BAHAMAS CIVIL AVIATION DEPARTMENT

ORDER
7110.1

Effective Date: August 13, 2013

SUBJ: Bahamas Air Traffic Control Handbook

The Civil Aviation Act, Chapter 284, of 1987, as amended by The Bahamas Air Navigation Regulations 2001, authorizes the Minister responsible for Aviation to provide necessary facilities and personnel for the protection and regulation of air traffic. The Minister is further authorized and directed to prescribe air traffic rules and regulations governing the flight of aircraft for the protection of persons and property both in the air and on the ground, and to ensure the safe and efficient use of the navigable airspace.

The Deputy Director of Air Traffic Services is responsible for the delivery of air traffic services. All persons involved in the delivery of these services must comply with this order. The Deputy Director of Air Traffic Services is delegated authority in all matters related to the delivery of air traffic services and the policies described in this order. Supplemental changes and requests for waivers to programme and policies transmitted by this manual must receive prior approval, through written requests to the Deputy Director of Air Traffic Services. If a conflict arises between the contents of this order and other CAD issuances, managers shall request clarification from the Deputy Director of Air Traffic Services.
This manual is subject to regular review and improvement as approved by the Director. The CAD has authority to amend the manual, as necessary, to conform to the Bahamas Air Traffic Control Services.

Approved by:

Patrick Rolle
Director, Bahamas Civil Aviation Department

RECORD OF REVISIONS

Insert and remove pages as indicated on the revision cover letter.
For missing pages, contact the Air Traffic Services Directorate, Civil Aviation Department, or Directives Management Officer (DMO) for the Office of Primary Responsibility (OPR).

Rev. No.	Revision Date	Initials	Supv Insp.	Rev. No.	Revision Date	Initials	Supv Insp.
01				26			
02				27			
03				28			
04				29			
05				30			
06				31			
07				32			
08				33			
09				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

Table of Contents

CHAPTER 1 AIR TRAFFIC SERVICES

1-1. PURPOSE OF THIS ORDER

Air Traffic Services within the Bahamas Civil Aviation Department (CAD) are provided in accordance with CAD Orders, Directives, and Laws. Generally these are in line with the Standards and Recommended Practices (SARPS) of the International Civil Aviation Organisation (ICAO).
The Manual of Air Traffic Services contains instructions and guidance for Air Traffic Control Officers (ATCOs) providing Air Traffic Services (ATS) for both routine and many emergency situations. However, nothing in this manual prevents controllers from using their own discretion and initiative in response to unusual circumstances, which may not be covered by the procedures documented in this order.

1-2. AUDIENCE

This directive applies to all CAD organisations and staff.

1-3. WHERE TO FIND THIS ORDER

This order is available in the Office of Primary Responsibility (OPR) through the CAD Directives Management Officer (DMO) or Directives Programme Manager (DPM) and eventually on the BCAD ANS web site.

1-4. LANGUAGE REQUIREMENTS

In accordance with ICAO requirements, the English language shall be used for all operational communications at Air Traffic Service Units (ATSUs) within the Nassau Flight Information Region (FIR).
Operational communication between CAD and non-CAD ATSU's shall, on the part of the CAD, be conducted in the English language.

1-5. AIR TRAFFIC SERVICES

ICAO defines an Air Traffic Service as a generic term meaning:
1. Air Traffic Control Service.

2. Air Traffic Advisory Service.

3. Flight Information Service; or

4. Alerting Service.

1-6. AIR TRAFFIC CONTROL SERVICE

An ATC service is provided according to the particular circumstances and class of airspace, for the purpose of:
1. Preventing collisions between aircraft in the air and on the ground; and

2. Maintaining a safe, orderly, and expeditious flow of air traffic.

1-7. AIR TRAFFIC ADVISORY SERVICE

An Air Traffic Advisory Service is a service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on Instrument Flight Rules (IFR) flight plans.

1-8. FLIGHT INFORMATION SERVICE

Flight Information Service (FIS) is a service provided for the purposes of supplying advice and information useful for the safe and efficient conduct of flight, together with pertinent information about:

1. Weather.

2. Changes to serviceability of facilities.

3. Conditions at aerodromes; and

4. Any other information likely to affect safety.

1-9. ALERTING SERVICE

An Alerting Service is provided to notify appropriate organisations regarding aircraft in need of Search and Rescue (SAR) aid and assist such organisations as required. The responsibility for Alerting Service within CAD airspace is Nassau Approach Control.

1-10. AIR TRAFFIC CONTROL (ATC) UNITS

An ATC Unit is the place from which instructions and advice are given to aircraft in the interest of safety.

The term “ATC unit” will be used in this document when the unit provides an ATC service, or any of the following from the suite of CAD Flight Information Services: Procedural Services; Deconfliction Service; or Traffic Service.

All ATC Units shall provide an Alerting Service to aircraft under their jurisdiction.

1-11. SAFETY AND EXPEDITION

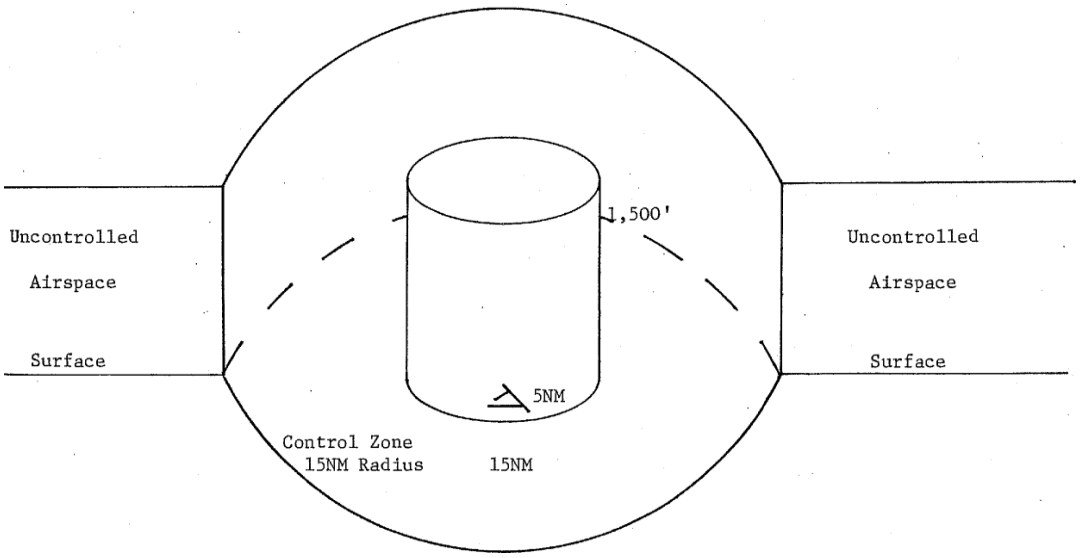
Air traffic service is based upon safety first and expedition second. In complex environments, any deviation from basic procedures in order to expedite traffic should be carefully considered against the extent of co-ordination required and the attendant risk of error. The controller should only deviate from the basic procedures when he is quite sure that the resultant coordination can be carried out without excessive workload and without detriment to the safety of traffic under his control.

1-12 CONTROLLER TEAMWORK

Where controllers are working together they should, whenever possible, pay attention to each other's actions in order to provide an additional safeguard against errors or omissions.

CHAPTER 2. GENERAL RULES FOR AIR TRAFFIC SERVICE

2-1. DIVISION OF AIRSPACE



1. Nassau Terminal Control Area is designated as Class D airspace (as depicted above) and extends from 1500 ft AMSL up to and including 12,000 ft AMSL. The coordinates of the TMA boundaries are located in the CAD Aeronautical Information Publication (AIP).

2. The Nassau CTA/FIR MYNA (Nassau) is Class E airspace unless otherwise designated. The airspace extends upward from 1200 ft above the surface. The coordinates of the Bahamian Domestic Airspace boundaries are located in the CAD aeronautical information publication.

2-2. CLASSIFICATION OF AIRSPACE

The classification of the airspace within an FIR determines the flight rules which apply and the minimum services that are to be provided. These are summarized below.

Class	Flight Rules	Aircraft Requirements	Minimum Services by ATC Unit
A	IFR only	ATC clearance before entry. Comply with ATC instructions.	Separate all aircraft from each other.
B	IFR and VFR	ATC clearance before entry. Comply with ATC instructions.	Separate all aircraft from each other.

C	IFR and VFR	ATC clearance before entry. Comply with ATC instructions.	(a) Separate IFR flights from other IFR and VFR flights; (b) Separate VFR flights from IFR flights; (c) Pass traffic information to VFR flights on other VFR flights and give traffic avoidance advice if requested.
D	IFR and VFR	ATC clearance before entry. Comply with ATC instructions.	(a) Separate IFR flights from other IFR flights; (b) Pass traffic information to IFR flights on VFR flights and give traffic avoidance advice if requested; (c) Pass traffic information to VFR flights on IFR flights and other VFR flights.
E	IFR and VFR	IFR flights to obtain ATC clearance before entry and comply with ATC instructions. VFR flights do not require clearance.	(a) Separate IFR flights from other IFR flights; (b) Pass traffic information, as far as practicable, to IFR flights on VFR flights; (c) VFR flights in contact are to be given traffic information as far as practicable.
F	IFR and VFR	Participating IFR flights are expected to comply with ATC instructions.	Separation provided, as far as possible, between aircraft that have flight planned to operate IFR on ADRs.
G	IFR and VFR	None.	None.

2-3. AIR TRAFFIC CONTROL CLEARANCES

1. Clearances are issued to expedite and separate traffic.
2. Air Traffic clearances are issued based on known traffic conditions, both in the air and on the ground.
3. The pilot-in-command of an aircraft may request, and be granted, an amended clearance if practicable.
4. Air traffic clearances do not alleviate the pilot-in-command of adhering to applicable rules and regulations in BCAD airspace.
5. Clearances must be delivered to aircraft in enough time to ensure compliance.
6. The contents of clearances are contained in Chapter 4 of this document.

7. The safety related parts of clearances shall be read back by the flight crew to the ATCO. (Details of the readback are contained in Chapter 4 of this manual).

