

Approach / Departure S3 Training Handbook

Integrated Training for vACC SRM Controllers and Pilots

Refer SRM [Radiotelephony Communications Handbook](#) for supporting details



virtual Air-traffic Control Center
Sri Lanka & Maldives

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Note: Information appear in this document extracted from data available in WWW
For simulated flight and controller use only

1 INTRODUCTION

Approach and Departure control is an air traffic function provided by air traffic control facilities in Class B and C airspaces. It separates all international and domestic traffic, including large and small aircraft.

Approach (APP) controller has the responsibility of ensuring ATC services to arriving and departing aircraft within the airspace around SRM International airports.

The controlled zone is called the TMA (Terminal Control Area). It extends from a base altitude, always higher than the surface, to a ceiling flight level. All TMA boundaries are published on charts.

Traffic within the TMA airspace is composed by:

- Departure flights, in climb phase
- Arrival aircraft, in descent phase to runway, Initial Approach Fix (IAF)
- Flights in transit, crossing TMA airspace at a constant level altitude (FL or feet)

The control within S3 area is further identified Arrival controller (APP) & Departure controller (DEP)

1.1 Departure Control

The departure controller follows and track the movement of aircraft in the assigned sector. As an aircraft reaches an altitude of roughly 1500 feet, the DEP controller takes over responsibility for that aircraft from Tower control. The departure controller will then ensure the aircraft maintains a safe distance from other aircraft while departing. Once the aircraft flies out of DEP airspace, the departure controller ensures the flight is then passed onto a CTR controller or Unicom.

1.2 Approach Control

Approach controllers are located in the same area as departure controllers and handle the same responsibilities but in reverse. When an aircraft enters the controller's area of responsibility, they resume control of the aircraft to ensure it approaches the incoming airport and lands safely.

The APP/DEP controller has to ensure the traffic management for IFR and VFR, and responsible and control following:

- Separation of all IFR, VFR traffic according to the airspace class in class A, B, C, D or E airspaces
- IFR and VFR arrival routes inside TMA airspace (Usually with 75nm radius of any SRM international airport)
- IFR & VFR departure routes inside TMA airspace
- IFR & VFR transit routes inside TMA airspace
- Provide STAR/SID routing as required
- Provide the final approach clearance together with the landing runway (not landing clearance if Tower is present)
- Issue approach clearances, radar vectors, or direct routes to adequate fix or navigation aid to IFR flights
- Provide radar vectoring when required to maintain separation in heavy traffic situations
- Provide Flight Information Services (FIS) to VFR traffic within the TMA in airspace class C, D and E
- Issue a holding clearance over published fixes for safe sequencing (Fix, Direction, Time)
- Assign altitudes and speeds (different from those published) to facilitate sequencing and separation.

Note: When DEP, TWR, GND and DEL positions are not available, the APP controller is responsible to provide such services as required.

In normal operations APP controller is NOT responsible for:

- Aircraft transiting above TMA airspace
- Aircraft flying below TMA in non-controlled zone
- Departing aircraft crossing the TMA if the DEP controller is present
- Take-offs and landings if the TWR controller is present

The minimal vertical separation within the terminal control area (TMA) is 1000ft over the whole approach procedure.

The minimal horizontal separation within the terminal control area is:

- 5 NM
- 3 NM when reduced approach separation is applicable to the TMA area. [Note: Avoid Light behind Heavy]
- 2.5 NM when reduced approach separation is applicable on final approach track of the airfield. [Note: Avoid Light behind Heavy]

2 Standard Terminal Arrival Routes [STAR]

STAR is a pre-planned route which connects the En Route (airway, navaids) to terminal area of an airport. Some airports do not have STAR.

There are two different types of RNAV (Area Navigation) STARs.

Opened RNAV STAR: is set up that the flight flies a continuous lateral route to the DTW point (Downwind Termination Way point) followed by a heading issued by ATC. ATC is then responsible to get the flight established towards the final approach course.

Closed RNAV STAR: it is also defined as a continuous lateral route, but this procedure will take the flight right to the FACF (Final Approach Course Fix) point where the pilot will intercept the localizer/final approach for the selected runway.

2.1 Missed Approach:

Vector the aircraft again for approach (or) ask to enter left/right downwind to base, vector for final approach, (or) ask to follow published missed approach procedure if there is any.

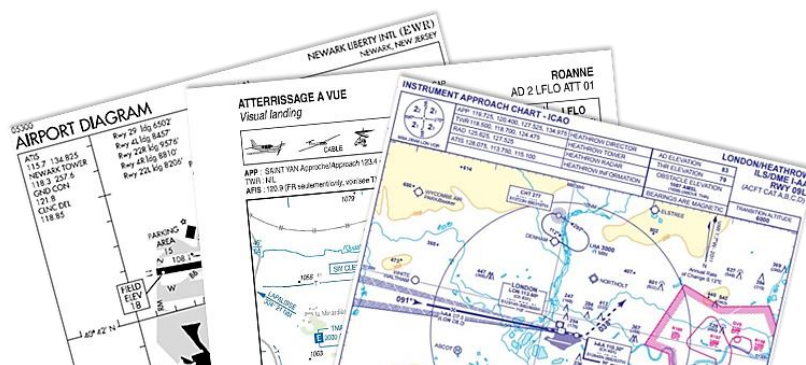
2.2 Approach clearance Phraseology:

Aircraft (DISTANCE) miles from (FIX), turn left/right heading (NUMBER), cleared (TYPE OF APPROACH) runway (xx) approach, maintain (MINIMUM ALTITUDE) until glide path interception

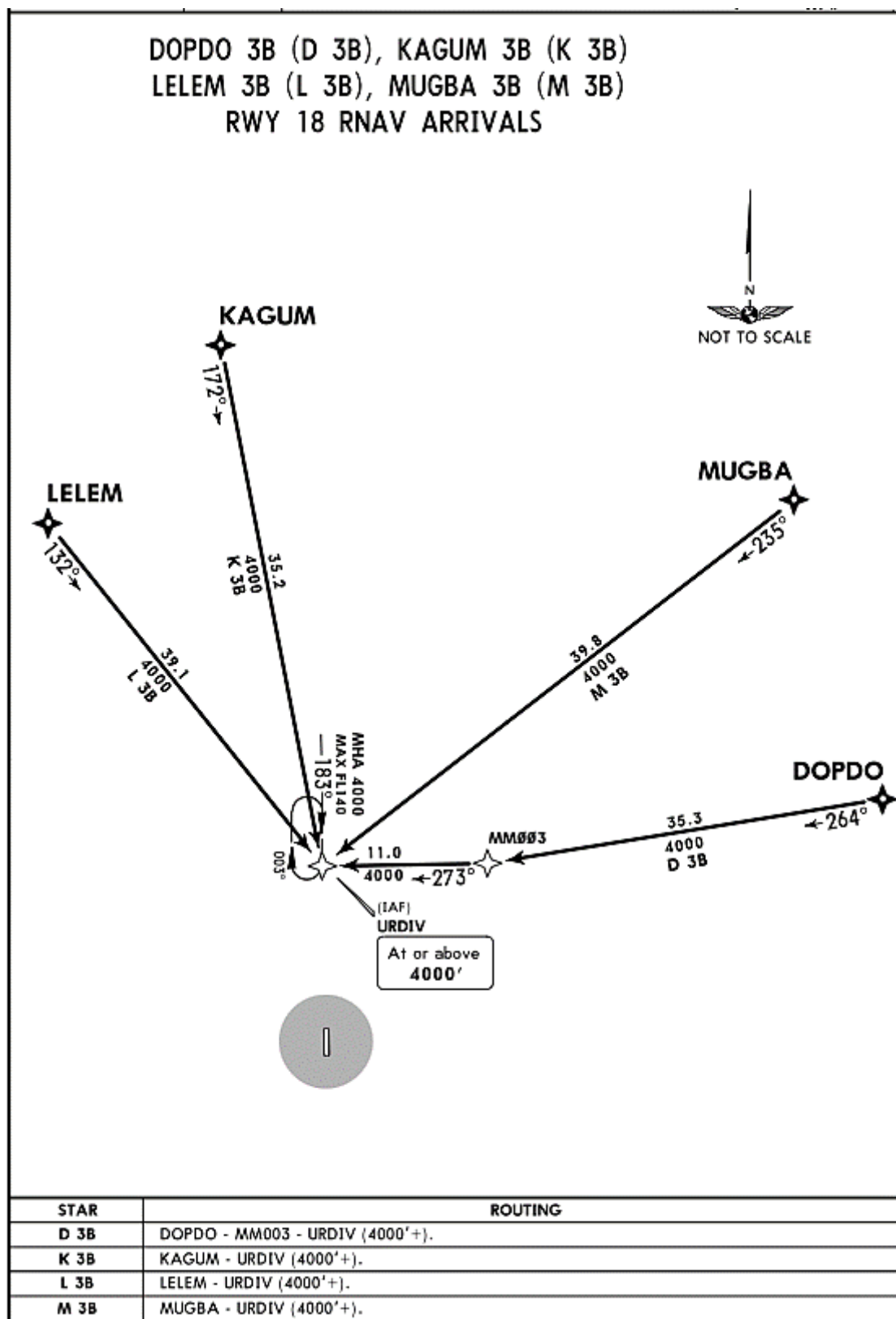
Ex: IGO359 17 miles from touchdown, turn left HDG 300, cleared to ILS approach runway 22, maintain 2000ft until glide path interception.

