APPROACH (TMA) AIR TRAFFIC CONTROL

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Chapter 1 – An Introduction to Approach/Departure control

1-1. This Thailand Departure/Approach Control Study Guide is designed to build on knowledge you have already gained in the Basic, Ground Control, and Tower Study Guides. Approach/Departure Control is perhaps the most complex of all the control positions on VATSIM. It is the first one dealing primarily with the control and separation of IFR aircraft. In most countries, this is referred to as Terminal Area Control. Thailand refers to these areas as "TMA's" Terminal Management Areas. While every airport varies, terminal controllers usually handle traffic in a 30 to 50 nautical mile (56 to 93 km) radius from the airport and from the surface up to 11,000 (16000 in Bangkok) feet. The actual airspace boundaries and altitudes assigned to a TMA are based on factors such as traffic flows and terrain, and vary widely from airport to airport. Thailand TMA's are identified by the solid green lines on the sector file.

1-2. TMA controllers are responsible for providing all ATC services within their airspace. Traffic flow is broadly divided into departures, arrivals, over flights, and VFR aircraft. As aircraft move in and out of the TMA airspace, they are handed off to the next appropriate control facility (a control tower, an en-route control facility, or a bordering TMA control). The approach controller is responsible for ensuring that aircraft are at an appropriate altitude when they are handed off, and that aircraft arrive at a slow enough rate to permit safe landing times.

1-3 In Ground Control and Tower, your primary responsibility was to set an orderly sequence of arrivals and departures; most of the responsibility for avoiding collisions with other aircraft and navigation was on the pilot. Now in addition to setting the sequence, you are responsible for separating the aircraft from each other and the terrain. You must select the routes and altitudes the pilots will fly. You must take the aircraft from the runway up into the enroute system and bring others down to a safe approach and landing. What you learn here will form the basis for much of what you do while working Center.

Chapter 2 – Airspace and Operating Positions

2-1. In real-life, all the airspace belongs to the FIR. The FIR in-turn delegates the airspace around major airports to the Approach Control. The lateral and vertical limits of each Approach Control's airspace are individually tailored. Some Approach Controls are quite large serving several busy airports while others are relatively small with only the primary airport and perhaps one or two small secondary airports. When an airport doesn't lie within an Approach Control's airspace the ARTCC provides limited approach/departure service.

2-2. Approach Control is the generic name given to the radar facility responsible for controlling IFR and, in Class C and D Airspace and VFR aircraft in the vicinity of the primary airport. Other name you may have heard is TMA Terminal Management Area. The other main sector is Departure. Depending on how busy or complex the operation is, there may be other sectors as well. Their names will vary from one facility to another. Some common sector names are Arrival, Pattern, Feeder, and Final. Additionally, sectors may be designated by the portion of the airspace they control, e.g. Bangkok East Approach, Bangkok West Approach, Bangkok Final sequence.

2-3. Regardless of the sector name, each sector is given a portion of the Approach Control's overall airspace to control. Anything going on in that airspace is the responsibility of the sector controller. The sector name may be Departure but if there is a secondary airport completely within his airspace, that controller performs the approach control function as well. This idea of only one controller responsible for each block of airspace is a cornerstone of the ATC system. That one controller knows where all his airplanes are and what he plans to do with them. He doesn't have to worry about any conflicts created by another controller working aircraft in the same airspace. On VATSIM, the need to sectorize doesn't come up often, but if it does you must coordinate with adjacent controllers and agree to the sector boundaries. Try to keep them as simple as possible to eliminate the need for excessive coordination. Each controller must keep all his aircraft within his own sector until he has completed coordination and obtained approval from the adjacent controller to enter the other controller's airspace.

Chapter 3 – Procedural Reference

3-1. There are two main methods to control IFR traffic:

1. **Radar** - used to accurately determine each aircraft's position in order to separate and sequence traffic.
2. **Non-radar** - uses time and distance to create blocks of protected airspace for each aircraft along its route.

3-2. In real-life, both methods are normally used together according to the situation and equipment limitations. Radar coverage is not always 100%. ASRC/VRC is a 100% radar environment. It's not possible for an aircraft to be connected to the VATSIM network and not show up on radar. It may only show a partial data block but it's still there.

Chapter 4 – Coordination

4-1. By this time, you should have a pretty good idea of what needs to be coordinated and what doesn't. You already know what needs to be coordinated with Tower. Some of the things you should coordinate with Center are routings for arrivals and departures, altitude restrictions, and handoff points and altitudes. If you coordinate and agree to standard procedures for these things, it will eliminate the need to coordinate for each aircraft individually.

4-2. In the Basic Study Guide, you learned about Handoffs. A Handoff is simply the transfer of responsibility for control of an aircraft from one controller to another. It included changing the aircraft to the next controller's frequency. The Approach/Departure position will be the first position you work that requires you to "TRACK" an aircraft. In the ground and tower position you did not "TRACK" aircraft. Now that you are a radar position you will now need to "TRACK" aircraft.

4-3. Another term used between two radar controllers is "POINTOUT." A pointout is a request from one controller to enter the airspace of another controller without transferring control or communications. A pointout is similar to a non-automated handoff in that you state the word "POINTOUT" the aircraft's position, callsign, and your request, e.g. "*POINTOUT 35 NORTHEAST OF ABQ UAL535 REQUEST EXTENDED DOWNWIND*."
The other controller has three options:

1. "*POINTOUT APPROVED*" which means you may enter his airspace as requested and retain control of the aircraft. He may also issue restrictions which you must obey.
2. "*RADAR CONTACT*" which means in order to enter his airspace you must handoff the aircraft to him.
3. "UNABLE" which means you may not enter his airspace at all.