2-4. WAKE TURBULENCE CRITERIA

1. Aircraft are grouped into three categories for wake turbulence criteria (weights are given in terms of certified take-off mass):

a. Heavy (H) all aircraft types at 300,000 pounds or more.

b. Medium (M) all aircraft types less than 300,000 pounds but more than 15,500 pounds.

c. Light (L) aircraft types of 15,500 pounds or less.

2-5. ALTIMETER SETTING PROCEDURES

1. The current altimeter setting shall be communicated to aircraft at least once in the ATCO's area of jurisdiction; and

2. Upon request of the aircraft.

2-6. INSTRUMENT FLIGHT RULES

1. A pilot must fly according to instrument flight rules:

a. If the meteorological conditions preclude VFR flight; or

b. At night. (CAD rules do not allow VFR flights between sunset and sunrise)

2. IFR rules require pilots to observe the minimum height rule and additional rules according to the type of airspace. These are summarized below:

a. Within Controlled Airspace (Classes A to E).

b. Conduct the flight in accordance with clearances and instructions from ATC.

c. Maintain a listening watch on the appropriate radio frequencies.

d. Report the position of the aircraft according to published procedures.

2-7. AERODROME TRAFFIC ZONE (ATZ)

1. ATZ's adopt the classification of airspace within which they are situated. Therefore aircraft flying within the ATZ are subject to the Rules of the Air, the specific conditions of the airspace, and the level of ATS provided at the particular aerodrome as follows:

a. At aerodromes with an ATC unit, all movements within the ATZ are subject to the permission of that unit. Aircraft will comply with instructions given by Radiotelephone (RTF) and maintain a listening watch. Non-radio aircraft, which have been given prior permission to fly within the ATZ, will comply with visual signals.

b. At aerodromes where an Aerodrome Flight Information Service (AFIS) or Air/Ground Communications Service (AGCS) is provided, pilots shall obtain information from the unit to enable the flight to be conducted safely within the zone and maintain a listening watch. Non-radio aircraft must comply with any conditions prescribed by the unit prior to the commencement of the flight.

c. ATCOs who need to ascertain whether a pilot will either route around or transit through an ATZ in Class G airspace should advise the pilot of the ATZ status and confirm the pilot's intentions. ATCOs may advise pilots to change to the published aerodrome Radio

Telephony Frequency (RTF) to either obtain ATZ crossing clearance from an ATC unit, or to obtain information from an AFIS or AGCS unit.

2-8. CANCELLATION OF IFR FLIGHT

1. Change from IFR flight to VFR flight shall only be acceptable when the pilot uses the expression "cancelling my IFR flight". Pilots must not be invited to cancel, but if there is any doubt about a pilot's intentions, he may be asked if he wishes to cancel his IFR flight plan.

2. ATCOs are to acknowledge a cancellation using the phrase "IFR plan cancelled at (Time)".

3. Pilots cancelling IFR plans shall be given any information which indicates that Instrument Meteorological Conditions (IMC) maybe encountered along the intended route.

4. Air Traffic Service (ATS) Units receiving notification of an aircraft's intention to change from IFR to VFR flight shall, as necessary, by automated means or otherwise, inform subsequent ATS units of the IFR flight plan cancellation.

2-9. FLIGHT PLANS

1. A pilot may file a flight plan for any flight.

2. A pilot is required to file a flight plan for:

a. All flights within controlled airspace, which are conducted in accordance with IFR.

b. When he/she wishes to receive an Air Traffic Advisory Service (ATAS).

c. All flights which will cross an international FIR boundary.

d. All flights departing Lynden Pindling International Airport and Grand Bahama International Airport.

3. A pilot is advised to file a flight plan:

a. If his/her flight involves flying in Bahamian airspace.

b. If the pilot intends to fly into an area in which SAR operations are in progress, the flight plan should include the expected times of entering and leaving the area.

c. When receiving a flight plan the Bahamas Civil Aviation Department shall:

i. Check it for compliance with the format and data conventions.

ii. Check it for completeness and, to the extent possible, for accuracy.

iii. Take action, if necessary, to make it acceptable to the air traffic services; and

iv. Any filed flight plan that specifies a non-standard route at aerodromes where Standard Instrument Departures (SIDs) are designated should be referred back to the originator for correction.

v. Indicate acceptance of the flight plan or change of the plan to the filer.

2-10. METEOROLOGICAL INFORMATION (INCLUDES PILOT INFORMATION REPORTS)

1. When ATCO's receive meteorological information by voice or other means it shall be forwarded to the meteorological office upon receipt.

2. Significant meteorological information shall be disseminated to aircraft until deemed to be no longer valid. (This includes pilot reports or other significant weather information). Items to be included:

a. Severe Turbulence.

b. Thunderstorms of all types.

c. Volcanic ash cloud.

d. Pre-eruption volcanic activity or a volcanic eruption.

2-11. REPETITIVE FLIGHT PLAN

The repetitive flight plan scheme is a more convenient method of filing flight plans for flights that operate regularly. Only one plan is filed and the details are brought forward for each flight.

CHAPTER 3. SEPARATION STANDARDS

3-1. VERTICAL OR HORIZONTAL SEPARATION

1. Standard vertical or horizontal separation shall be provided, unless otherwise specified:

a. Between all flights in Class A and B airspaces.

b. Between IFR flights in Class C, D and E airspaces.

c. Between IFR flights and VFR flights in Class C airspace.

d. Between IFR flights and special VFR flights.

2. Standard separation may be reduced when a SAR aircraft is escorting an aircraft in an emergency. A minimum is not laid down in Nassau FIRs and separation may be reduced to that which can be maintained visually or with airborne radar.

3. When one type of separation is not sustainable another type must be established before minimums are infringed.

3-2. VERTICAL SEPARATION

1. Vertical separation is established by having aircraft operate at different levels using current altimeter settings.

2. Standard vertical separation is 1000 feet.

3. An Aircraft may be assigned an altitude after the aircraft in conflict has reported leaving it except:

a. In severe turbulence conditions.

b. The higher aircraft is in a cruise climb.

c. A large difference in performance characteristics between the aircraft.

3-3. VMC CLIMB AND DESCENT

To avoid excessive delays to traffic when ATS surveillance systems are not available, ATCOs may authorize an aircraft to climb or descend in Visual Meteorological Conditions (VMC) provided:

1. Essential traffic information is given.

2. The pilot of the aircraft climbing or descending agrees to maintain his own separation from other aircraft and the maneuver is agreed by the pilot of the other aircraft.

3. It is during the hours of daylight.

4. The aircraft is flying in visual meteorological conditions.

5. The maneuver is restricted to Class D, E, F and G airspace at or below FL100.

3-4. HORIZONTAL SEPARATION

The two types of horizontal separation are:

1. Lateral separation.

2. Longitudinal separation.

Explanation of Terms:
"Level change" means that portion of the climb and descent during which the vertical separation in relation to the level of another aircraft is less than the minima.
An "exact reporting point" is a position established by a navigational unit which is:

1. Overhead a Very High Frequency (VHF) Omni-directional Range (VOR).

2. Overhead a Non-directional Beacon (NDB).

3. A position notified as a reporting point and which is established by the intersection of VOR radials, or of a VOR radial and a bearing from an NDB.

4. A position established by a VOR radial combined with a range from a co-located or associated Distance Measuring Equipment (DME).

5. Separation Based on VOR/DME/Tactical Air Navigation (TACAN) Information.

a. Where measured distance values are used, each aircraft must be using the same "on track" VOR/DME/TACAN unit, i.e., the aircraft must be flying towards or away from the same unit.

b. Communication must be maintained with the aircraft concerned throughout the period that measured distance values are being used to achieve separation. Separation is to be checked by obtaining simultaneous DME/TACAN readings from aircraft at intervals of not more than 10 minutes.

3-5. LATERAL SEPARATION

1. Lateral separation shall be applied so that the distance between aircraft is never less than a specified amount. It is achieved by requiring aircraft to fly on different tracks or in different geographical locations as determined by visual observations or by use of navigational aids.

2. ATC personnel shall ensure IFR aircraft, when procedural conditions exist, are assigned the minima or diverging courses in accordance with the following tables.

3. Use the table below to determine the distance required for various divergence angles to clear the airspace to be protected. For divergence that falls between two values, use the lesser divergence value to obtain the distance.

TABLE 1 NON-DME/DME WITH VOR DIVERGENCE DISTANCE MINIMA (FIGURE 3-1 AND 3-2)

Divergence (Degrees)	Distance (NM)
15	17
20	17
25	17
30	11
35	11
45	8
55	8
90	8

Note 1: This table is for Non-DME/DME with VOR application.
Note 2: The above distances are predicated on the Bahamas Route structure being 10 miles.
Note 3: When aircraft are non-DME equipped, ATCOs must apply a time restriction based on the performance of the aircraft involved.

TABLE 2 NON-DME/DME WITH NDB DIVERGENCE-DISTANCE MINIMA (FIGURE 3-3)

Divergence (Degrees)	Distance (NM)
30	15
45	12
90	5

Note 1: This table is for Non-DME/DME with NDB application.
Note 2: The above distances are predicated on the Bahamas Route structure being 10 miles.
Note 3: When aircraft are non-DME equipped, ATCOs must apply a time restriction based on the performance of the aircraft involved.

4. When transitioning aircraft into airspace where a greater lateral separation standard applies and aircraft have the navigation capability to ensure accurate track guidance separation shall exist when aircraft are established on tracks that:

a. Are separated by an appropriate minimum.

b. Diverge by at least 15 degrees until the minimum lateral separation is established.