When the aircraft establish on LOC, hand off the aircraft to TWR.

Ex: AI001 contact Colombo TWR on 118.70



2.3 EXAMPLE OF STAR - VRMM



3 Clearances on a STAR

PHRASEOLOGY	AIRCRAFT REQUIREMENT	EXAMPLES:
DESCEND VIA STAR TO (level):	(i) descend to the cleared level and comply with published level restrictions; (ii) follow the lateral profile of the STAR; and (iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.	ALK102 descend via LALUM 1A to FL130
DESCEND VIA STAR TO (level), CANCEL LEVEL RESTRICTION(S):	(i) descend to the cleared level; published level restrictions are cancelled; (ii) follow the lateral profile of the STAR; and (iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.	ALK102 descend via LALUM 1A to FL110, cancel level restrictions
DESCEND VIA STAR TO (level), CANCEL LEVEL RESTRICTION(S) AT (point(s)):	(i) descend to the cleared level; published level restriction(s) at the specified point(s) are cancelled; (ii) follow the lateral profile of the STAR; and (iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.	ALK102 descend via LALUM 1A to FL130, cancel level restrictions at BI454
DESCEND VIA STAR TO (level), CANCEL SPEED RESTRICTION(S):	(i) descend to the cleared level and comply with published level restrictions; (ii) follow the lateral profile of the STAR; and (iii) published speed restrictions and ATC-issued speed control instructions are cancelled.	ALK102 descend via LALUM 1A to FL130, cancel speed restrictions
DESCEND VIA STAR TO (level), CANCEL SPEED RESTRICTION(S) AT (point(s)):	(i) descend to the cleared level and comply with published level restrictions; (ii) follow the lateral profile of the STAR; and (iii) published speed restrictions are cancelled at the specified point(s).	ALK102 descend via LALUM 1A to FL130, cancel speed restrictions at BI454
DESCEND UNRESTRICTED TO (level) or DESCEND TO (level), CANCEL LEVEL AND SPEED RESTRICTION(S):	(i) descend to the cleared level; published level restrictions are cancelled; (ii) follow the lateral profile of the STAR; and (iii) published speed restrictions and ATC-issued speed control instructions are cancelled.	ALK102 descend unrestricted to FL130, cancel level & speed restrictions

4 Separation Application

4.1 The separation minima specified below shall only be applied between identified aircraft when there is reasonable assurance that identification will be maintained.

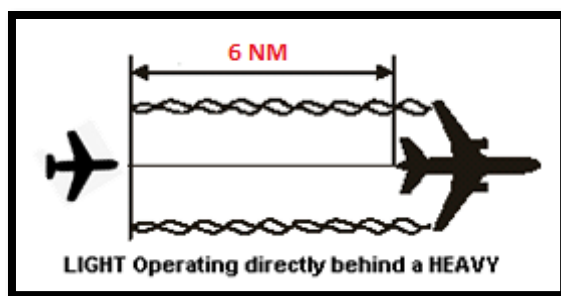
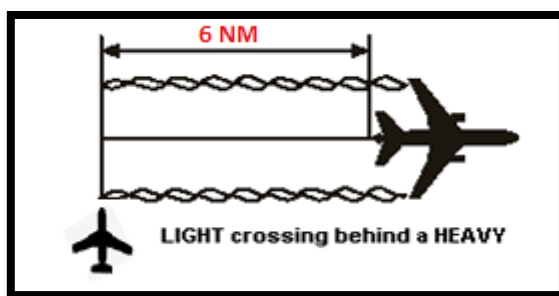
4.2 Separation minima specified below shall not be applied between aircraft holding over the same holding fix.

4.3 The following horizontal radar separation minima shall be applied:

1) 5 NM horizontal radar separations up to 60 NM, except 6 NM horizontal radar separations to aircraft in the approach and departure phases of flight shall be applied when;

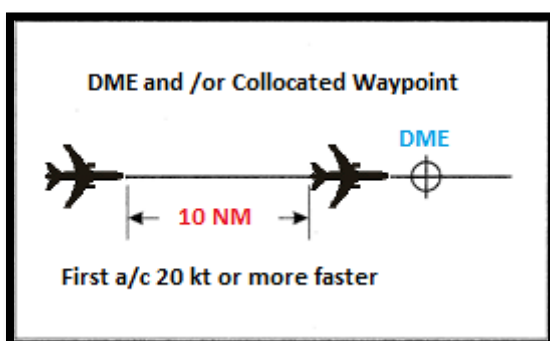
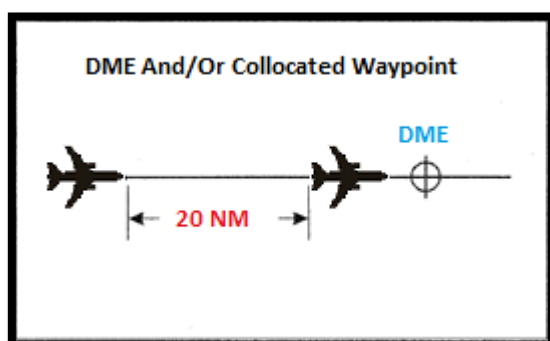
- LIGHT aircraft is operating directly behind HEAVY aircraft at the same altitude or less than 1000 ft. above/below or,
- LIGHT aircraft following HEAVY aircraft using the same runway, or parallel runways separated by less than 760 m or,
- LIGHT aircraft is crossing behind HEAVY aircraft, at the same altitude or less than 1 000 ft. above/below.

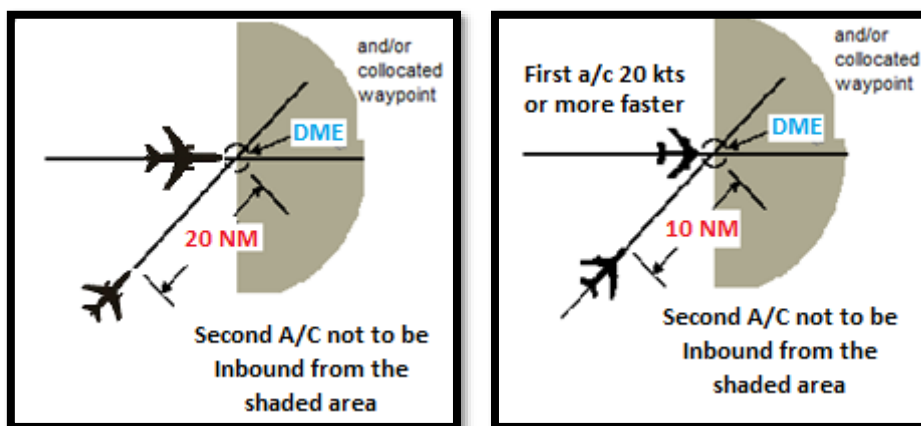
2) 10 NM horizontal radar separation beyond 60 NM.



3) Aircraft at the same cruising level on the same track, or crossing tracks space of 20 NM.

Provided if the leading aircraft maintains a true airspeed of 20 kt or faster than the succeeding aircraft space of 10 NM.

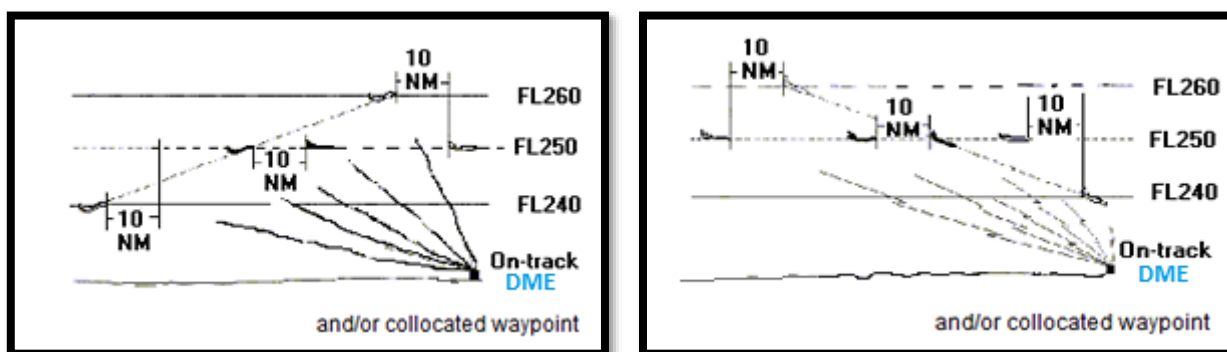




4) Aircraft climbing or descending on the same track or reciprocal tracks 10 NM, provided vertical separation does not exist.

Provided Vertical separation;

- A nominal 1000 ft. below FL290 and a nominal 2000 ft. at or above FL290, except as provided for in 'b' below; and
- A nominal 1000 feet when both aircraft are RVSM compliant and operating within designated RVSM airspace.



5) Step climb and descents

- The step climb / descent procedure may be used for simultaneous climb / descent of the aircraft to vertically separated levels provided that the lower / higher aircraft is at progressively assigned levels, which provides vertical separation with the higher / lower aircraft.
- When applying the step climb or step descent procedures, pilot must be advised that they are subject to a step climb or descent.

5 Radar Vectoring

Vectoring is provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS radar.

Vectoring is achieved by issuing the pilot specific heading which will enable the aircraft to maintain the desired track.

Ex: 'Turn left/right heading 180' or 'Fly heading 180' (pilot will select left/right turn)

Whenever a controller provides radar guidance by vectors s/he takes responsibility on all navigation parameters: heading, altitude, speed (rate of climb/descent) until the interception of the final runway approach track.