There are three other terms associated with pointouts you need to know:

I. "TRAFFIC" along with an aircraft's position used by the controller approving a pointout means "Separate your pointout aircraft from this aircraft of mine while you're in my airspace."
II. "TRAFFIC OBSERVED" Used by the controller requesting the pointout means "I see your aircraft and will separate my pointout aircraft from it."
III. "YOUR CONTROL" when used by the controller approving the pointout means "Anything you want to do with that aircraft in my airspace is approved."

4-4 When you work the Approach position you must coordinate with the Center position (if online). You need to determine if the Center controller is controlling by means of Radar or Procedural control. If you and the Center controller are using Radar to separate aircraft you need only make sure that aircraft are separated by 5 miles (at same altitude-routing) or 1000 feet vertically between IFR aircraft. If you are controlling by means of Radar and the center is controlling by means of Procedural control you will need to space the aircraft out when:

a. One aircraft follows another aircraft along the same airway/routing at the same altitude.
b. Aircraft at the same altitude will cross paths.
c. Aircraft flying reciprocal paths may cross.

The center controller needs to provide 10 minute separation and 10 minute separation by Mach number to the aircraft. You as the Approach controller also need to know how to create the separation that Center needs. Refer to the Center Training Chapter 5 for this information.

4-4-1 When you are working Approach by means of Procedural control you must notify the Center controller and coordinate your arrivals. If the Center controller is using Radar to separate the aircraft, he will need to create more separation for the arrival into the TMA. The center controller may even have to put some aircraft in holds until you can create the correct amount of separation. Approach and Center will usually create good separation with the exception of aircraft on different routings. YOU NEED TO COORDINATE!!!!!!

Chapter 5 – Radar Identification and Service Termination

5-1. Real-life air traffic control consists of a mix of radar, non-radar, and visual procedures. You must inform the aircraft when it is in "radar contact" and when it isn't. On ASRC/VRC, the aircraft is always in radar contact. In real-life, there is always the possibility of misidentifying an aircraft. Using ASRC/VRC, this is impossible. Therefore, anything you do to radar identify an aircraft or inform it of "radar contact" serves no real purpose and is only to add to the feeling of realism.

5-2 . The two most common places you tell aircraft "Radar Contact or Radar Identified" are on initial contact after departure and on initial contact if the aircraft is a pop-up arrival. It is not necessary to tell the aircraft " Radar Contact or Radar Identified " if it was handed off to you by another controller (controlling with radar). The aircraft was told "radar contact" when it initially entered the ATC system and hasn't been out of radar contact since. Refer to the following situations for correct use of radar contact on ASRC/VRC:

- To tell an aircraft to turn its transponder on, use the term "*SQUAWK NORMAL*."
- To tell an aircraft to turn its transponder off, use the term "*SQUAWK STANDBY*."
- If an aircraft is on the wrong code, tell it to "*RESET TRANSPONDER, SQUAWK (correct code)*."
- If all you see is a partial data block (code and altitude) the aircraft must resend its flight plan.

5-3 . It isn't possible to lose radar contact when using ASRC/VRC so you should never have occasion to say '*RADAR CONTACT LOST*." If the target or data block disappears the aircraft has either dropped out of the VATSIM network or you need to check your altitude filters in "OPTIONS-BRITE-INFO BLOCKS." Also, You should inform a pop-up arrival of its position when you state "radar contact", e.g. "*RADAR CONTACT or RADAR IDENTIFIED 35 MILES NORTHEAST OF BKK*."

5-4. When an aircraft is leaving your airspace and there are no adjacent ATC facilities to handoff to, or when you will no longer provide ATC service, use the term "*RADAR SERVICE TERMINATED*."

Chapter 6 – Safety Alerts and Traffic Advisories

6-1. Safety Alerts

6-1-1. Safety Alerts are a first priority duty. They are just as important as separating aircraft. If you see an unsafe situation developing you must issue a safety alert. Once you have done so, it is up to the pilot to decide what to do. When he tells you he is taking action, you may stop issuing the alert. An example of when to issue a safety alert would be anytime you see an aircraft in unsafe proximity to terrain or other aircraft.
"*LOW ALTITUDE ALERT, CHECK YOUR ALTITUDE IMMEDIATELY. THE MINIMUM SAFE ALTITUDE IN YOUR AREA IS 3,000*."
"*TRAFFIC ALERT, ADVISE YOU TURN LEFT/RIGHT/CLIMB/DESCEND IMMEDIATELY*."

6-2. Traffic Advisories

6-2-1. Traffic advisories can serve as a useful tool to organize your traffic flow and help the pilots help you. Issue traffic advisories to all IFR and VFR aircraft unless the aircraft is in Class A airspace or the pilot tells you he doesn't want them. You should also issue traffic advisories any time it looks like the separation may decrease below the minimum required. This does not mean you may substitute traffic advisories for positive separation. If no separation is required (e.g. two VFR aircraft in class C or D airspace) issue traffic when you deem necessary. Do not forget that you must also provide traffic advisories to all aircraft at or above 10,000 feet and to turbojet at any altitude if the targets look like they will touch unless they are separated by more than 1000 feet vertically.
6-2-2. A radar traffic advisory consists of four (4) items:

1. Direction in terms of the 12-hour clock or cardinal compass points (N, S, E, W, etc.)
2. Distance in miles.
3. Direction of movement (north, south, crossing, converging, etc.).
4. Type aircraft and altitude, if known.

6-2-3. Here are some phraseology examples you can use:
"*TRAFFIC, 12 O'CLOCK, 15 MILES, OPPOSITE DIRECTION, ALTITUDE UNKNOWN*."
"*TRAFFIC, 10 O'CLOCK, 12 MILES, CROSSING LEFT TO RIGHT, 1,000 BELOW YOU*."
"*TRAFFIC, NORTHEAST OF YOU, 10 MILES, SOUTHBOUND, DC-8, 17,000*."
"*TRAFFIC, 10 O'CLOCK, 5 MILES, SOUTHBOUND, A B737, AT SEVEN THOUSAND.*

6-2-4. You may also use non-radar traffic advisories if more appropriate. These consist of four (4) items as well:

1. Distance and direction from a fix.
2. Direction the traffic is moving.
3. Type aircraft and altitude, if known.
4. ETA over the fix, if appropriate.