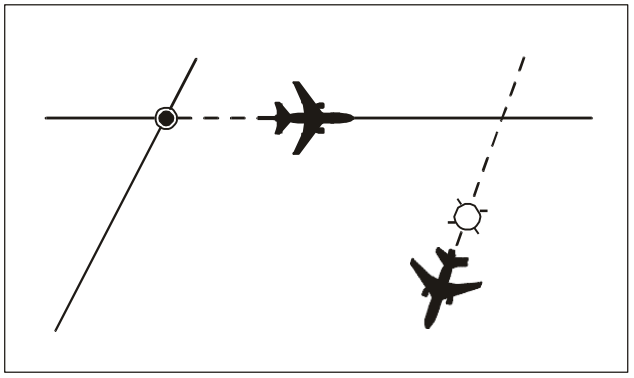


Figure 3-1. Using same or different geographic locations (See 3-5 (1))

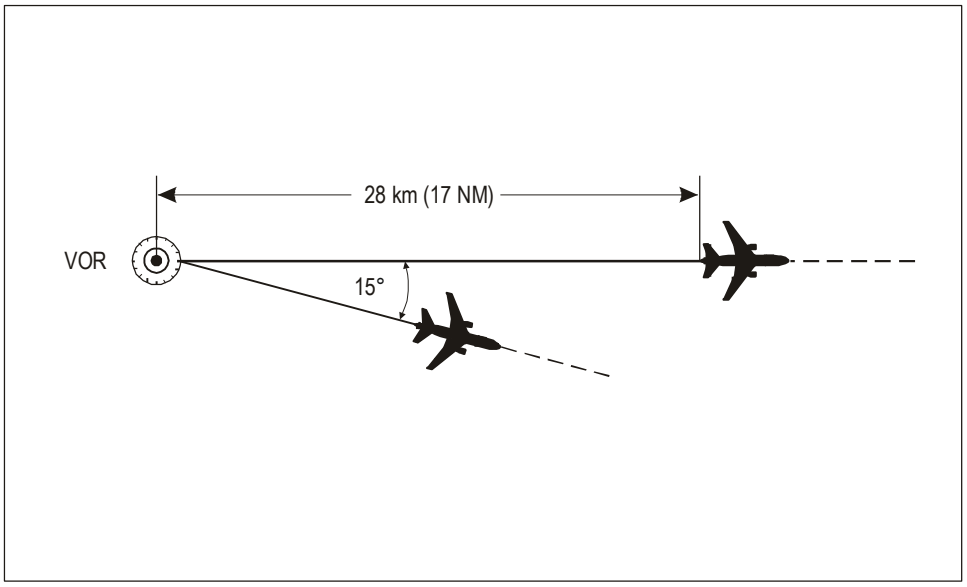


Figure 3-2. Separation using the same VOR (See 3-5 (1))

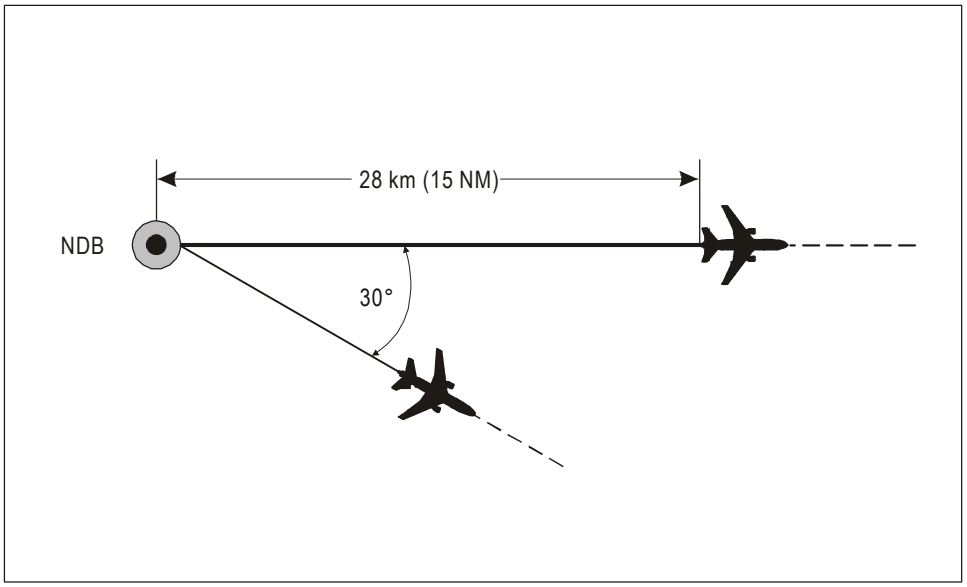


Figure 3-3. Separation using the same NDB (See 3-5 (1))

3-6. LONGITUDINAL SEPARATION--TIME AND DISTANCE

1. Longitudinal separation based on either time or distance shall be applied so that the spacing between the estimated positions of the aircraft being separated is never less than a prescribed minima. Longitudinal separation between aircraft on the same or diverging tracks can be maintained by speed control.

2. Longitudinal can be achieved by requiring aircraft to:

a. Depart at a specified time.

b. Lose or gain time to arrive at a geographical location at a specified time; or

c. Hold over a geographical location until a specified time.

3. For the purposes of longitudinal separation the following definitions apply:

a. “Same Track” is defined as same direction tracks and intersecting tracks or portions of tracks which have an angular difference that is less than 45 degrees or more than 315 degrees and whose protected airspaces overlap. (See Figure 3-4)

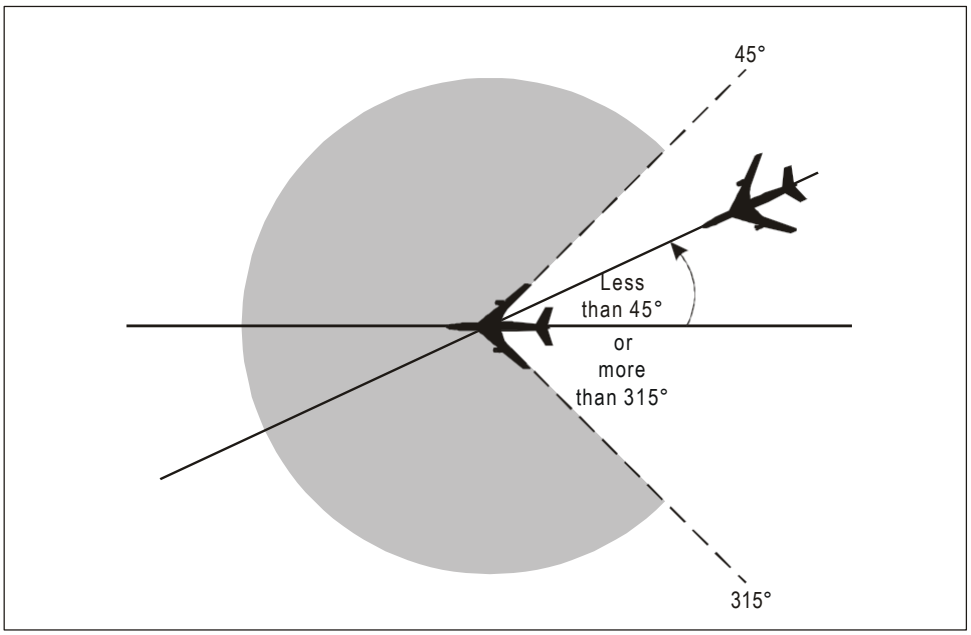


Figure 3-4. Aircraft on same track (See 3-6 (3, a))

b. "Reciprocal Tracks" is defined as opposite and intersecting tracks or portions of tracks which have an angular difference of more than 135 degrees but less than 225 degrees. (See Figure 3-5)

c. "Crossing Tracks" is defined as intersecting tracks or portions other than a and b. (See Figure 3-6)

4. Standard Longitudinal separation is defined as 20 nautical miles.

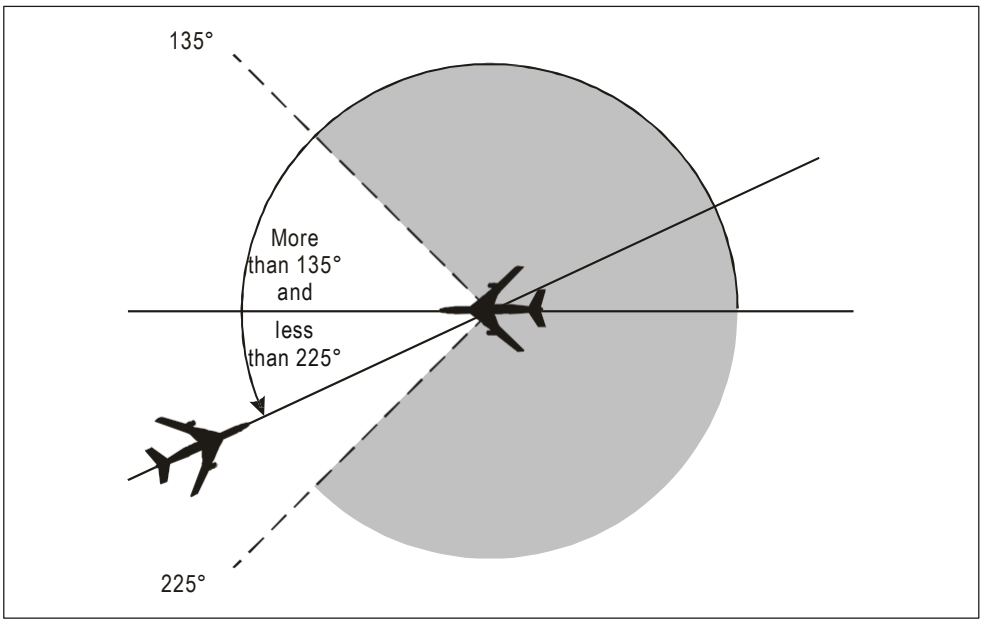


Figure 3-5. Aircraft on reciprocal tracks (See 3-6 (3, b))