5.1 Vectoring Phraseology:

- Report heading - in case the current heading cannot be determined.
- Continue present heading - locked heading.
- Fly heading (three digits) - specifies turn in the direction that would achieve the required heading.
- Turn (left/right) heading (three digits) - specifies both the new heading and the direction of the turn.
- Turn (left/right) (number of degrees) degrees - similar to the previous, the difference being that the heading given is relative (to the present heading) rather than absolute.
- Resume own navigation, direct (point) - termination of vectoring, this instruction is used to allow the aircraft join the flight planned route.

Note: Heading instructions are given in multiples of five, e.g. 005, 035, 100, 185, 205, 260, etc. Each digit is pronounced separately (e.g. 100 is "one zero zero" and not "one hundred").

5.2 Examples of standard vectoring phraseology:

- Basic vector instruction contains heading only:
Ex: **ALK101, turn right heading 080**
- Combined vector instruction with descent instruction:
Ex: **ALK101, turn right heading 080, descent 8000ft**
- Combined vector instruction with descent instruction and speed reduction:
Ex: **ALK101, turn right heading 080, descent 8000ft, reduce speed 230 knots**
- Combined vector instruction with final approach clearance:
Ex: **ALK101, turn right heading 190, descent 1500ft, cleared ILS approach runway 22**

5.3 When vectoring an aircraft, a controller shall comply with the following:

- Whenever practicable, the aircraft shall be vectored along flight planned route.
- When an aircraft is given its initial vector diverting it from a previously assigned route, the pilot shall be informed
Ex: **ALK101 turn left HDG 100, expect vectors for ILS 22 Approach**
- Controlled flights shall not be vectored into uncontrolled airspace except in the case of emergency or in order to circumnavigate severe weather or at the specific request of the pilot.
- When ATC provides vectors to a VFR flight, the pilot retains responsibility for terrain clearance.
- In terminating vectoring of an aircraft, the controller shall instruct the pilot to resume own navigation.
Ex: **ALK102 resume own navigation**
- If an aircraft is vectored off a STAR (which has its own altitudes and speed restrictions at particular points) specify a new altitude to it.
Ex: **ALK101 descend/climb and maintain FL150**
AIC551 descend/climb to reach FL180 at ATETA (means pilot will maintain FL180 when he reaches ATETA)

5.4 Proceed Direct:

- Instructing an aircraft (with the area navigation capabilities) to fly direct to a waypoint or navaid.
Ex: **KLM881 proceed direct to SARGO**
- For non-area navigation aircraft, use 'proceed direct' to any VOR or NDB when aircraft is within the range of that particular VOR/NDB. (130NM above FL 180, 40NM below FL180 for VORs. 50NM for NDBs.)

Ex: **THA308 turn left hdg 020 proceed direct to MTL** (in this example THA308 has to be within 40NM from MTL VOR if it is below FL180, or within 130NM if it is above FL180)

5.5 Vectoring to final approach path:

The approaching aircraft must be transferred to the TWR controller once established on the final approach axis.

Aircraft shall be transferred:

- Once the aircraft is established on the localizer axis for an ILS, LOC/DME, (i.e. ILS approach)
- Once the aircraft is established on the VOR radial for a VOR, VOR/DME, (i.e. VOR approach)
- Once the aircraft is established on the NDB track for a NDB, (i.e. NDB approach)
- Once the pilot has the runway in sight for a circling approach (visual approach without a preset track)

Note: If the visual approach is using prescribed tracks or circling procedures, the flight will be transferred once established on the localizer axis, the VOR radial or the inbound NDB track. In this case the transfer shall be done well before the pilot starts the visual approach in order to help the tower with the traffic management.

- The approach phases controlled under the direction of an APP controller starts from the time vectoring is initiated, until the aircraft is on final approach and:
 - a) Established on the final approach path of a pilot-interpreted aid; or
 - b) Pilot reports that s/he is able to complete a visual approach
- Prior to, or upon commencement of, vectoring for approach, the pilot shall be advised of the type of approach as well as the runway to be used.

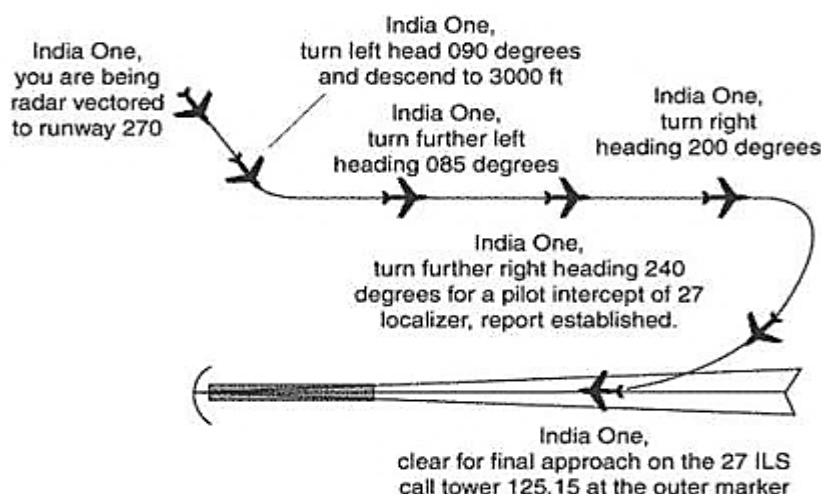
Ex: **BAW45 expect vectors to ILS approach runway 23**

- The controller shall advise an aircraft being vectored for an instrument approach of its position at least once, prior to commencement of final approach.
- When providing distance information, the controller shall specify the point or navigation aid to which the information refers.

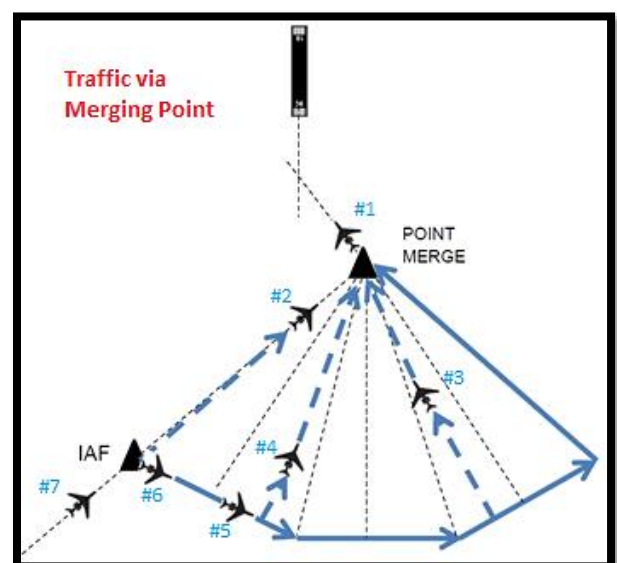
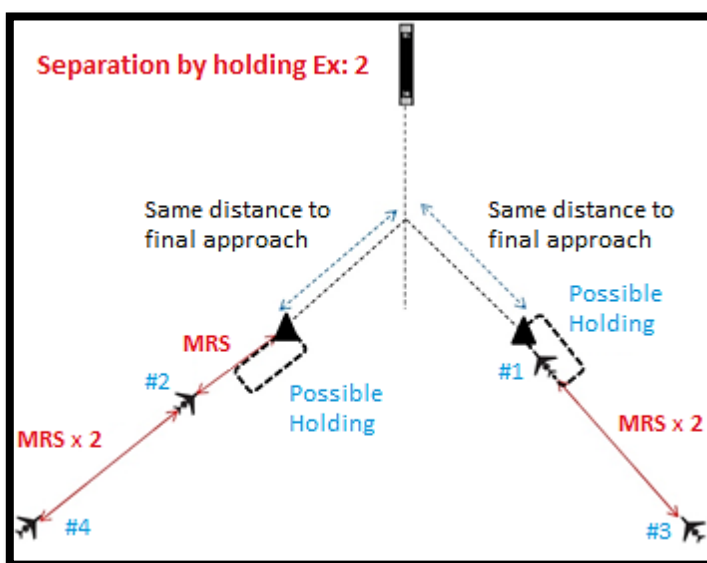
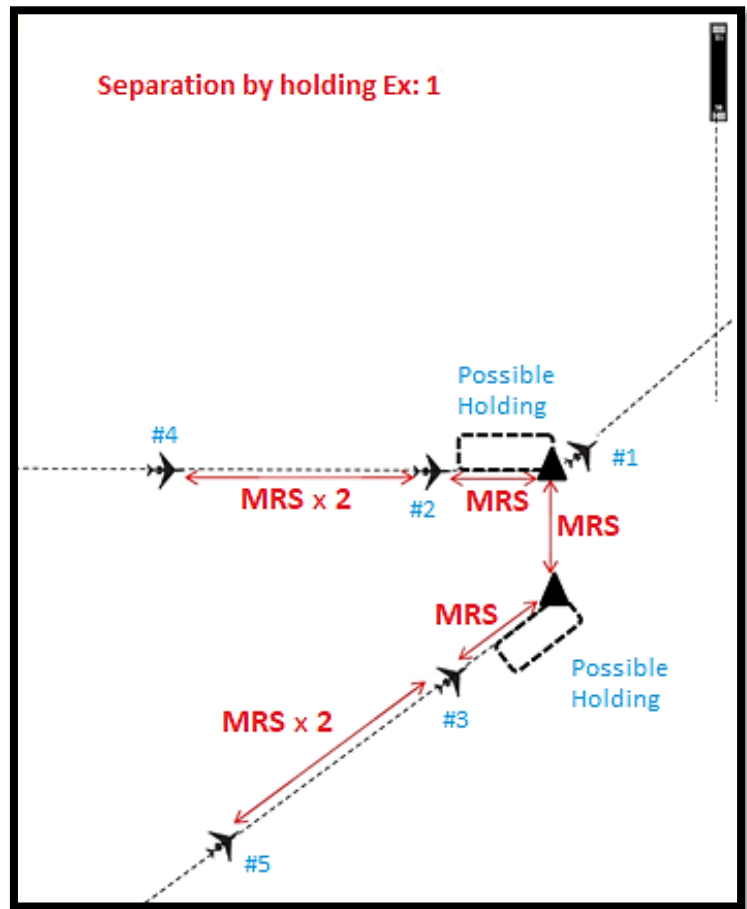
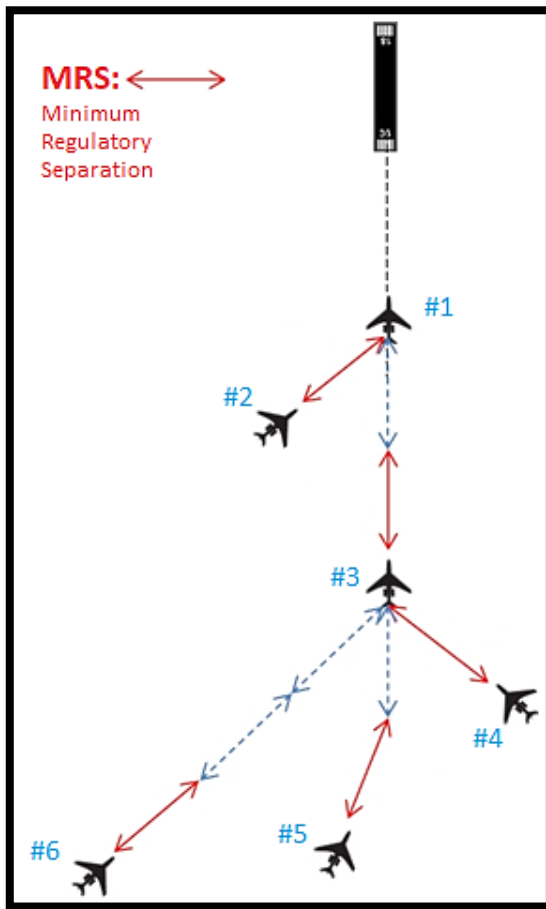
Ex: **ALK202 18 NM from touchdown, or runway number (22), or use the distance from final approach fix.**