6-2-5. Here are a few phraseology examples using non-radar advisories:
"*TRAFFIC, 10 MILES EAST OF VXV, SOUTHBOUND, MD-80, DESCENDING TO 16,000*."
"*TRAFFIC, 10 MILES WEST OF DBQ, NORTHBOUND, ALTITUDE UNKNOWN*."
"*TRAFFIC, 8 WEST OF CHS, WESTBOUND, 747 AT 8,000, ESTIMATING SAV at 2035*."
"*TRAFFIC, NUMEROUS AIRCRAFT, VICINITY OF Tak AIRPORT*."

Chapter 7 – Vertical Separation and Altitude Assignment

7-1. The minimum vertical separation used by Approach Control is 1,000 feet. Other standards are used at higher altitudes and are covered in the Center Study Guide. Altitudes assigned to arrivals and departures by Approach Control are based on traffic and terrain. Many DPs and STARs have minimum altitudes in them. Airways also have Minimum Enroute Altitudes and Minimum Obstruction Clearance Altitudes.

Any other altitude you assign must be at or above the Minimum Vectoring Altitude. The Minimum Vectoring Altitude is an altitude which is 1000 feet above the highest terrain or obstacle in a given area. Unfortunately, MVAs are not readily available for most airports in VATTHD. You must use your best judgment based on information derived from real-world charts and Flight Sim experience. We recommend that you use the MSA (Minimum Safe Altitude) altitudes that are printed on IAP charts when off route vectoring is being conducted. Some IAPs charts show the high terrain areas on the chart. Additional Vertical separation information can be found in ICAO Doc 4444 Chapter 5.3.

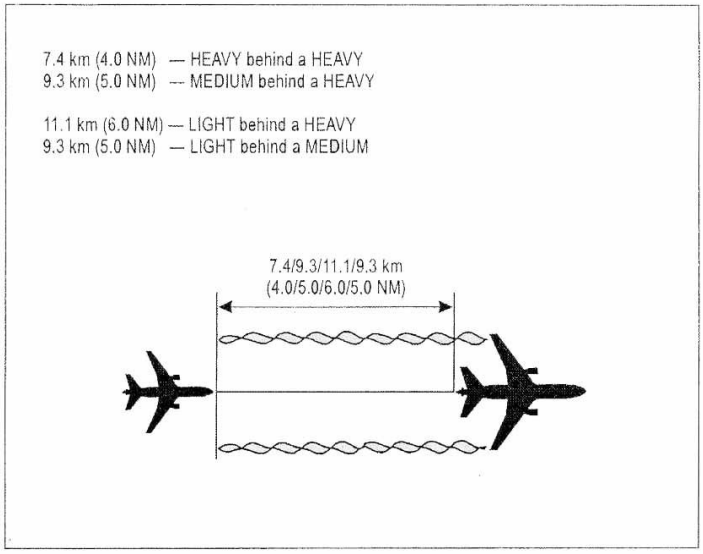
Chapter 8 – Radar Separation In The TMA

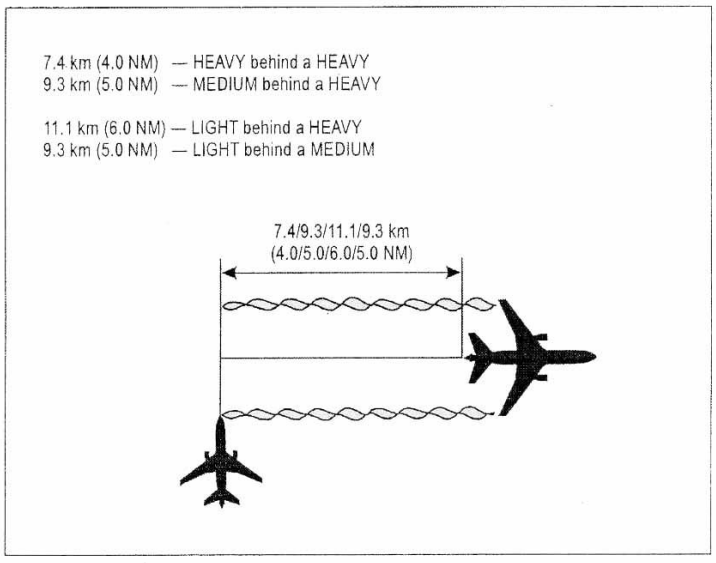
8-1 The minimum radar separations between non-heavy aircraft of the same weight class are:

- When less than 40 NM from the center of the ASRC/VRC display - 3 NM
- When 40 NM or more from the center of the ASRC/VRC display - 5 NM
- 2.5 NM between succeeding aircraft which are established on the same final approach track within 10 NM of the runway end when dissimilar weight classes are NOT involved. (refer to ICAO Doc 4444 8.7.3.2 b) for additional).

8-2. When Heavy or dissimilar weight classes are involved:

- Heavy behind Heavy - 4 NM.
- Medium behind a Heavy - 5 NM.
- Light behind a Heavy - 6 NM.
- Light behind a Medium - 5 NM





8-3. When an aircraft will land behind another aircraft on the same runway or parallel runway separated by less than 2500 ft (760 meters):

- Heavy behind Heavy - 4 NM.
- Medium behind a Heavy - 5 NM.
- Light behind a Heavy - 6 NM.
- Light behind a Medium - 5 NM
- Between aircraft departing from the same airport when initial headings differ by 15 degrees or more - 1 NM.
- Between a departure and an arrival - 2 NM if the separation will increase to 3 NM (5 NM if 40 NM or more from the center of the ASRC/VRC display) within 1 minute.