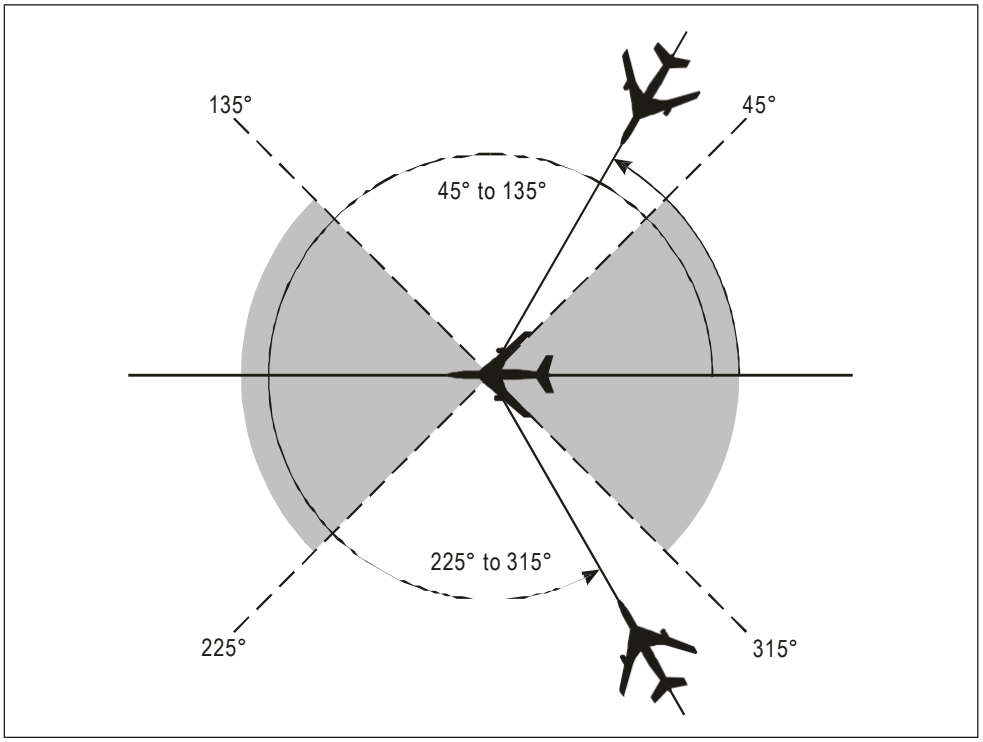


Figure 3-6. Aircraft on crossing tracks (See 3-6(3,c))

3-7. LONGITUDINAL SEPARATION MINIMA BASED ON TIME

1. Separation of aircraft on the same track and altitude;

a. 15 minutes (See Figure 3-7); or

b. 10 minutes if navigation aids permit frequent determination of position and speed. (See Figure 3-8)

c. 5 minutes when the leading aircraft is 20 kts. faster than the aircraft following (See Figure 3-9) and in one of the following situations:

i. Between aircraft that have departed from the same aerodrome.

ii. Between aircraft that have reported over the same reporting point.

iii. Between a departing and en-route aircraft provided that the en-route aircraft has reported over a point that can establish 5 minutes separation at the point the departing aircraft will join an air route.

d. 3 minutes in the situations listed above provided that the lead aircraft is 40 kts. faster than the aircraft following. (See Figure 3-10)

2. Aircraft on the same level and on crossing tracks:

a. 15 minutes at the point of the intersection of the tracks. (See Figure 3-11)

b. 10 minutes if navigation aids permit frequent determination of position and speed. (See Figure 3-12)

3. Aircraft climbing or descending on the same track; When an aircraft will pass through the altitude of another aircraft:

a. 15 minutes while vertical separation does not exist. (See Figures 3-13a and 3-13b.)

b. 10 minutes while vertical separation does not exist provided that navigation aids permit frequent determination of aircraft position and speed. (See Figures 3-14a and 3-14b)

c. 5 minutes while vertical separation does not exist, provided that the level change is commenced within 10 minutes of the time the second aircraft has reported over an exact reporting point. (See Figures 3-15a and 3-15b.)

4. Aircraft climbing or descending on crossing tracks:

a. 15 minutes while vertical separation does not exist. (See Figures 3-16a and 3-16b)

b. 10 minutes while vertical separation does not exist if navigational aids permit frequent determination of aircraft position and speed. (See Figures 3-17a and 3-17b.)

5. Aircraft climbing or descending on a reciprocal track.

a. Where lateral separation is not provided vertical separation shall be provided for at least 10 minutes prior to and after the time the aircraft are estimated to pass or have been estimated to pass. (See Figure 3-18)

b. If it has been determined the aircraft have passed each other by position report, this minimum does not apply.

3-8. LONGITUDINAL SEPARATION MINIMA BASED ON DISTANCE (USING DME AND GNSS)

1. Separation shall be established by maintaining not less than specified distance between aircraft positions as reported by DME in conjunction with navigational aids and/or GNSS. Separation can be applied between two aircraft using DME, or two aircraft using GNSS, or one aircraft using DME and one aircraft using GNSS. Direct pilot-controller communication must be maintained while applying this type of separation is applied.

2. Aircraft at the same altitude and on the same track:

a. 20 miles provided each aircraft:

i. Utilising the same on track station when both aircraft are utilizing DME; or

ii. Utilising an on track DME station and a collated waypoint when one aircraft is utilizing DME and the other is utilizing GNSS; or

iii. The same waypoint when both aircraft are utilizing GNSS.

b. Separation must be checked using simultaneous DME/GNSS readings from the aircraft at frequent intervals. (See Figure 3-19)

c. 10 miles provided, the leading aircraft maintains a true airspeed 20 kts. or faster than the following aircraft and each aircraft meets the conditions listed above. (See Figure 3-20)

3. Aircraft at the same altitude and on crossing tracks; The longitudinal separation provisions listed above in 3-8, 2 shall apply provided each aircraft reports distance from the same DME station and/or collated waypoint or the same waypoint located at the crossing point of the tracks and that the relative angle between the tracks is less than 90 degrees. (See Figures 3-21a and 3-21b)

4. Aircraft climbing and descending and on the same track:

a. 10 miles provided each aircraft utilizes:

i. Utilising the same on track station when both aircraft are utilizing DME; or

ii. Utilising an on track DME station and a collated waypoint when one aircraft is utilizing DME and the other is utilizing GNSS; or

iii. The same waypoint when both aircraft are utilizing GNSS.

b. One aircraft maintains altitude while vertical separation does not exist.

c. Separation must be established using simultaneous DME/GNSS readings from the aircraft at frequent intervals. (See Figure 3-22a and 3-22b)

5. Aircraft on reciprocal tracks; Aircraft utilizing on track DME and/or collocated waypoint or same waypoint may be cleared to climb or descend through the levels occupied by other aircraft utilizing on track DME and/or collated waypoint or same waypoint, provided that it has been positively established that the aircraft have passed each other and are at least 10 miles apart.

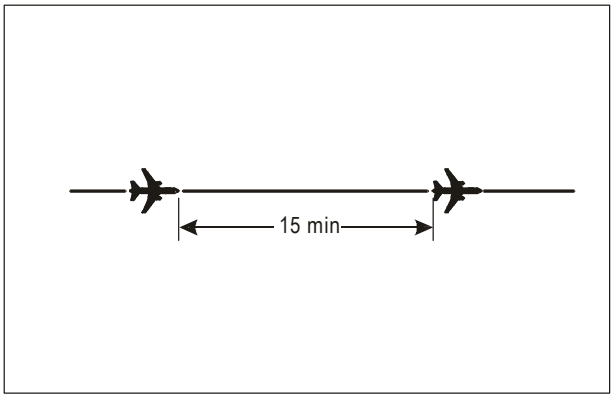


Figure 3-7. Fifteen-minute separation between aircraft on same track and same level (See 3-7 (1, a))

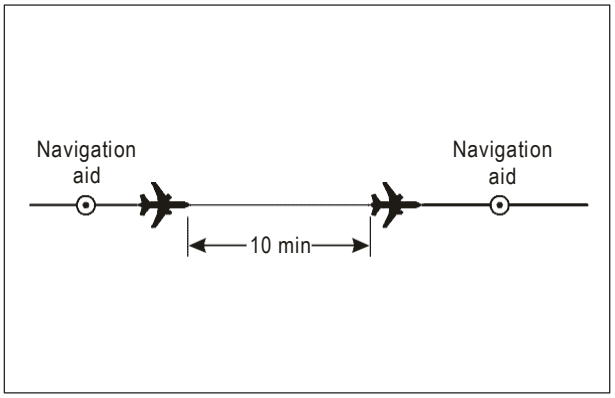


Figure 3-8. Ten-minute separation between aircraft on same track and same level (See 3-7 (1, b))

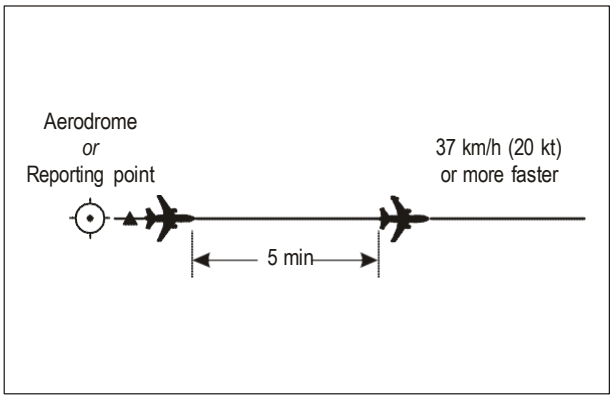


Figure 3-9. Five-minute separation between aircraft on same track and same level (See 3-7(1, c))

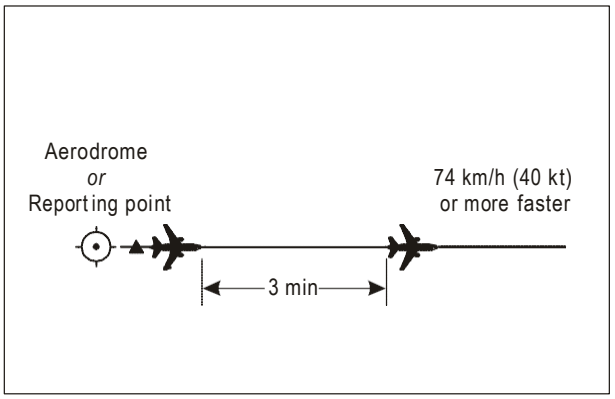


Figure 3-10. Three-minute separation between aircraft on same track and same level (See 3-7(1, d))