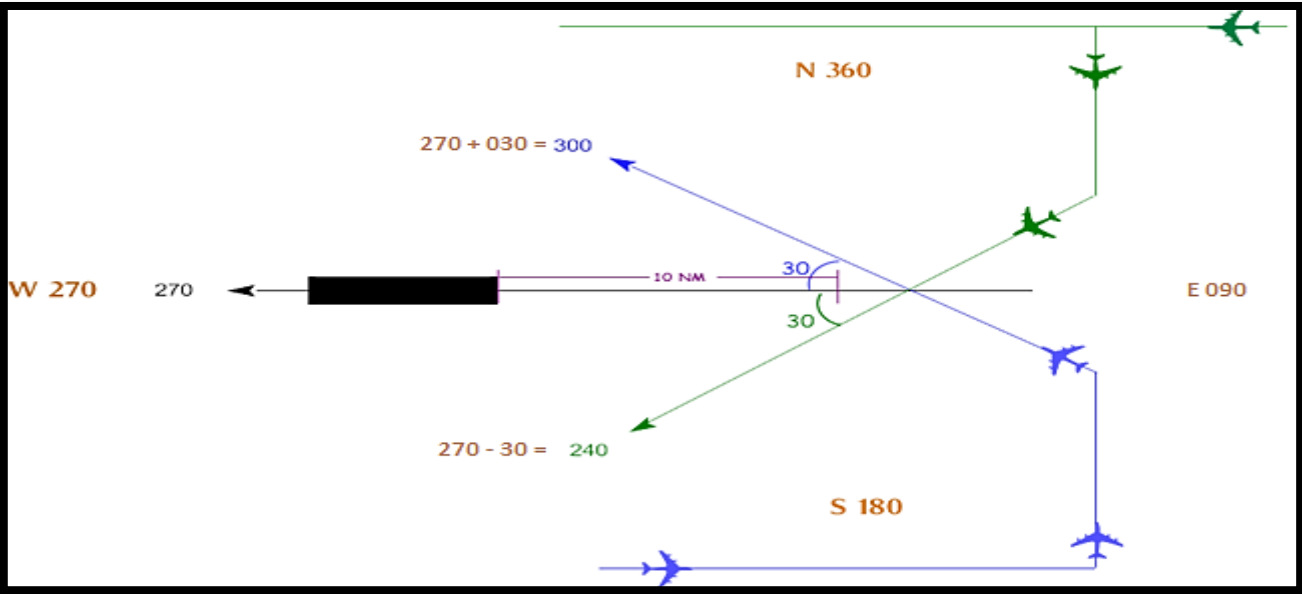
- Aircraft vectored for final approach should be given a heading or a series of headings calculated to complete with the final approach track of 45 degrees or less. (30 degree or less for fixed wing aircraft, and 45 or less for helicopters)
- Clear the aircraft to maintain minimum altitude appropriate to the airport while vectoring for final approach until establish on glide path.

Ex: **QTR665 maintain 2500ft until establish on glide path**



5.6 Examples of Vectoring to final approach path



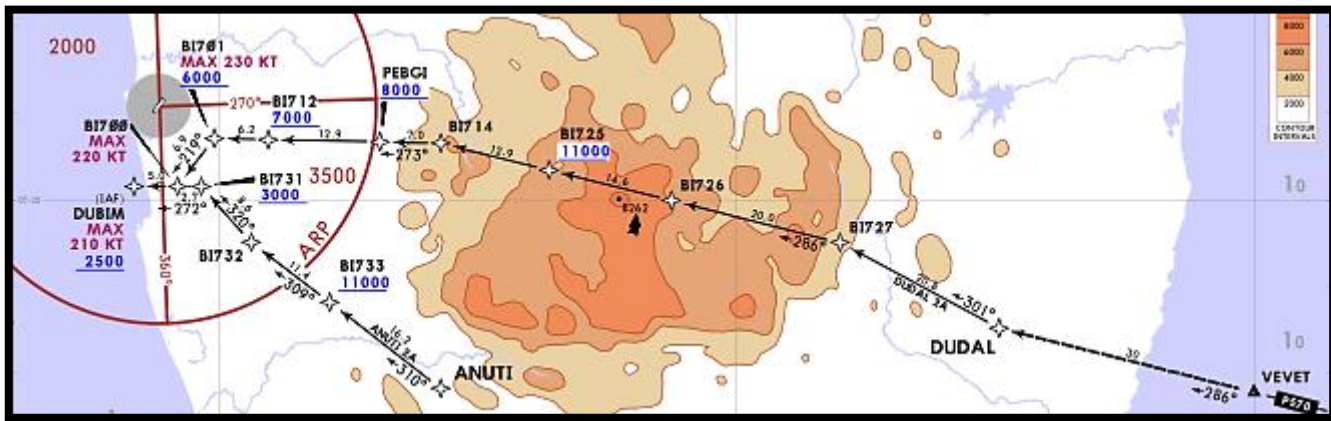


6 Arrival Instructions

6.1 STAR Arrivals:

Unlike radar vector approach, if an aircraft is cleared for a STAR the pilot will maintain own navigation via pre published STAR route.

If the aircraft is to descend using the published altitudes along the STAR inform the pilot to “DESCEND VIA (name) ARRIVAL.”



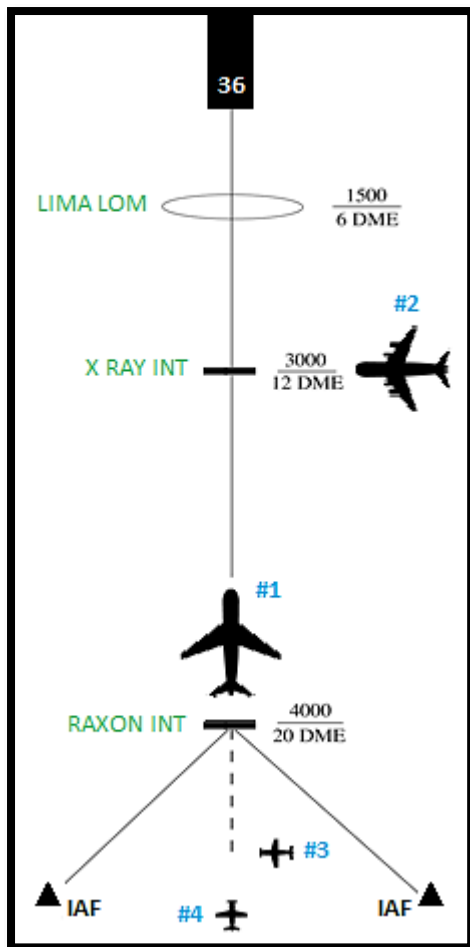
Example of STAR with published altitudes

If no altitudes are published on the STAR or a different altitude is necessary for separation, the controller must assign the altitude(s).

Issue the approach clearance to an aircraft flying an open RNAV STAR at least 3 miles before the runway approach course fix. If unable, provide radar vectors to the aircraft.