8-4. Under some conditions you may conduct simultaneous operations between arrivals, departures, and arrivals and departures. These conditions are very complex and require specific distances between runways and landing thresholds. Refer to ICAO Doc 4444 Chapter 6 to see if your airport meets these conditions.
Visual separation is another option but on VATSIM this can be a bit of a problem. Unless the aircraft are all connected using SquawkBox's/FSINN's Multi-Player feature and have their multi-player visibility set high enough the aircraft can't actually see each other. The next best thing is to use the TCAS function of the SB/FSINN FMS although not all pilots are proficient at reading the display. If one aircraft reports the other in sight tell it to "*MAINTAIN VISUAL SEPARATION FROM THAT TRAFFIC*." If the two aircraft are on crossing courses tell the other aircraft visual separation is being used, e.g. "*TRAFFIC HAS YOU IN SIGHT AND WILL MAINTAIN VISUAL SEPARATION*."
8-5 Except when transfer of control is to be effected, aircraft shall not be vectored closer than 2.5 NM (4.6 km) or, where the minimum permissible separation is greater than 5 NM (9.3 km), a distance equivalent to one-half of the prescribed separation minimum, from the limit of the airspace for which the controller is responsible, unless local arrangements have been made to ensure that separation will exist with aircraft in adjoining areas.

8-6. Basic Phraseology (Complete list of Phraseology can be found in ICAO Document 4444 chapter 12.3)

Aircraft received by Radar Approach with Center providing radar services with vectors:
THA795, Chiang Mai Approach, Sa-wat-dee kraup expect vectoring for ILS 36 Approach, Chiang Mai QNH 1013.

Aircraft received by Radar Approach position from Center providing procedural services with vectors:
THA795, Chiang Mai Approach, Sa-wat-dee kraup, Identified, 25 miles south east of CMA VOR, expect vectoring for ILS 36 Approach, Chiang Mai QNH 1013.

Aircraft received by Procedural Approach position from Center. With no approach the aircraft will need to fly the full procedure.
Full Procedure Approach:
THA795, Chiang Mai Approach, Sa-wat-dee kraup , expect the full procedure ILS 36 Approach, Chiang Mai QNH 1013.

Common Instructions:
THA795, Turn Right heading two-seven-zero
THA795, Climb to seven-thousand
THA795, Maintain seven-thousand (used to have the pilot hold the altitude when climbing or descending)
THA795, Climb to Flight Level one-three thousand
THA795, Descend to seven-thousand
THA795, Fly heading two-seven-zero
THA795, Reduce speed Two-one-zero knots
THA795, When ready, descend to cross (fix) at (altitude).
THA795, When ready, descend to (altitude)

Intercepting the Localizer:
THA795, turn right heading three-three-zero, join the runway 36 localizer, report established. FAA way
THA795, you are ten miles from [airport/OM/FAF] maintain three thousand until established cleared ILS 36 Approach. FAA way
THA795, turn right heading three-three-zero, cleared ILS approach runway (xxx). Report established. THAI way

Initial Contact with departures:
THA795, Chiang Mai Approach/Departure, Sa-wat-dee kraup , Radar identified [turn right/left heading (xx)], climb to (xx).

Chapter 9 – Non-Radar Separation In The TMA

9-1. Terminal Control Areas (TMA) that do not have radar coverage shall be controlled using the Timed separation (Procedural Controlling) method of controlling.

9-2 We must separate aircraft longitudinally, laterally and vertically.

9-3 In Thailand all Commercial airports have a "Local controller" (Tower & Ground Control). With that in mind all of the Thailand Commercial airports operating as non-radar airports the procedural approach may be combined with aerodrome control, thus providing a control service for all aircraft at the airport, and all in and outbound flights within its terminal airspace. As most aircraft will be flying to/or from the same point within this airspace (i.e. the airport), procedural controllers use a variety of separation standards to achieve a safe and expeditious flow of air traffic to and/or from the airport. One commonly used separation in these locations is track separation, which states that two aircraft on different tracks to/from a navigational aid will be separated from each other provided at least one is a minimum distance from the Navaid.

9-3. Controllers choosing to control by means of procedural control must:
- a. Have the ability to determine the position of aircraft based on position reporting. (Remember you not looking at aircraft on the Radar scope)
- b. Have the ability to coordinate with the Tower and Center on all Arrivals and Departures.
- c. Have the ability to communicate with pilots to determine their positions based on pilot reports and to issue hold, approach and crossing time instructions.
- d. Have superior knowledge of the airspace, like the location of Navaids, high terrain, holding points.
- e. Have superior knowledge of all available instrument approaches available for that airport or the ability to obtain those charts.
- f. Have excellent working knowledge of procedural controlling techniques to provide the proper separation of aircraft.
- g. Notify the Tower and Center controller that the approach position is controlling via procedural control and make the appropriate coordination.
- h. Coordinate the release of departures with the tower. The tower has different rules to follow when Approach/Center are operating as procedural control positions.

9-4. Rules of procedural control In VMC
1. In VMC (Visual Meteorological Conditions), a aircraft may be cleared to execute a visual approach provided a pilot can maintain visual reference to terrain and:
   a. The reported ceiling is at or above the approved initial approach level for the aircraft so cleared.

b. The pilot reports at the initial approach level or at any time during the instrument approach procedure that the meteorological conditions are such that with reasonable assurance a visual approach and landing can be completed.
   i. At any point during the approach the pilots reports loss of VMC, the controller will Issue the pilot a climb to the MSA and have the pilot fly to the appropriate fix to fly a full procedure approach.
   ii. Once the pilot has the airport insight you will hand him off to the tower controller. Note you should be coordinating arrivals and departures with tower at all times.