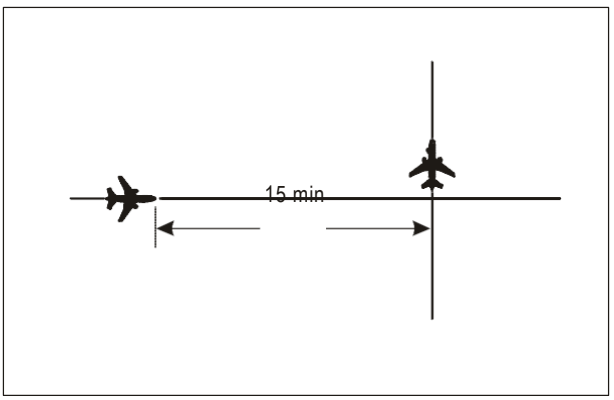


Figure 3-11. Fifteen-minute separation between aircraft on crossing tracks and same level (See 3-7(2, a))

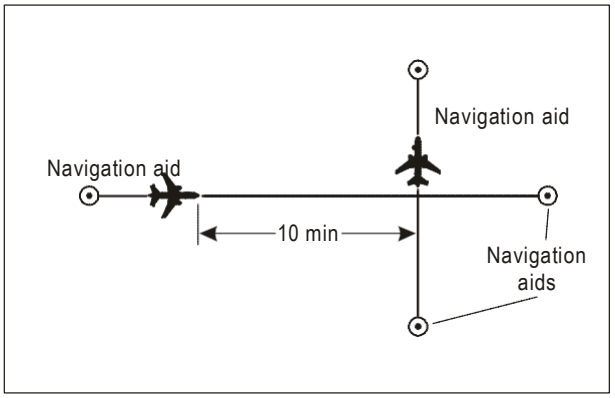


Figure 3-12. Ten-minute separation between aircraft on crossing tracks and same level (See 3-7(2, b))

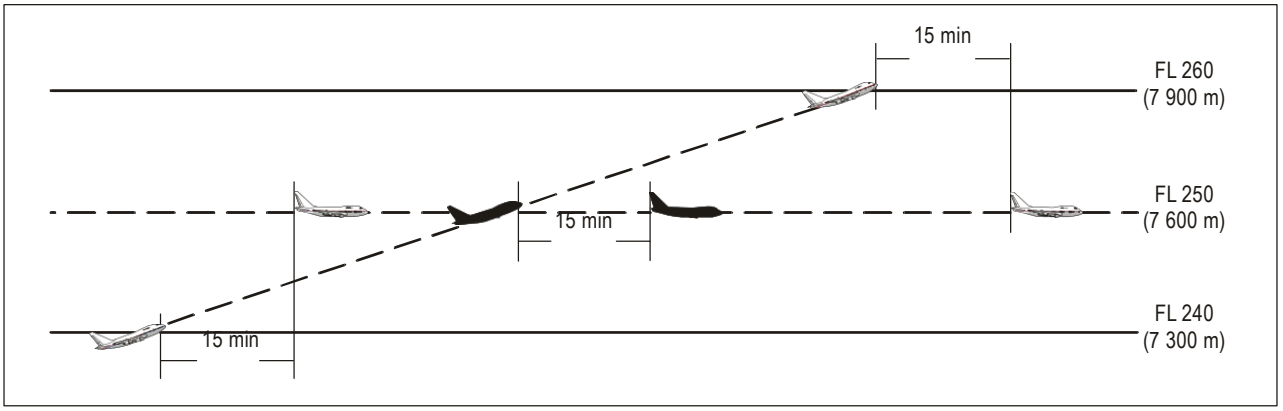


Figure 3-13A. Fifteen-minute separation between aircraft climbing and on same track (See 3-7(3, a))

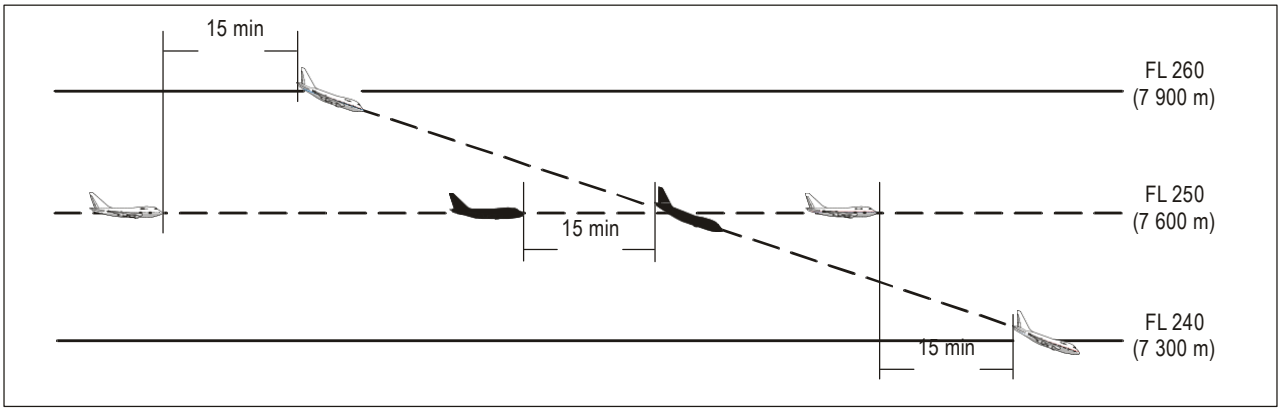


Figure 3-13B. Fifteen-minute separation between aircraft descending and on same track (See 3-7(3, a))

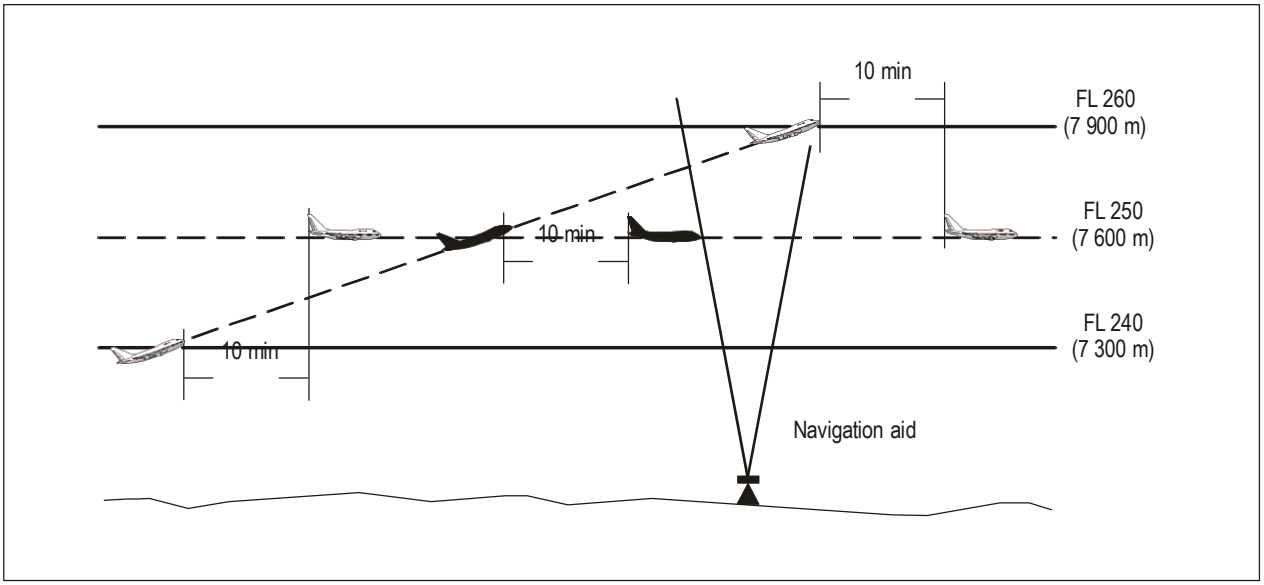


Figure 3-14A. Ten-minute separation between aircraft climbing and on same track (See 3-7(3, b))

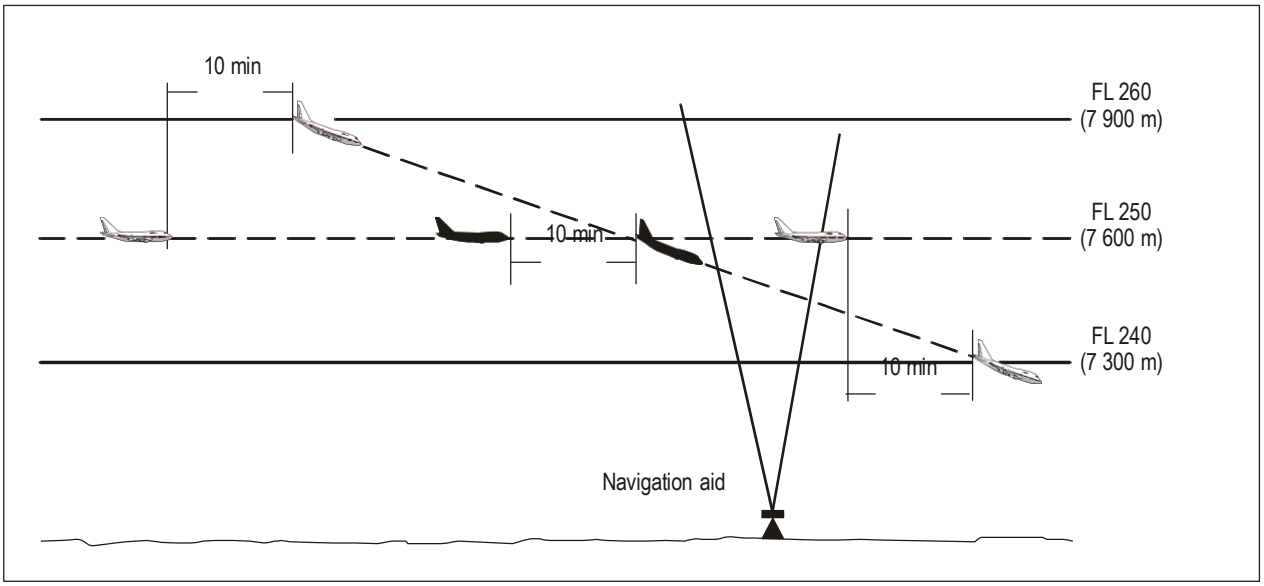


Figure 3-14B. Ten-minute separation between aircraft descending and on same track (See 3-7(3, b))