At any time it is allowed to cancel a STAR, and provide radar vectors and new altitude.

6.2 Arrival Examples:



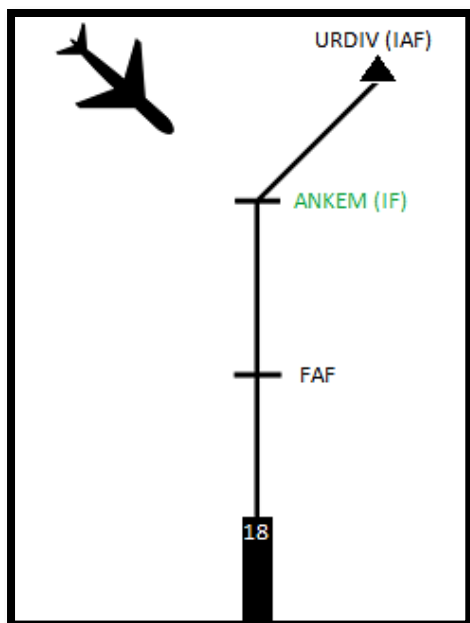
EXAMPLE 1:

Aircraft 1 was vectored to the final approach course but landing clearance was withheld. It is at 4000ft and established on a segment of the instrument approach procedure. “Seven miles from X-RAY. Cleared ILS runway 36 approach.”

Aircraft 2 is being vectored to a published segment of the final approach course, 4 miles from LIMA at 2000ft. The MVA (Minimum Vectoring Altitude) for this area is 2000ft. “Four miles from LIMA. Turn right heading 340. Maintain 2000ft. until established on the localizer. Cleared ILS runway 36 approach.”

Aircraft 3 is being vectored to intercept the final approach course beyond the approach segments, 5 miles from RAXON at 5000ft. The MVA for this area is 4000ft. “Five miles from RAXON. Turn right heading 330. Cross RAXON at or above 4000ft. Cleared ILS runway 36 approach.”

Aircraft 4 is established on the final approach course beyond the approach segments, 8 miles from RAXON at 6000ft. The MVA for this area is 4000ft. “8miles from RAXON. Cross RAXON at or above 4000ft. Cleared ILS runway 36 approach.”



EXAMPLE 2:

Assign an altitude to maintain until the aircraft is established on a segment of a published route or instrument approach procedure.

The aircraft is being vectored to the intermediate fix ANKEM for an RNAV approach. “7 miles from ANKEM, cleared direct ANKEM, cross ANKEM at or above 4000ft., cleared RNAV runway 18 approach.”

6.3 The following procedures shall be used to monitor final approach:

Aircraft observed to overshoot the turn or to continue on a track which will track away from runway approach course should be instructed to return to the correct final approach course immediately. The controller may cancel the approach clearance, and issue missed approach or other instructions to the deviating aircraft.

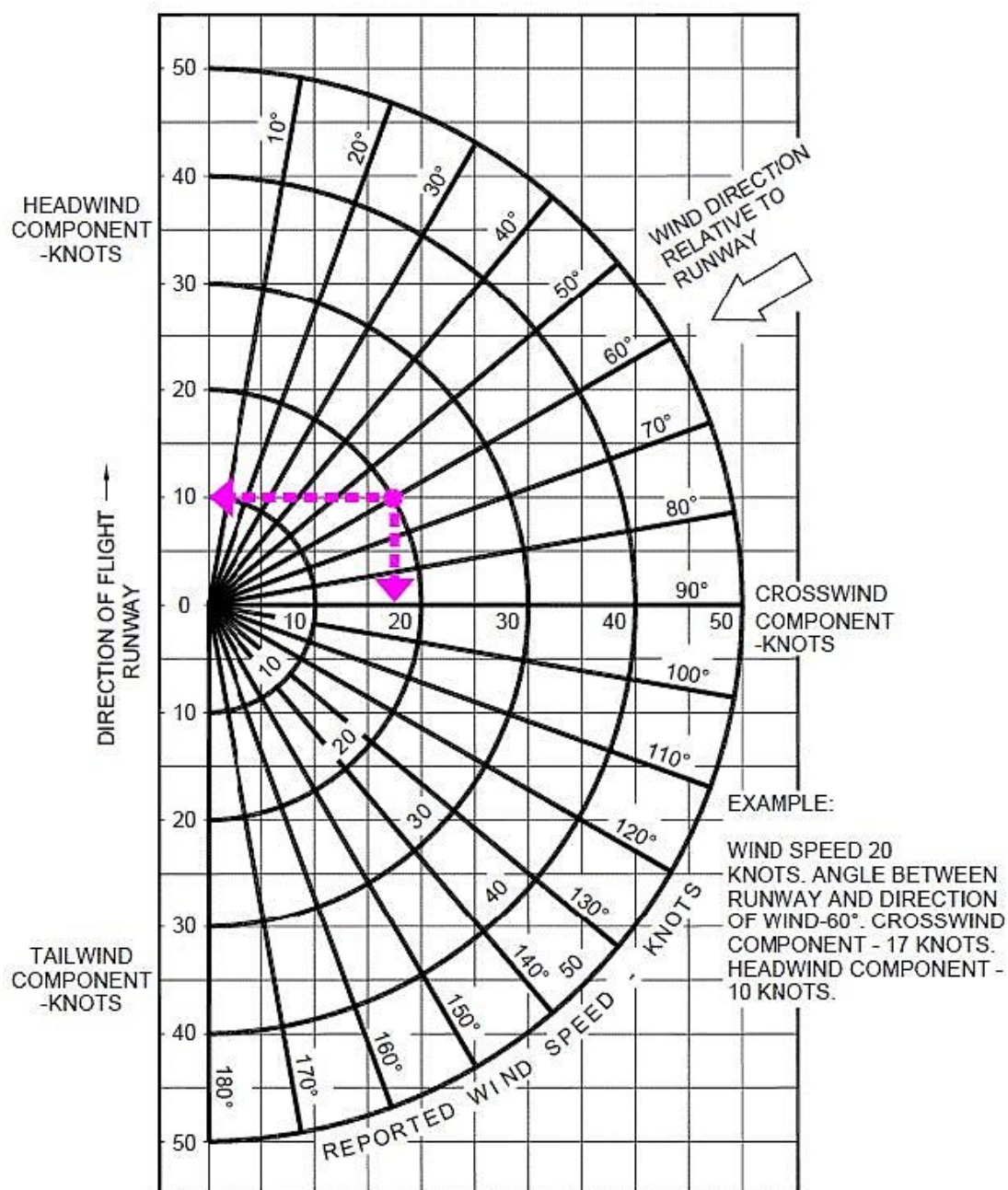
Example:

AIC577 You have crossed the final approach course. Turn (left/right) immediately and return to final approach course.

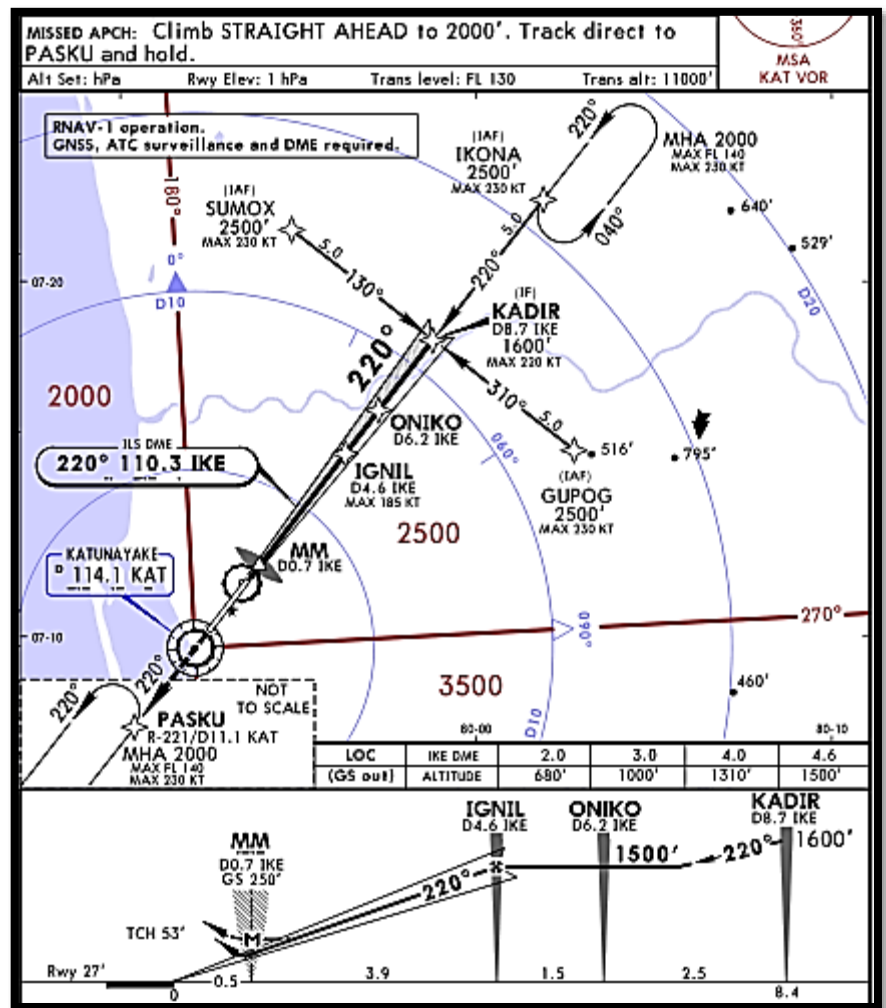
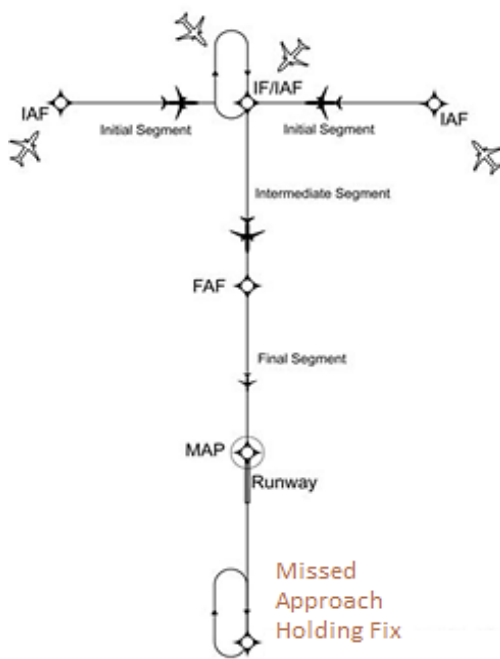
or

AIC577 Turn (left/right) and return to the localizer final approach course.

