descent instructions above the transition level shall be given in a "flight level" (altitude in standard QNH1013, divided by 100) and in the aerodrome altitude on the aerodrome QNH below the transition level. When an aircraft is transitioning from a flight level to the altitude, the aerodrome QNH shall always be relayed to the pilot in the descent instructions.

ATC: LZB451, descend altitude 9000ft, QNH1025.

Descent instructions shall also be given in a way where separation can be ensured with other aircraft, and also in a manner where the aircraft does not descend below the appropriate TMA minimum vectoring altitudes (MVAs). This is particularly important in the Sofia (LBSF) TMA, which is surrounded by terrain and has various MVAs. An aircraft shall be descended appropriately until they are at a low-enough altitude to capture either the ILS glideslope, the RNAV descent profile or the visual approach profile. Again, this all depends on the approach type and the position of the aircraft intercepting on the extended approach centreline. There is one exception which allows ATC to descend aircraft below the MVA. This requires the pilot to have visual contact with the ground, before descending **visually** to an appropriate altitude (Since this procedure is only used in Bulgaria, remember not to use this outside of Bulgaria). However, due to the limitations of VATSIM and new learning pilots not always knowing the meaning of such complicated unusual phraseology, it is not always recommended to use this method, however it can be used if needed/deemed appropriate.

ATC: LZB451, do you have visual contact with the ground?

LZB451: Affirm, LZB451

ATC: LZB451, descend visually 3600ft, cleared ILS Z RWY27.

If an aircraft is not descending fast enough and is too high for their position, ATC may ask the pilot to expedite their descent.

ATC: LZB451, expedite descent.

Speed Control

Speed control is a very strong separation tool and technique used by radar control. Speed control can be given at any point of flight when the aircraft is in the air and shall be appropriate to the aircraft type. ATC can instruct an aircraft to fly a specific speed (in knots) or higher, the speed or lower, or to fly the exact speed.

ATC: LZB451, speed 220 knots or greater.
ATC: LZB451, speed 220 knots or less.
ATC: LZB451, speed 220 knots.

In addition, ATC may instruct the aircraft to fly their "minimum clean speed".

ATC: LZB451, maintain minimum clean speed.

ATC can also cancel any speed restrictions to the aircraft. This is known as having "no speed restrictions''. This means that all speed restrictions to the aircraft will be cancelled. Speed restrictions may also be set on the final leg of the approach (e.g. established localiser). These are described further below within this document.

Coordination with Tower

In Bulgaria, the aerodrome Tower controller always has to ask Approach for release clearance to depart the aircraft before lining the aircraft up. This is why it is important for Tower to coordinate with Approach a few minutes in advance to make sure there is little time lost during the coordination. This is done in order to have better control of the TMA, in order to not overcrowd the TMA and most importantly to avoid any potential conflicts with departing aircraft and other pre-existing aircraft within the TMA.

In addition, it is also advisable that Approach coordinates with Tower and informs them of every arrival that is close to being handed over to Tower on the final approach leg. This coordination can be done when the aircraft is a few minutes from being handed over to Tower, so this can be when the aircraft is on the base leg or is establishing/already established on the final.

Departing Aircraft

Upon entering the TMA, departing aircraft that have just departed from the aerodrome shall be radar identified by the Approach controller upon first contact. In order for the Approach controller to successfully identify the aircraft, they

have to be squawking Mode C and also have to have the correct squawk code set. If both requirements are met, Approach should be able to view the correct aircraft tag with the correct details and shall advise the aircraft that they have "radar contact". In case one or more of these is not met, ATC shall instruct the pilot to either set squawk mode C or to set the correct squawk code. Any additional instructions should also be relayed to the aircraft in the same message. This may be any relevant route directs or separation instructions, such as heading, altitude restrictions or speed restrictions.

LZB451 has just departed LBSF on the GODEK2T departure.

LZB451: Sofia Approach, hello, LZB451 GODEK2T departure, passing 2800ft.

ATC: LZB451, Sofia Approach, hello, radar contact, proceed direct GODEK.

LZB451: Direct GODEK, LZB451.

Route-Directs

An Approach controller may give route-directs to an aircraft to any point within their airspace (i.e. TMA). Any route-directs outside of the airspace have to be coordinated with the next sector controller. If the next sector controller is offline and the aircraft will be going to UNICOM, route-directs can be given if the aircraft requests the direct. An Approach controller also cannot climb an aircraft above their vertical airspace without coordinating with the next higher-up sector (typically, Sofia Control). In Sofia airport, initial climbs are already given to the highest possible levels (FL240 and FL230 westbound and eastbound departures respectively). However, it is possible and sometimes recommended to use the built-in Euroscope coordination tools in order to coordinate with the next sector (this may be Sofia Control or Belgrade/Adria Radar, depending on the aircraft SID or STAR) to give aircraft route-directs outside of the Approach TMA airspace and/or to give aircraft various levels of altitude. This should always be seen as an option and method to separate aircraft if this is required.

Arriving Aircraft

Aircraft are handed off to the Approach frequency shortly before they enter the Sofia TMA. This is done to allow the pilots and the controller to plan out the arrival. Upon first contact with inbound aircraft, the Approach controller shall relay the following information to the pilot: Cleared Assigned STAR or approach type (e.g. vectors), expected arrival runway and approach method and other instructions, such as descent instructions. Radar vectors, visual approach or route-directs to specific waypoints that lead towards the runway approach may also be given as cleared appropriate arrivals. In addition, upon first contact with any radar position, the aircraft must be radar identified with ATC. The

appropriate phraseology to establish this is to say "Identified". This can be achieved if squawk mode C is set and if the correct squawk is set. If either or both of these is not met, ATC should instruct the pilot to set squawk mode C and/or set the correct squawk assignment.