2. Separation shall be provided between an aircraft cleared to execute a visual approach and other arriving and departing aircraft.
3. For successive visual approaches, separation shall be maintained by the controller until the pilot of a succeeding aircraft reports having the proceeding aircraft in sight. The Aircraft shall then be instructed to follow and maintain own separation from the preceding aircraft. The required Interval between successive approaches is:
   a. 2 minute separation shall be provided to a Medium aircraft following a Heavy aircraft.
   b. 3 minutes separation shall be provided to a Light aircraft following a Medium or Heavy aircraft. (This would apply to an aircraft following on the same exact procedure or if using two different procedures 2 or 3 minutes between aircraft crossing the OM/FAF.)
4. Departures into VMC will be given a heading and initial altitude by the tower to avoid terrain. Once handed Off, the departure controller can issue a clearance to the first navaid/fix and climbing instructions and advise the aircraft to maintain visual separation from terrain.

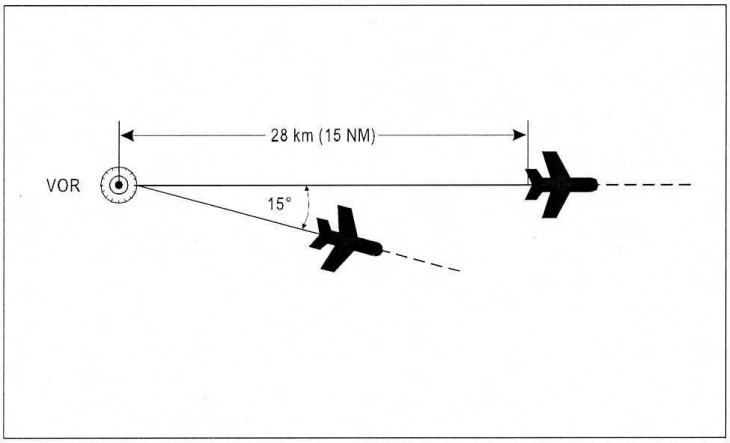
9-5. Rules of procedural control in IMC

1. The approach control unit shall specify the instrument approach procedure to be used by arriving aircraft. A flight crew may request an alternative procedure and, if circumstances permit, should be cleared accordingly.
2. If visual reference to terrain is established before completion of the approach procedure, the entire procedure must nevertheless be executed unless the aircraft requests and is cleared for a visual approach.
3. Timed Approach Procedures shall be used to sequence and space aircraft on instrument approaches.
   a. A suitable point on the approach path, which shall be capable of being accurately determined (VOR, FIX, DME FIX) by the pilot, shall be specified, to serve as a checkpoint in timing successive approaches.
   b. Aircraft shall be given a time at which to pass the specified point inbound, which time shall be determined with the aim of achieving the desired interval between successive landings on the runway while respecting the applicable separation minima at all times, including the period of runway occupancy.
      i. A minimum of 2 minute separation shall be provided to a Medium aircraft following a Heavy aircraft.
      ii. A minimum of 3 minute separation shall be provided to a Light aircraft following a Medium or Heavy aircraft.
   c. The time at which aircraft should pass the specified point shall be determined by the unit providing approach control services and notified to the aircraft sufficiently in advance to permit the pilot to arrange the flight path accordingly.
   d. Each the aircraft in the approach sequence shall be cleared to pass the specified point inbound at the previously notified time, or any revision thereof, after the preceding aircraft has reported passing the point inbound.
4. Interval between successive approaches: In determining the time interval or longitudinal distance to be applied between successive approaching aircraft, the relative speeds between succeeding aircraft, the distance from a specified point to the runway, the need to apply wake turbulence separation, runway occupancy times, the prevailing meteorological conditions as well as any condition which may affect runway occupancy times shall be considered. Local instructions shall additionally specify the circumstances under which any increase longitudinal distance between approaches may be required as well as minima to be used under such circumstances.

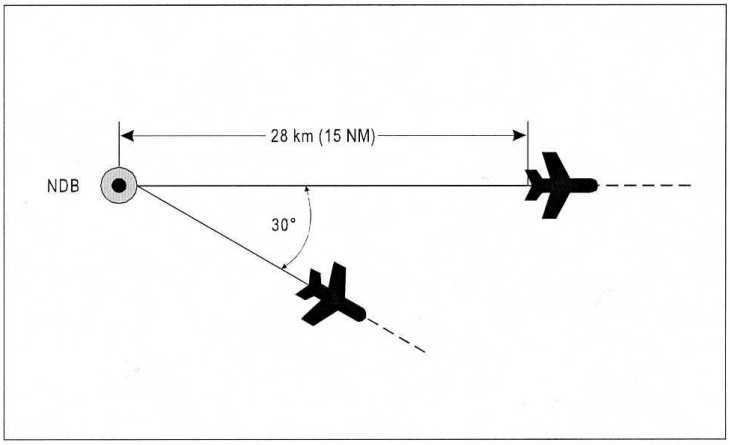
5. If longitudinal and or lateral separation do not exist than aircraft must be separated vertically by 1000 feet between IFR aircraft.