6.4 Wind Calculator

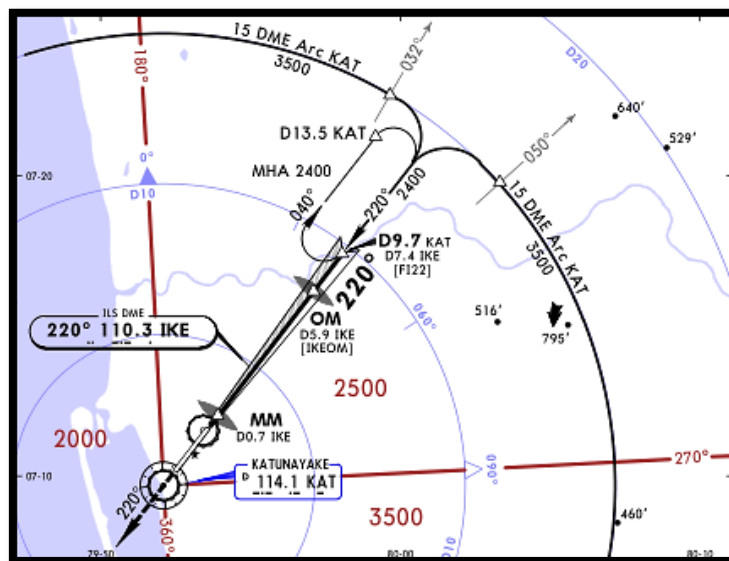


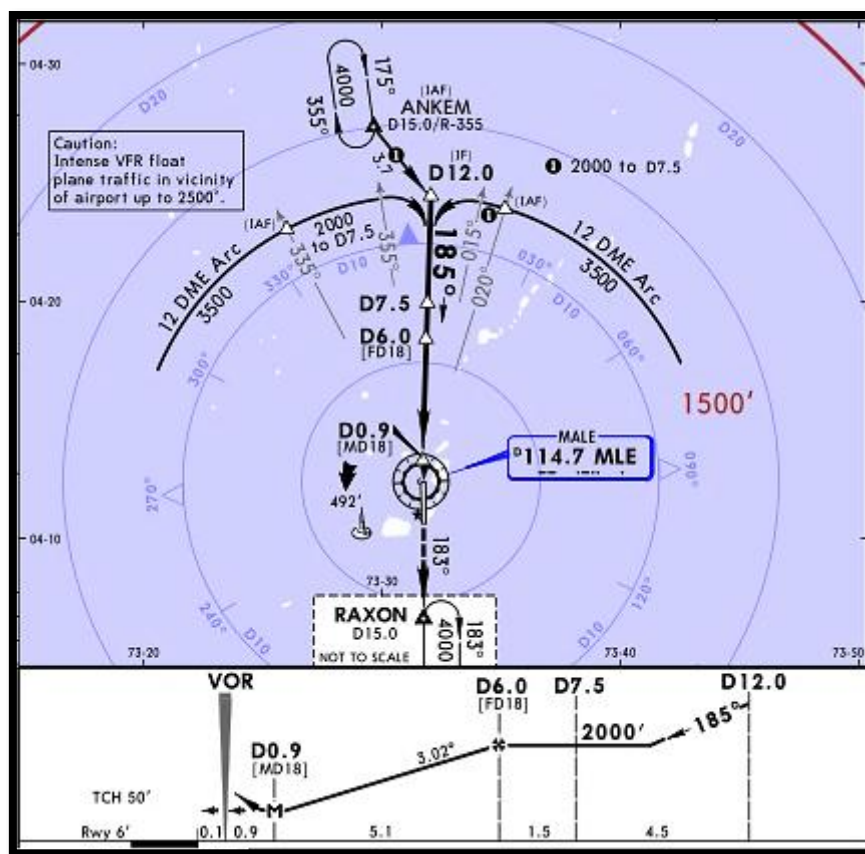
6.5 Basic “T” Design Approach



Example of Colombo VCBI T Approach

6.6 DME Arc Approach





Example of Maldives VRMM Arc Approach

7 Vectoring for Visual Approach

A Visual Approach is an authorization for an IFR aircraft to proceed visually to the runway. It is an IFR procedure only.

In order to clear an aircraft for a Visual Approach the pilot must either report the field in sight, or the preceding aircraft in sight that is going to that field.

Visual Approaches cannot be applied when the visibility is less than 3 miles and the ceiling is less than 500 feet above the MVA (Minimum Vectoring Altitude), or the MIA (Minimum Instrument Altitude).

7.1 VVA Procedure:

Vector the aircraft to the point where it can see the airport.

Issue the traffic advisory to point out the preceding aircraft (if it is following another aircraft).

When aircraft report the airport/aircraft in sight, clear it for the visual approach.

Ex1: DQA27 expect vectors for visual approach runway 18 [Vectors for visual approach runway 18 DQA27]

DQA27 airport is 11'O clock 8 NM report in sight [Airport in sight, DQA27]

DQA27 cleared for visual approach runway 18 [Cleared for visual approach rwy 18, DQA27]

Ex2: LHT87 traffic is 11'O clock 9 NM on final runway 18, B737 at 3700ft report in sight [Traffic in sight, LHT87]

LHT87 follow the traffic cleared for visual approach runway 18 [On final, LHT87]

LHT87 contact tower on 119.70 [Contac TWR 119.70, LHT87]

8 Speed Control

In order to facilitate sequencing or to reduce the need for vectoring, controller may request aircraft to adjust its speed in a specified manner (subject to consideration of the aircraft performance limitation).

Unless pilot agrees in the use of lower speed, the controller should use the following minima for arriving aircraft operating below 10,000ft:

- An IAS not less than 210 knots and an IAS not above than 250 knots (below FL150 not less than 250 IAS for turbojets)
 - Except when the aircraft is within 20 NM of the runway threshold of the airport of landing, an IAS not less than: [the speed at threshold - noted as Vat or Vref]
- | | | |
|---------------------|------------------|--|
| A. Cat A aircraft - | <90 knots | [A – Vat below 90 kts (small aircraft and turboprops)] |
| B. Cat B aircraft - | 91 to 120 knots | [B – Vat 91-120 kts (turboprops, smaller jets)] |
| C. Cat C aircraft - | 121 to 140 knots | [C – Vat 121-140 kts (medium jets)] |
| D. Cat D aircraft - | 141 to 166 knots | [D – Vat 121-166 kts (heavy jets)] |
| E. Cat E aircraft - | >166 knots | [E – Vat 166 or above kts (super heavy jets)] |

An arriving aircraft may be instructed to maintain its “maximum approach speed”, “minimum clean approach speed”, “minimum approach speed”, or a specified speed.

Note: Do not request an aircraft to simultaneously maintain a high rate of descent and reduce its speed, as such manoeuvres are normally not compatible. Any significant speed reduction during descent may require the aircraft to temporarily level off to reduce speed before continuing descent.