RYR8351 is inbound LBSF via NISVA.

RYR8351: Sofia Approach, hello, RYR8351 inbound NISVA, FL160

ATC: RYR8351, Sofia Approach, hello, identified, cleared NISVA3K arrival, expect ILS Z RWY27, descent altitude 12000ft, QNH1018.

RYR8351: Cleared NISVA3K arrival, ILS Z RWY27, descend 12000ft, QNH1018.

Pilots may also request specific approach methods or procedures if they would like to follow them. This may be for a variety of reasons, such as training. If the traffic and weather conditions permit the pilot to follow their request, ATC can approve such requests, however, this lies fully within the discretion of the ATCO.

Final Approach Sequencing

As stated before, aircraft shall be sequenced into the final approach sequence for the ILS, VOR, RNAV or visual approach (depending on airport or aircraft capability and also on pilot requests). In order to allow TWR to release one aircraft between two inbound aircraft, the Approach controller should aim at creating a minimum of 6-7nm separation. In cases where Approach has coordinated with Tower and they have both agreed to let 2 arriving aircraft land one after the other without interrupting the arrival flow, i.e. without another aircraft departing in-between, a minimum sequencing separation of 5nm may be used. ILS approach clearances shall be given if the aircraft is either following a course that is 30° or narrower, adjacent to the runway extended centerline, or if they are following a STAR/procedure, on-course towards the runway centerline. For example, for an ILS 27 approach, where the runway course is 270°, a maximum heading of 300° or 240° (depending on which direction the aircraft is coming from) may be given. This does not always apply when an aircraft is following a STAR or waypoint procedure. Where available, ILS Z approach should always be used instead of ILS Y and ILS Y shall only be used in case the pilot requests this approach. ILS Y is mainly used for training exercise purposes. This is different for RNP procedural airports, such as Plovdiv and Gorna. In case of an RNAV approach, a route-direct to a STAR or approach fix shall be given, along with the RNAV approach clearance. In case of a visual approach, the aircraft has to report having the runway in sight before being cleared for the visual approach.

In addition, for ILS, VOR and RNAV approaches, appropriate altitude instructions shall be given to the pilots, allowing them to establish on said approach. This varies between each approach type and the distances to various points along the extended centreline. These altitude restrictions can be seen on the appropriate approach charts.

> **ATC:** LZB451, turn left heading 300, descend 4000ft, cleared ILS Z RWY27

Once the aircraft is established on the final leg of the approach, various speed restrictions may be given to the aircraft in order to ensure separation within sequencing aircraft. Such instructions may include:

- Speed 160 knots (or greater/or less) until 4DME
- Speed 170 knots (or greater/or less) until 5DME
- Speed 180 knots (or greater/or less) until 6DME.

> Note: All speed instructions given after the approach clearance should include ”until” if they are to be followed after the approach clearance.

Handoffs to next Sector Controller

An approach controller should hand off aircraft to the next controller approximately 1-2 minutes before they enter the next airspace. Horizontally, this can be seen using the minute leader-lines. Vertically, this should be somewhere between 2500-4000ft before the aircraft leaves the vertical airspace.
This is different for arrival aircraft. If tower control is online during an arrival inbound into the airport, Approach should hand over the aircraft when the aircraft is established on the ILS/final of the arrival runway, and there are no speed restrictions that need to be set by Approach. If any speed restrictions need to be set, they should be set first and afterwards, the aircraft should be transferred to the next controller in the same message.

> **ATC:** LZB451, speed 160 knots until 4DME, contact Sofia Tower 118.100.

Tags

All aircraft that are controlled by radar controllers shall be “assumed” through the aircraft tag whilst they are on their frequency. This is not valid for positions such as TWR, as such positions do not have access to a radar and are not able to track aircraft through a radar. Upon first contact and radar identification with the aircraft, the Approach controller shall always “assume” the aircraft. This will indicate to other controllers that the aircraft is currently being controlled by the said controller. Aircraft that are assumed will appear in the controller’s sector exit list. Upon transferring people to the next sector controller, the Approach controller shall use the “transfer” option on the aircraft to transfer the aircraft to

the relevant controller. In most cases, the next controller is automatically assigned to the tag through the sector file by Euroscope, however, this may not always be the case due to various routing and/or technical issues. If this is the case, an Approach controller can either select the next sector using the tag or the sector exit list or can use the "manual transfer" option to transfer the tag to the next controller. If an aircraft has no further ATC available after the Approach sector and has to go to UNICOM, the Approach controller shall simply release the tag.

Holdings

During busy situations, such as events, the TMA may get very full and crowded. In cases where there are too many aircraft entering the TMA for an Approach controller to handle, the Approach controller shall coordinate with appropriate CTR controllers to introduce holds for inbound aircraft. Usually, for events, such holds are pre-planned in the event briefing. Some holds are published on the arrival charts, for example, the hold over GOL VOR for the GOL arrival into LBSF is published in the charts. It is preferable that CTR manages these holds and coordinates with APP when to send aircraft into the TMA. This relieves the workload on the Approach controller and allows them to focus on sequencing aircraft. Strong coordination is required between APP and CTR in order to manage the inbounds and the holds.

09 March 2021