6. If vertical separation does not exist then we must separate aircraft longitudinally and latterly. Means by which lateral separation may be applied. When using the same navigation aid or method. By requiring aircraft to fly on specific tracks which are separated by the minimum amount appropriate to the navigation aid or method employed as follows:

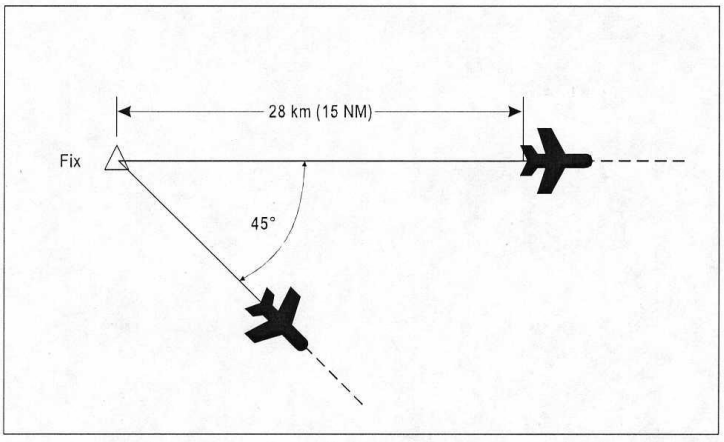
   a. VOR: at least 15 degrees and at a distance of 15 NM or more from the facility.



   b. NDB: at least 30 degrees and at a distance of 15 NM or more from the facility.



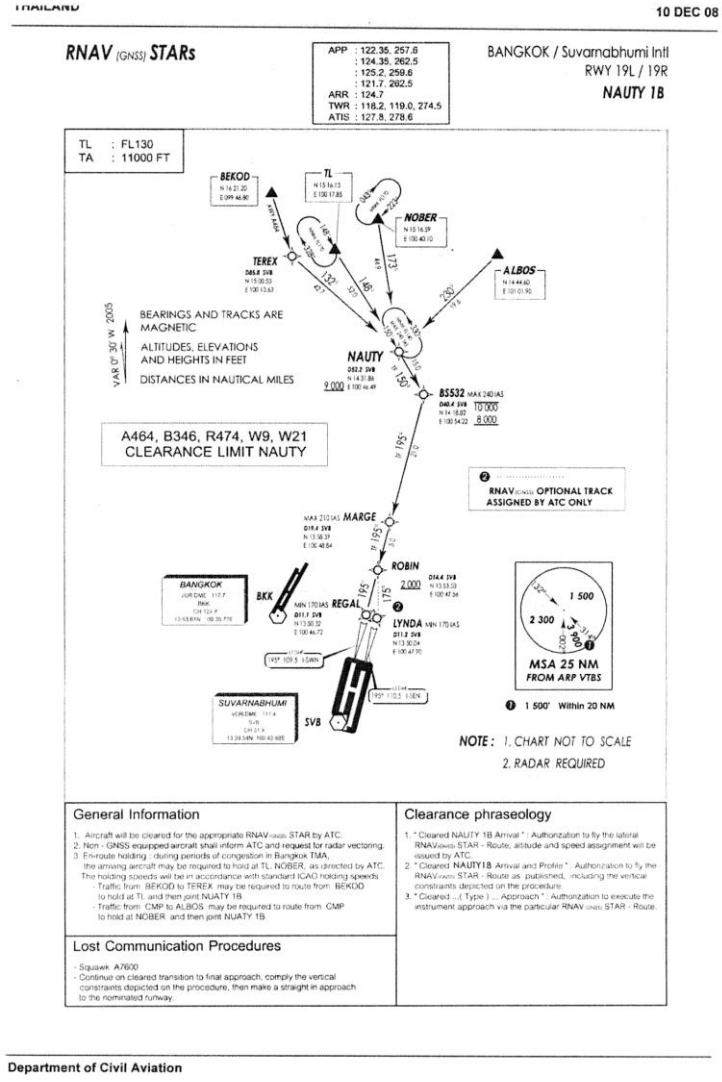
   c. Dead Reckoning: aircraft established on tracks diverging by at least 45 degrees and is at a distance of 15 NM or more from the point of intersection of the tracks.



Chapter 10 – Standard Instrument Arrival (STAR)

10-1. STAR (Standard Instrument Arriva): A standard instrument arrival route or STAR usually covers the phase of a flight that lies between the top of descent from cruise or en-route flight and the final approach to a runway for landing.
Normally that final approach starts at the so-called Initial approach Fix (IAF).
A typical STAR consists of a set of starting points, called transitions, and a description of routes (typically via waypoints) from each of these transitions to a point close to the destination airport.
There the aircraft can join an instrument approach (IAP) or will be vectored for a final approach by the APP control.
It should be noted that not all airports have published STARs. However, most relatively large or not easily accessible (for example, in the mountainous area) airports do. Sometimes several airports in the same area share a single STAR; in such case, aircraft destined for any of the airports in such group follow the same arrival route up until reaching the final waypoint, after which they join approaches for their respective destination airports.
Not all STARs are for IFR flights. Occasionally STARs are published for visual approaches, in which case they use specific visible landmarks on the ground and other visual reference points instead of waypoints or radio navigation aids.
STARs can be very detailed (as is often the case in Europe), allowing pilots to go from descent to approach entirely on their own once ATC has cleared them for the arrival, or they can be more general (as is often the case in the United States), providing guidance to the pilot which is then supplemented by instructions from ATC.

Example: RNAV Arrival to Suvarnabhumi Intl



10-2. Most of the STARS into the Bangkok TMA originate outside the Approach controllers control area. The Center controller will usually give the initial clearance to fly the Arrival. The Approach controller will give instructions to proceed on course with the Arrival, Issue the QNH, issue published and unpublished altitude restrictions, issue traffic alerts, advise the runway (if center has not) and type of approach to expect and provide vectors to the localizer/final approach course.

10-3. Phraseology (Complete list of Phraseology can be found in ICAO Document 4444 chapter 12.3)

Authorization to fly the lateral RNAV STAR – Route; Altitude and speed assignment will be issued by ATC:
THA795, Bangkok Approach, Cleared NAUTY 1B Arrival, Runway 19R, Suvarnabhumi QNH 1013.
OR
THA795, Bangkok Approach, Cleared direct NAUTY, NAUTY 1B Arrival, Runway 19R, Suvarnabhumi QNH 1013.