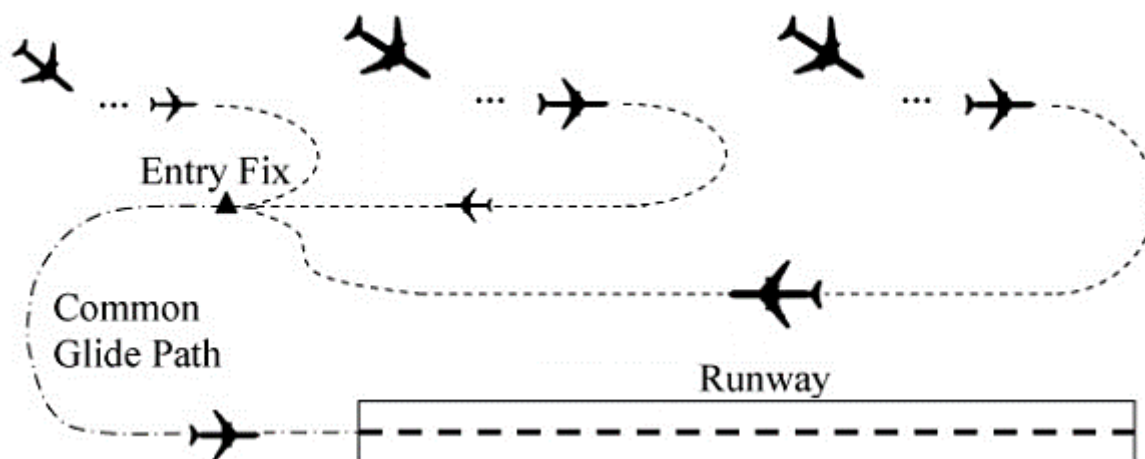
The controller should specify the action which is expected first when combining speed reduction with a descent clearance as follows:

- | | |
|--|---|
| a. Speed reduction prior to descent | Ex: ALK502 reduce speed 210k, then descend to FL140 |
| b. Speed reduction subsequent to descent | Ex: GIA811 descend 8000ft., then reduce speed 210k |

Speed control should not be applied to aircraft:

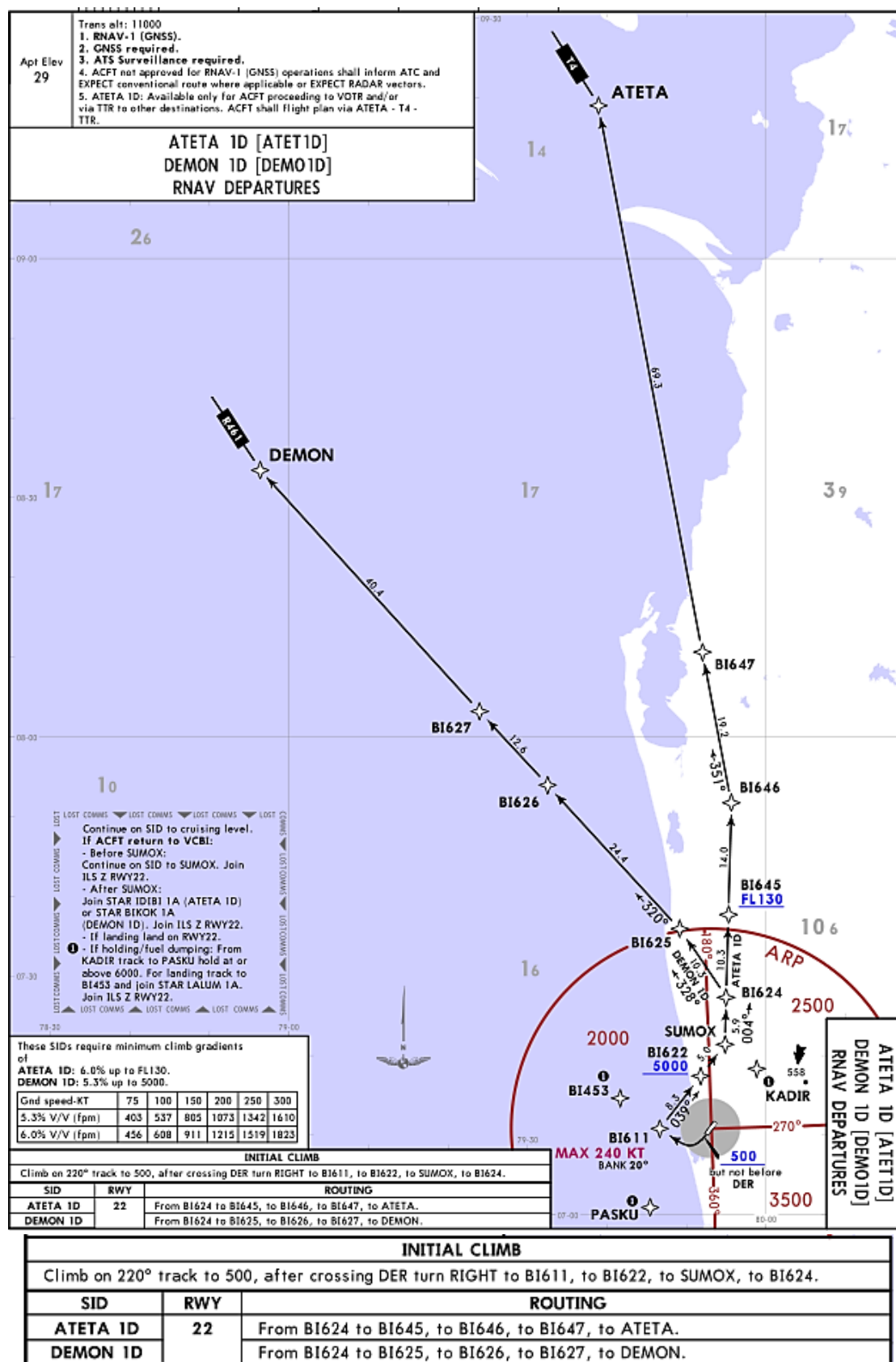
- a. After passing a point 4 NM from the threshold on final approach
- b. Carrying out Cat II / Cat III A ILS approach within 20 NM from touchdown

Speed Control Termination: Aircraft shall be advised when a speed control restriction is no longer required. Use the phrase: ‘NO ATC SPEED RESTRICTIONS’



9 Standard Instrument Departure Routes [SID]

9.1 SID is a pre-planned route which connects the airport to an En-Route waypoint or navaid. Some airports do not have SID.



9.1 Clearances on a SID

PHRASEOLOGY	AIRCRAFT REQUIREMENT	EXAMPLES:
CLIMB VIA SID TO <i>(level)</i>:	(i) climb to the cleared level and comply with published level restrictions; (ii) follow the lateral profile of the SID; and (iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.	ALK131 climb via ATETA 1D to FL130
CLIMB VIA SID TO <i>(level)</i>, CANCEL LEVEL RESTRICTION(S):	(i) climb to the cleared level; published level restrictions are cancelled; (ii) follow the lateral profile of the SID; and (iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.	ALK131 climb via ATETA 1D to FL160, cancel level restriction
CLIMB VIA SID TO <i>(level)</i>, CANCEL LEVEL RESTRICTION(S) AT <i>(point(s))</i>:	(i) climb to the cleared level; published level restriction(s) at the specified point(s) are cancelled; (ii) follow the lateral profile of the SID; and (iii) comply with published speed restrictions or ATC-issued speed control instructions as applicable.	ALK131 climb via ATETA 1D to FL160, cancel level restriction at SUMOX
CLIMB VIA SID TO <i>(level)</i>, CANCEL SPEED RESTRICTION(S):	(i) climb to the cleared level and comply with published level restrictions; (ii) follow the lateral profile of the SID; and (iii) published speed restrictions and ATC-issued speed control instructions are cancelled.	ALK131 climb via ATETA 1D to FL160, cancel speed restriction
CLIMB VIA SID TO <i>(level)</i>, CANCEL SPEED RESTRICTION(S) AT <i>(point(s))</i>:	(i) climb to the cleared level and comply with published level restrictions; (ii) follow the lateral profile of the SID; and (iii) published speed restrictions are cancelled at the specified point(s).	ALK131 climb via ATETA 1D to FL160, cancel speed restriction at BI622
CLIMB UNRESTRICTED TO <i>(level)</i> or CLIMB TO <i>(level)</i>, CANCEL LEVEL AND SPEED RESTRICTION(S)	(i) climb to the cleared level; published level restrictions are cancelled; (ii) follow the lateral profile of the SID; and (iii) published speed restrictions and ATC-issued speed control instructions are cancelled.	ALK131 climb via ATETA 1D to FL160, cancel level and speed restriction

10 Miscellaneous

10.1 Managing Departure

The management of departing flights and SID procedures is handled by the DEP position (when active) which is a subsection of the approach ATC. Whenever the DEP position is not open, all tasks are handled by the APP controller.

After an aircraft is established on a SID and subsequently vectored or cleared to deviate off of the SID or SID transition, pilots must consider the SID cancelled, unless the controller adds "expect to resume SID;" pilots should then be prepared to re-join the SID at a subsequent fix or procedure leg. If the SID contains published altitude and/or speed restrictions, those restrictions are cancelled and pilots will receive an altitude to maintain and, if necessary, a speed. ATC may also interrupt the vertical navigation of a SID and provide alternate altitude instructions while the aircraft remains established on the published lateral path.

10.2 Release to UNICOM

In the absence of the CTR or the adjacent approach controller, the APP handling a departing flight releases the pilot to UNICOM 122.800 just before the TMA boundaries.

10.3 Departure Flights

Controller should allow a margin for horizontal & vertical distance between aircraft in order to handle unexpected changes in flying conditions & errors, and subsequent sequence of situations.

- Pilot error (track change, level change, and speed change)
- Wind condition change (aircraft ground speed change)
- Data delays due to Radar Network latency
- Human factors related to ATC (workload and stress, emergency situations, fatigue)
- Human factors related to pilots (emergency/panic stress, fatigue, distraction)

10.4 Traffic Hazard Information

Information regarding traffic on a conflicting path should be given, whenever practicable, in the following form:

- a) Relative bearing of the conflicting traffic in terms of the 12-hour clock
- b) Distance from the conflicting traffic in nautical miles
- c) Direction in which the conflicting traffic appears to be proceeding
- d) Altitude and type of aircraft, of the conflicting traffic

Ex1: AIC661 traffic 11 O'clock, 9 miles, north bound, at FL180, Boeing 737

Ex2: GIA843 traffic 10 O'clock, 12 miles, opposite direction, descending through FL180 to FL160, B747

10.5 VFR Procedures

In Class D or E Airspace VFR aircraft require entry clearance, e.g. "CLEARED TO ENTER CLASS DELTA AIRSPACE."