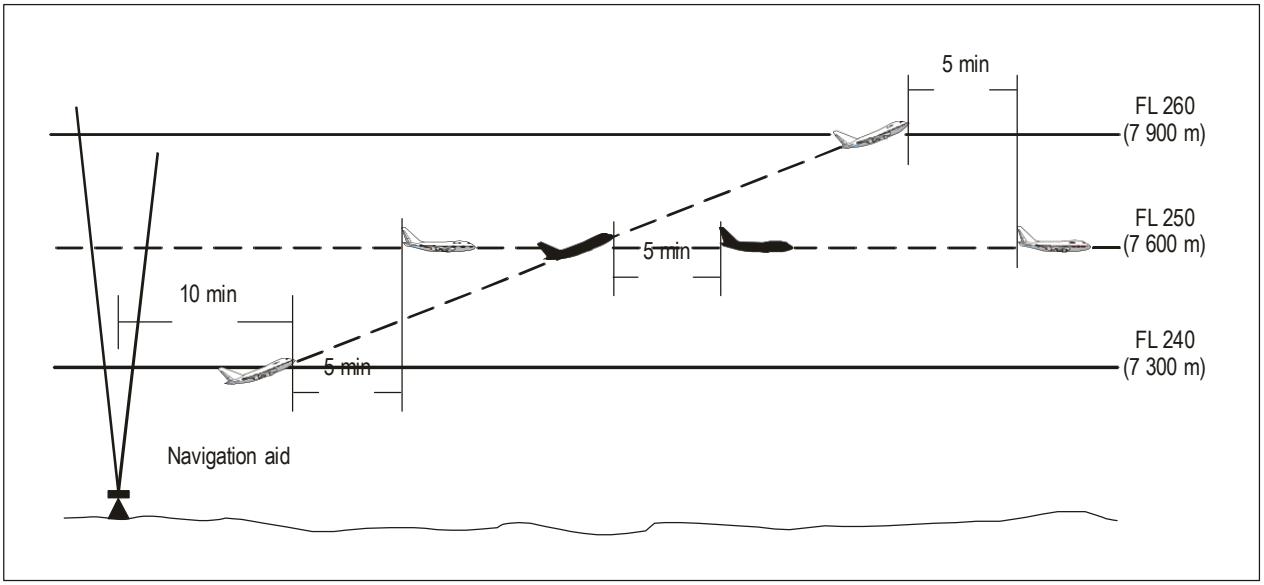


Figure 3-15A. Five-minute separation between aircraft climbing and on same track (See 3-7(3, c))

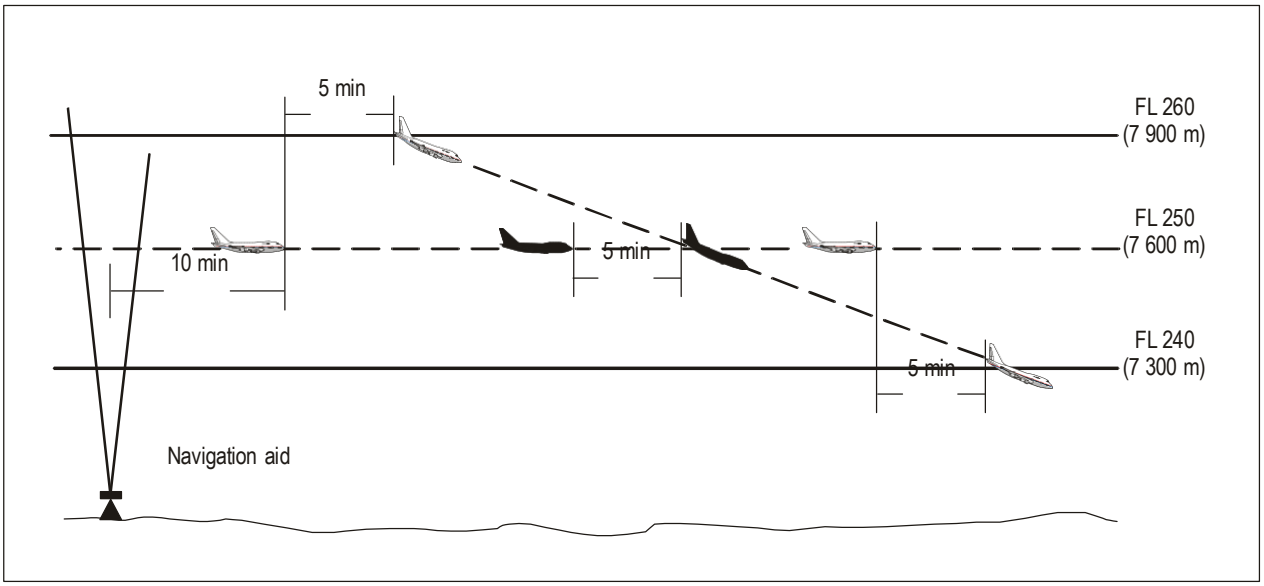


Figure 3-15B. Five-minute separation between aircraft descending and on same track (See 3-7(3, c))

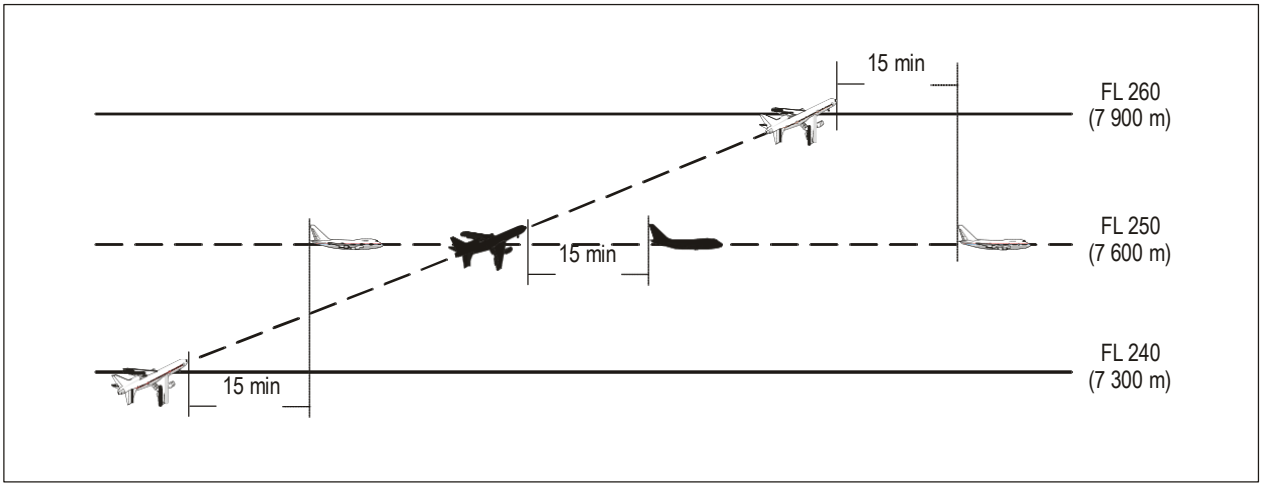


Figure 3-16A. Fifteen-minute separation between aircraft climbing and on crossing tracks (See 3-7(4, a))

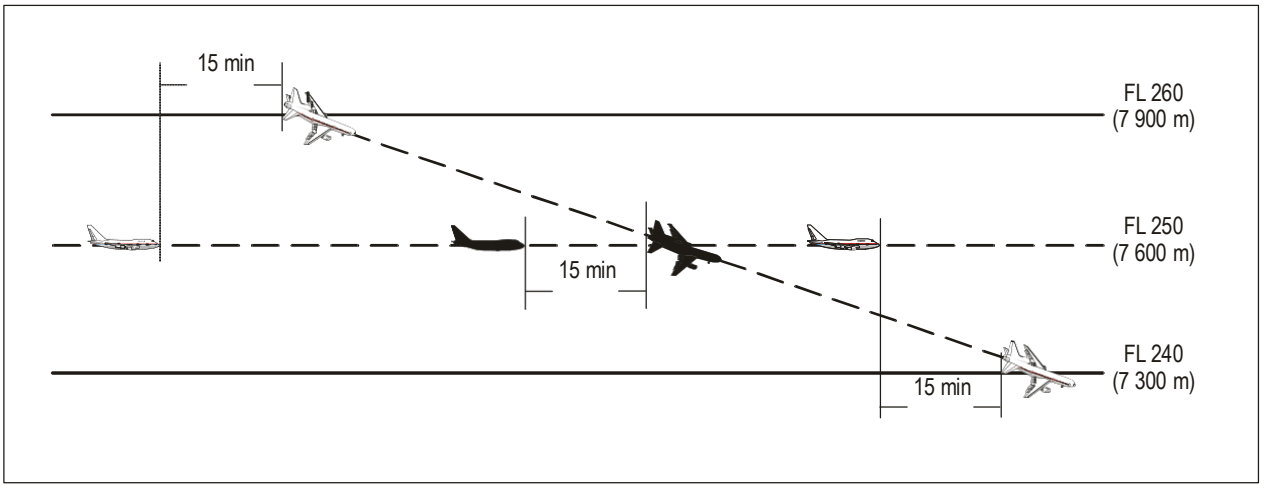


Figure 3-16B. Fifteen-minute separation between aircraft descending and on crossing tracks (See 3-7(4, a))