Authorization to fly the lateral RNAV STAR – Route as published, including the vertical constraints depicted on the procedure.
THA795, Bangkok Approach, Cleared NAUTY 1B Arrival and Profile, Suvarnabhumi QNH 1013.

Chapter 11 – Standard Instrument Departure (SID)

11-1. A SID is an air traffic control coded departure procedure that has been established at certain airports to simplify clearance delivery procedures. SIDs are supposed to be easy to understand and if possible limited to one page. Although a SID will keep aircraft away from terrain, it is optimized for ATC route of flight and will not always provide the lowest climb gradient, but strike a balance between obstacle avoidance and airspace considerations.

11-2. There are three types of SID's: RNAV, Pilot Nav, Vectored Departures.

a. RNAV SID: This type of SID allows the pilot to depart the TMA with little or no instructions from ATC. Pilots must be able to navigate with use of GPS or a FMC to use this type of Departure.

b. Pilot Nav SID: This type of SID allows the pilot to depart the TMA with little or no instructions from ATC. Pilots need to be able to navigate by VOR's to fly these departures.

c. Vectored SID: This type of departure required the controller to issue altitude changes and heading to a Specific gate (Exit point). Pilots need to be able to navigate by VOR's to fly these departures

11-3. The controller issuing departure clearances from the Aerodrome is responsible for issuing the correct SID . Once the pilot has been issued the SID, it is his responsibility to fly the SID once airborne.

11-4. When the aircraft is handed off to the Approach/Departure controller , he/she will issue a climb altitude and traffic information if needed. The controller does not need to tell the pilot to continue with the departure or anything of that nature. You only need to issue instruction if you are taking the aircraft off of the SID for vectoring or clearing direct to a point on the SID or on the flight plan.

1-5. Example of RNAV Departure

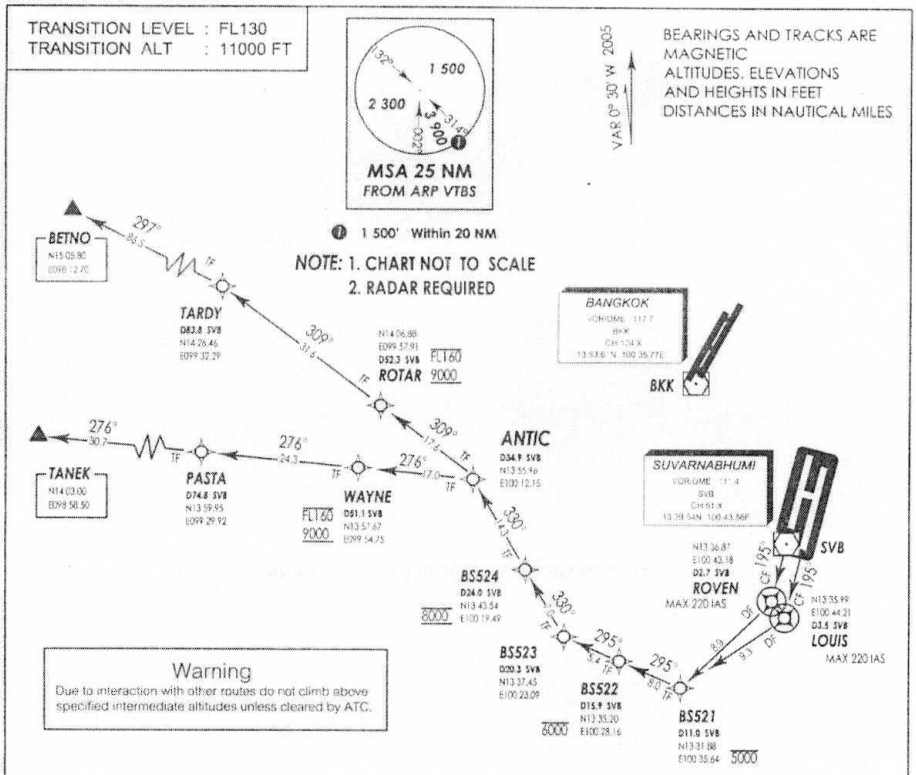
RNAV (GNSS) SIDs

BANGKOK / Suvarnabhumi Intl
RWY 19L / 19R

APP	: 122.35 , 257.6
	: 124.35 , 262.5
	: 125.2 , 259.6
TWR	: 118.2 , 119.0, 274.5
ATIS	: 127.8 , 278.6

RUNWAY 19L - ANTIC 1C
RUNWAY 19R - ANTIC 1B

TRANSITION LEVEL : FL130
TRANSITION ALT : 11000 FT



General Information

1. After departure immediately contact Bangkok Approach on 125.2 MHz.
2. Non - GNSS equipped aircraft shall inform ATC and request for radar vectoring.
3. En-route cruising level will be issued by " Bangkok Control ". Do not climb above RNAV SID levels until instructed by ATC.
4. Maximum IAS 250 kt. below 10000 ft. Unless otherwise authorized.

Lost Communication Procedures

- Squawk A7600
- Comply with last assigned level to ANTIC then continue on ANTIC 1B / ANTIC 1C departure until next compulsory reporting point then climb to flight plan cruising level.

Climb Instruction

These SIDs are also minimum noise routing and require a minimum climb gradient of 304' per NM (5.0%) until passing altitude 3000 ft.