Inform the pilot when the aircraft is leaving Class D or E Airspace, e.g. "LEAVING DELTA AIRSPACE RESUME OWN NAVIGATION, RADAR SERVICE TERMINATED, FREQUENCY CHANGE APPROVED."

In Class E Airspace VFR aircraft must establish radio communications before entering.

If a controller responds to a radio call with "(CALLSIGN) STANDBY" communications have been established and the pilot may enter the Class E.

If the aircraft to remain outside the Class E inform aircraft "(CALLSIGN) REMAIN OUTSIDE ECHO AIRSPACE AND STANDBY."

Radar identifies the aircraft using one of the radar identification methods on initial contact.

Handle all VFR aircrafts in CLASS D and E airspace same as IFR arrival and departures, vector as needed if requested by pilot or depend on the traffic, for arriving aircraft vector to the airfield. (If not, VFR aircraft will fly direct to the airfield.)

Do not inform the aircraft to "Expect vectors for Visual approach to runway". VFR pilot is responsible track the aircraft to the airport.

When the aircraft is between 5-10 NM from the airport, hand the aircraft off to tower. For departing aircraft inform when aircraft leave class D or E airspace.

Ex1: 4RUAA radar identified 2 NM east on radial 090 of KAT, maintain VFR below 2500ft, cleared to western boundary. (When aircraft leaves the controlled airspace.)

QTR663 Leaving Echo airspace, resume own navigation, radar service terminated, frequency change approved

Ex2: 4RADD 20 NM to the south, inbound to land, full stop, with Information Bravo

4RADD radar identified at 20 NM fly HDG 270 (if choose to vector) squawk 1200 (when aircraft 5-10 NM hand off to TWR)

10.6 Flight Following

Flight Following is an additional radar service to provide traffic calls/advisories to VFR Aircraft. It is done on a workload permitting basis, meaning that if controller is too busy for the additional workload, then not required to provide it. Inform "Unable".

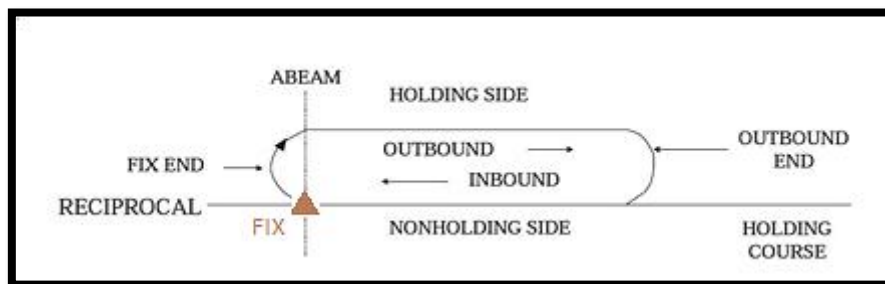
Three steps of providing flight following:

1. Radar Identify the aircraft. Assign a squawk code to provide flight following as required (not compulsory).
2. Issue traffic advisories as to an IFR aircraft. If there is no traffic in the immediate vicinity of the aircraft, advise the aircraft, "No reported traffic in your immediate vicinity"
3. Cancel the flight following at aircraft request, or at controller's discretion. If the aircraft is leaving the control area, cancel the flight following service (do not hand it off to the next controller).

10.7 Holdings

Whenever an aircraft is cleared to a fix other than the destination airport and delay is expected, it is the responsibility of controller to issue complete holding instructions (unless the pattern is charted), and estimated time on hold. Aircraft may be required to hold due to weather, traffic, a late descent, or a variety of other reasons. Hold an aircraft via virtually any fix/DME fix/navaid. The standard hold is one that consists of right hand turns and 1 minute legs.

Holding Pattern Descriptive Terms



Standard Holding Clearance: "(Aircraft Identification), Cleared to the (fix), Hold (direction) on (specified) Radial/Course/Inbound Track."

Non-standard Holding Clearance: “(Aircraft Identification), Cleared to the (fix), Hold (direction) on (specified) Radial/Course/Inbound Track, Left Turns.”

Published Holding Pattern Clearance: “(Aircraft Identification), Cleared to the (fix), Hold (direction) as Published.”

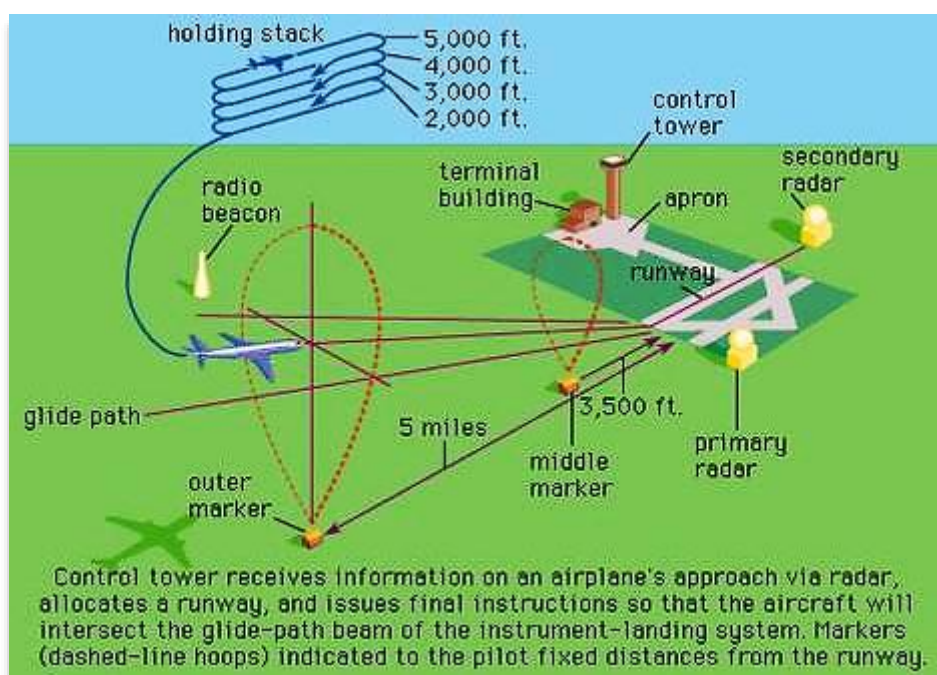
When issuing a holding clearance, include an expect-further-clearance (EFC) time.

All aircraft may hold at the following altitudes and **maximum holding airspeeds**:

Altitude (MSL)	Airspeed (KIAS)
MHA – 6,000’	200
6001ft – 14,000’	230
14001ft. and above	265

Ex1: RCH154 cleared to SUPSA, hold north on G465, Left turns at FL 120 (non-standard holding clearance) expect further clearance in 10 min

Ex2: ALK102 cleared to LALUM, hold as published, expect further clearance in 15 min



10.8 Vectoring and Emergencies

During radar vectoring process, if an aircraft requests priority landing due to an emergency situation, the controller has to vector that aircraft through a route as short as possible to the final approach fix/point (FAF/FAP) of the runway.

An aircraft in an emergency situation has absolute priority over all aircraft in the surrounding area.

The air traffic controller shall follow the basic recommendations:

- Acknowledge the emergency. Ask for pilot's intentions when the situation permits
- Aircraft which are in sequence behind the aircraft in the emergency situation will continue through an unchanged route
- Aircraft which are in sequence in front of the aircraft in the emergency situation will continue to the end of the approach sequence

- Provide time for the pilot to evaluate his/her situation. (Do not press with non-urgent matters.)

The controller shall anticipate the following consequences:

- Aircraft has limited manoeuvrability (partial control over different control surfaces)
- Aircraft has limited flaps settings (or only one setting possible)
- Aircraft has limited bank angle (due to poor manoeuvrability)
- Lack of auto pilot and manual flying
- Fuel dumping time is necessary when the current aircraft weight is higher than the maximum landing weight
- Pilot can request for holding patterns to carry out necessary aircraft checks, extended final, higher approach speed
- Runway could be blocked after landing (if affecting other traffic pilot should be asked to logout from Vatsim)

11 S3 Assessment

Assessment of theory knowledge is evaluated via the SRM & AtSim theory examinations. When a trainee reaches the required standard during mentoring, s/he will be assessed by an authorised instructor who will award the S3 rating, provided that all competencies in the exam criteria have been met.

S3 training should be focussed to achieve competency in the following subject areas:

1) Radiotelephony

- Phraseology and text communications
- RT pace and clarity, monitoring pilot read backs, communication priority

2) Flight Planning

- Airspace knowledge and Area of Responsibility
- SIDs and STARs
- Chart reading (AIP charts)
- Appreciation of aircraft performance limitations
- Contacting and positioning of aircraft from unmanned airspace
- Data block and flight plan maintenance
- Missed approach and recovery
- Understanding of holding procedures, appropriate use of holding
- Stack management
- Runway change
- Workload management (5 - 7 aircraft required)

3) Controlling

- Aircraft identification, validation and verification of SSR data
- Vectoring, continuous descent approach
- Top-down control
- VFR handling – arrival, departure and transit
- Traffic information
- Coordination with Area Control & Tower
- Coordination of non-standard practices

4) Safety

- Safe operating technique
- Order and expedition consistent with safety

5) Meteorology and altimetry

- Advanced METARs
- Compensation for strong wind
- Advanced altimetry concepts, Minimum Stack Level

6) Emergency

- Recognising an emergency situation
- Appropriate prioritisation of traffic
- Coordination with adjacent controllers
- Other assistance as necessary



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