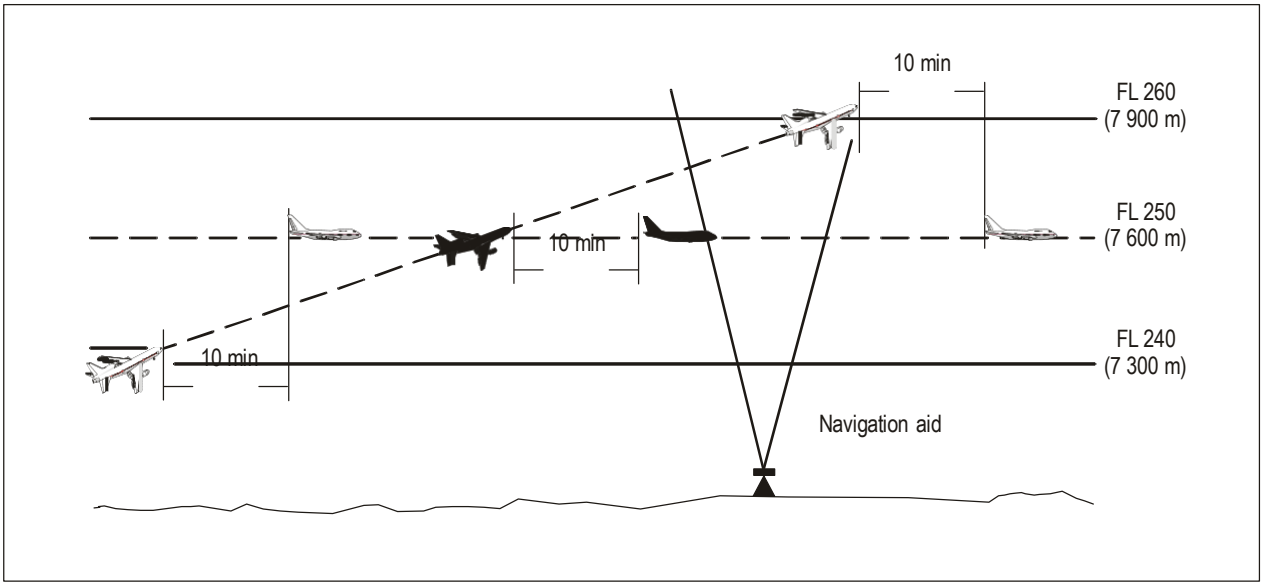


Figure 3-17A. Ten-minute separation between aircraft climbing and on crossing tracks (See 3-7(4, b))

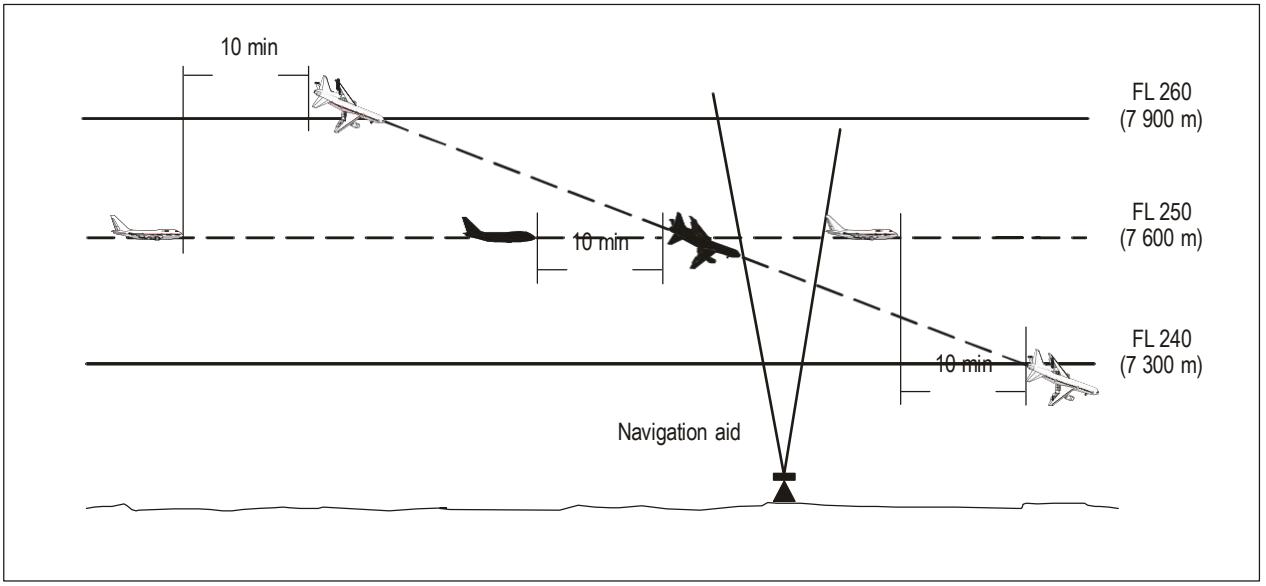


Figure 3-17B. Ten-minute separation between aircraft descending and on crossing tracks (See 3-7(4, b))

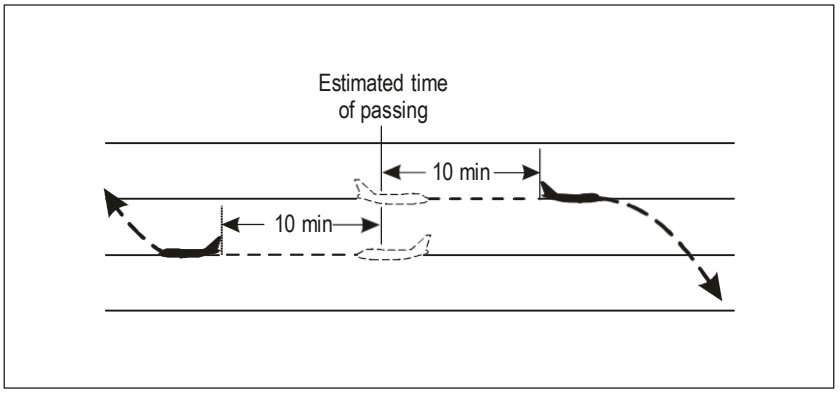


Figure 3-18. Ten-minute separation between aircraft on reciprocal tracks (See 3-7(5, a))

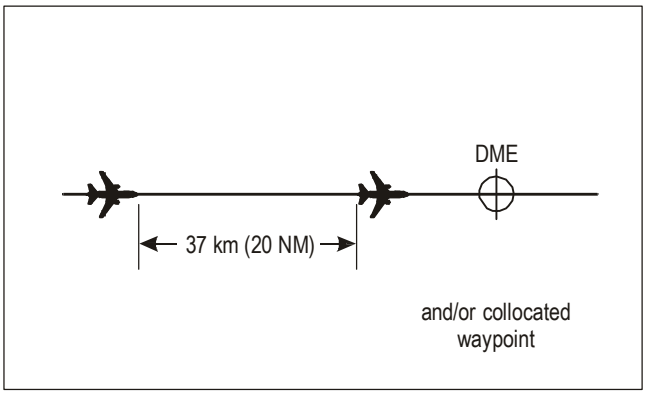


Figure 3-19. 37 km (20 NM) DME or GNSS-based separation between aircraft on same track and same level (See 3-8(2, b))

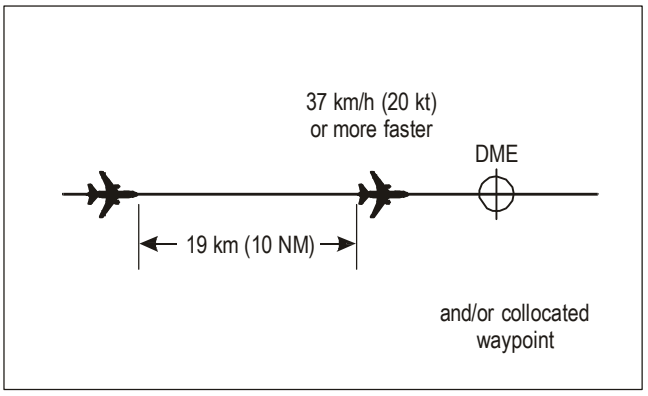


Figure 3-20. 19 km (10 NM) DME or GNSS-based separation between aircraft on same track and same level (See 3-8(2, c))

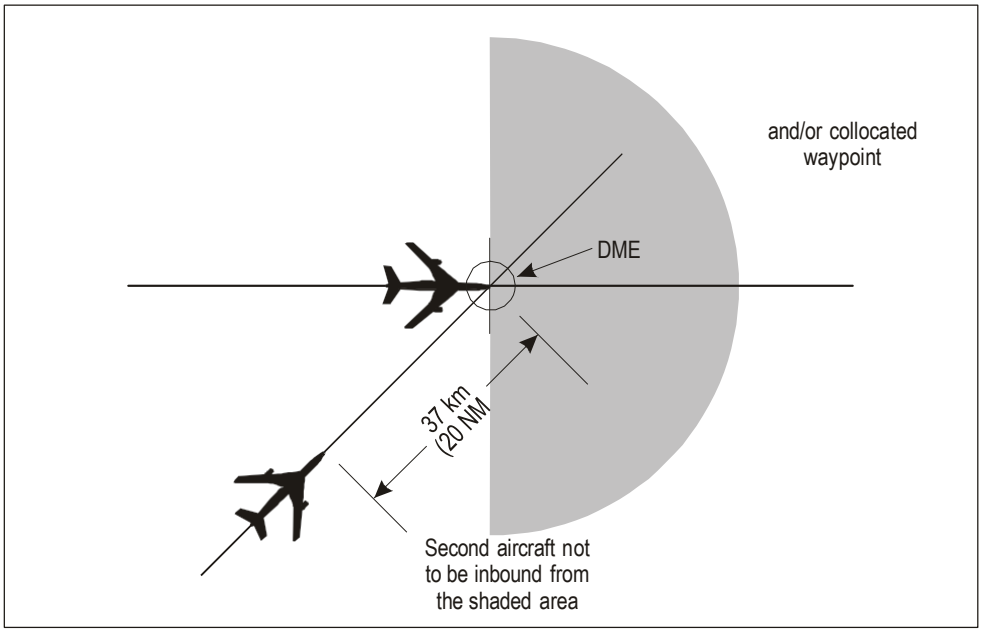


Figure 3-21A. 37 km (20 NM) DME or GNSS-based separation between aircraft on crossing tracks and same level (See 3-8(3))