GS (KT)	75	100	150	200	250	300
304' per NM	380	507	760	1014	1267	1520

Abbreviated Description: Take-off RWY 19R ANTIC 1B :

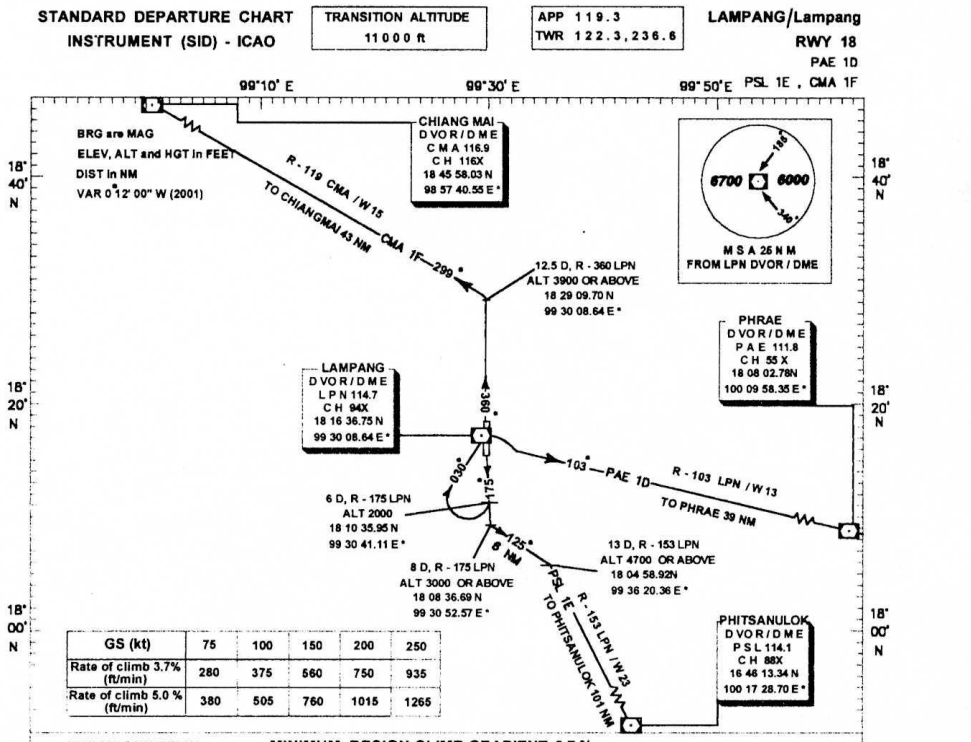
RWY19R(DER) - ROVEN[M195;K220-;R] → BS521[A5000-;R] - BS522[A6000-] - BS523[R] - BS524[A8000] - ANTIC

Abbreviated Description: Take-off RWY 19L ANTIC 1C :

RWY19L(DER) - LOUIS[M195;K220-;R] → BS521[A5000-;R] - BS522[A6000-] - BS523[R] - BS524[A8000] - ANTIC

Transition	Routing	Airways
TANEK	ANTIC[L] - WAYNE[A9000+;FL160-] - PASTA - TANEK	R468
BETNO	ANTIC[L] - ROTAR[A9000+;FL160-] - TARDY[L] - BETNO	G463, P646

11-6. Example of a Pilot Nav SID



11-7. Phraseology (Complete list of Phraseology can be found in ICAO Document 4444 chapter 12.3)

Initial contact providing radar services and allowing aircraft to fly the SID and follow the Profile (altitude restrictions) to cruise altitude.
THA795, Bangkok Approach, Sa-wat-dee kraup , Radar identified, Climb to flight level (xx).
As long as the pilot was issued the SID he should know to fly it after departure.

Initial contact providing radar services and allowing aircraft to fly the SID canceling the profile.
THA795, Bangkok Approach, Sa-wat-dee kraup , Radar identified, Climb to flight level (xx). Profile restrictions lifted.

Initial contact providing Procedural services (Non-Radar).
THA795, Lampang Approach/Departure, Sa-wat-dee kraup , climb to (xx), report [(established airway), (crossing xx), (climbing through xx)]

Initial contact , no SID providing Radar services.
THA795, Lampang Approach/Departure, Sa-wat-dee kraup , Radar Identified. Climb to (xx), turn (right/left) heading (xx).

Chapter 12 – Holding

12-1. Holding is like airborne parking. The aircraft is flown in a racetrack pattern, around and around, until there is space in the system for the aircraft to move on to the next segment of the flight.

12-2. There are several reasons why we hold aircraft:
- a. Create spacing of en-route aircraft.
- b. Create spacing between arriving aircraft into a TMA using procedural control.
- c. Create spacing of aircraft departing and transitioning to the en-route phase of flight.
- d. A hold may be issued when weather at the arriving airport is below IFR minimums.

12-3. Detailed information on holding is contained in the Thailand Division Hold Training module. Real world Thailand holding information is available in Thailand AIP ENR 1.5

Chapter 13 – Speed Control

13-1. Controllers must conform to ICAO speed restrictions for descending and arriving aircraft.

13-2. Speed adjustments should be expressed in multiples of 10 knots based on indicated air speed (IAS).

13-3. Aircraft flying below 10,000 must fly at speeds of 250 knots IAS or less. Speeds greater than 250 knots may be granted upon request only.

13-4. Speed reductions to less than 250 knots IAS for turbojet aircraft during initial descent from cruise level should be applied only with concurrence of the flight crew.

13-5. Instructions for an aircraft to simultaneously maintain a high rate of descent and reduce its speed should be avoided.

13-6. Arriving aircraft should be permitted to operate in a clean configuration for as long as possible. Below FL150, speed restrictions for turbo jet aircraft to not less than 220 knots IAS, which will normally be very close to the minimum speed of a turbojet aircraft in a clean configuration, may be used.

13-7. Only minor speed restrictions not exceeding plus/minus 20 knots IAS should be used for aircraft on intermediate and final approach.

13-8. Speed control should not be applied to aircraft after passing a point 4 NM from the threshold on final.

13-9. Remember controllers will see the aircraft's ground speed on the scope. Not Indicated or true air speed.

Written by John Holt
Training updated by John Holt 3-11-11