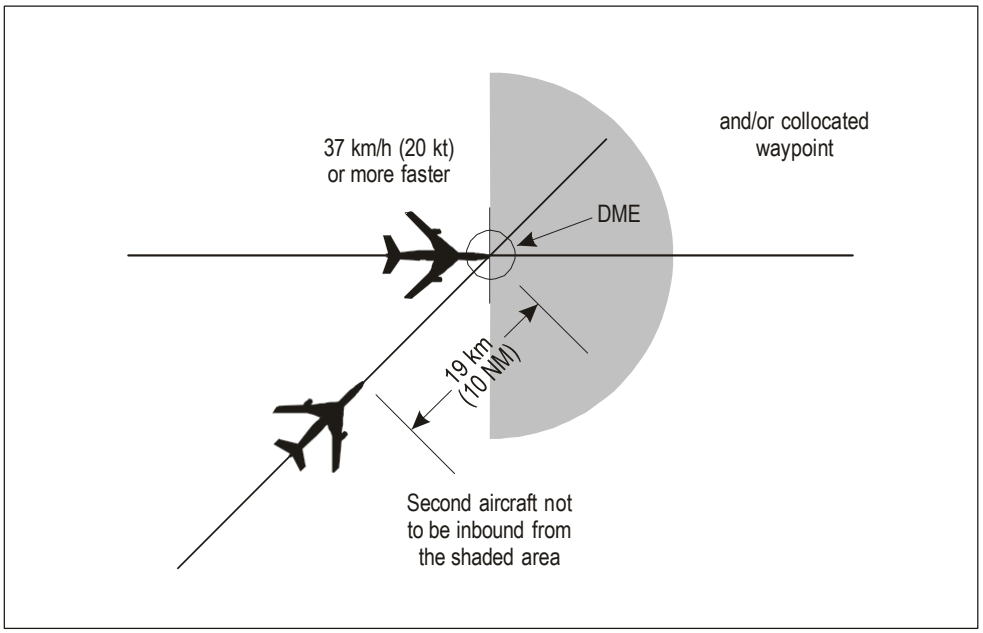


Figure 3-21B. 19 km (10 NM) DME or GNSS-based separation between aircraft on crossing tracks and same level (See 3-8(3))

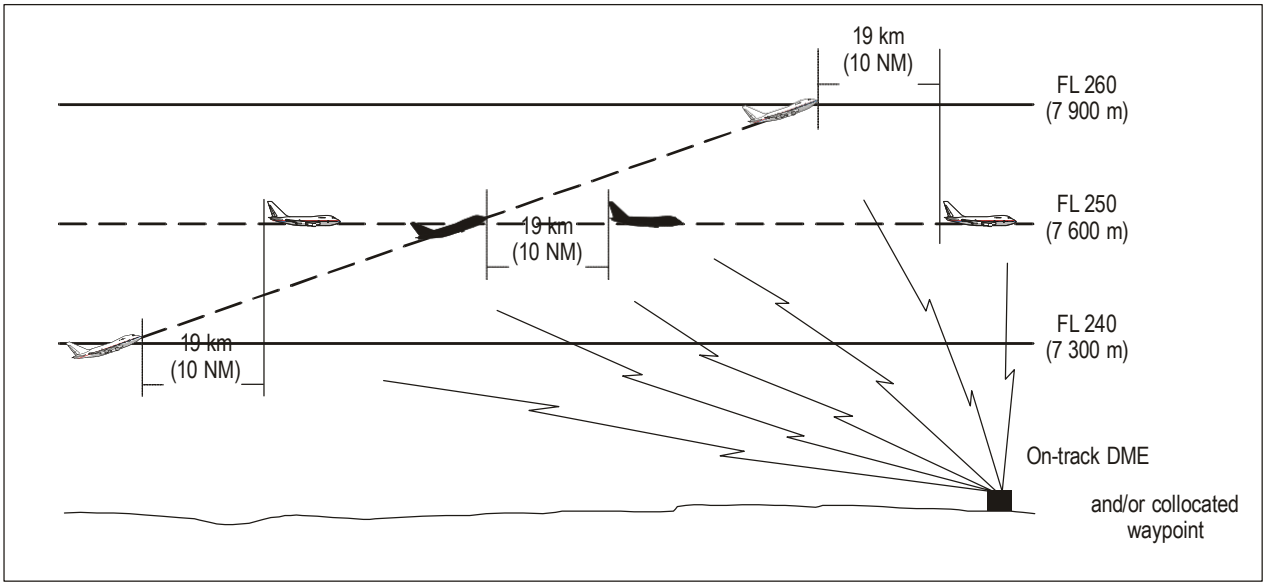


Figure 3-22A. 19 km (10 NM) DME or GNSS-based separation between aircraft climbing and on same track (See 3-8(4, c))

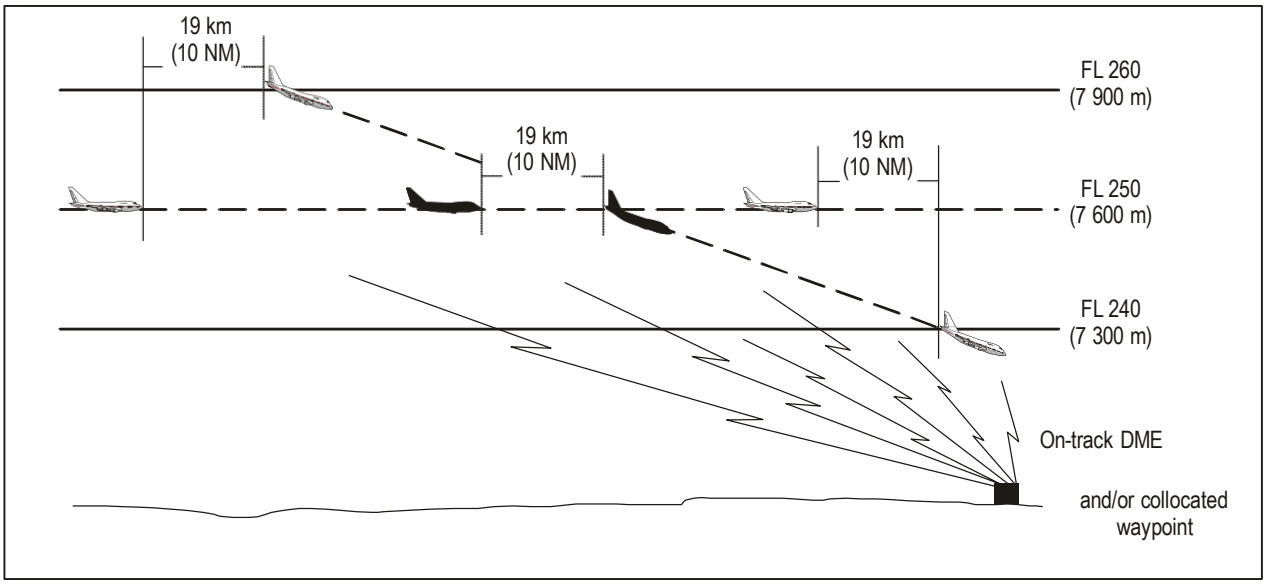


Figure 3-22B. 19 km (10 NM) DME or GNSS-based separation between aircraft descending and on same track (See 3-8(4, c))

3-9 SEPARATION OF AIRCRAFT HOLDING IN FLIGHT

1. Aircraft in adjacent holding patterns shall be separated vertically unless approved lateral separation has been established.

2. Except when lateral separation exists, vertical separation must be applied between holding aircraft and other departure, arriving, or en-route traffic when the aircraft are within 5 minutes flying time of the holding pattern .

3-10 MINIMUM SEPARATION BETWEEN DEPARTING AIRCRAFT

1. One-minute separation is required if aircraft are to fly on tracks diverging by at least45 degrees immediately after take-off so that lateral separation is provided (see Figure 3-23).

2. Two minutes are required between take-offs when the preceding aircraft is 74 km/h (40 kt) or faster than the following aircraft and both aircraft will follow the same track (see Figure 3-24).

3. Five-minute separation is required while vertical separation does not exist if a departing aircraft will be flown through the level of a preceding departing aircraft and both aircraft propose to follow the same track (see Figure 3-25). Action must be taken to ensure that the five-minute separation will be maintained or increased while vertical separation does not exist.

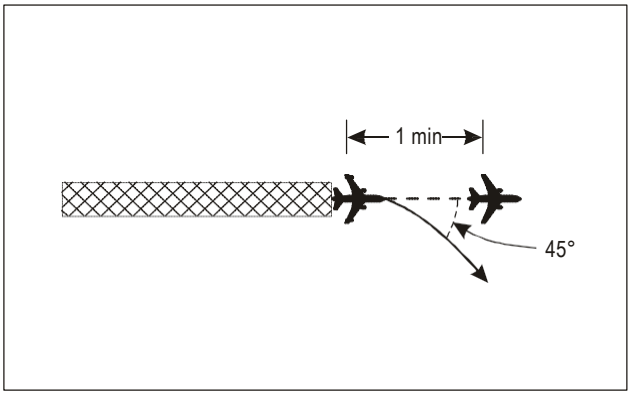


Figure 3-23. One-minute separation between departing aircraft following tracks diverging by at least 45 degrees (See 3-10(1))

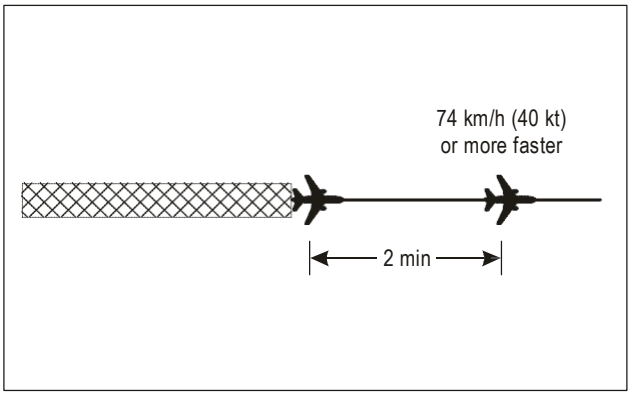


Figure 3-24. Two-minute separation between aircraft following same track (See 3-10(2))

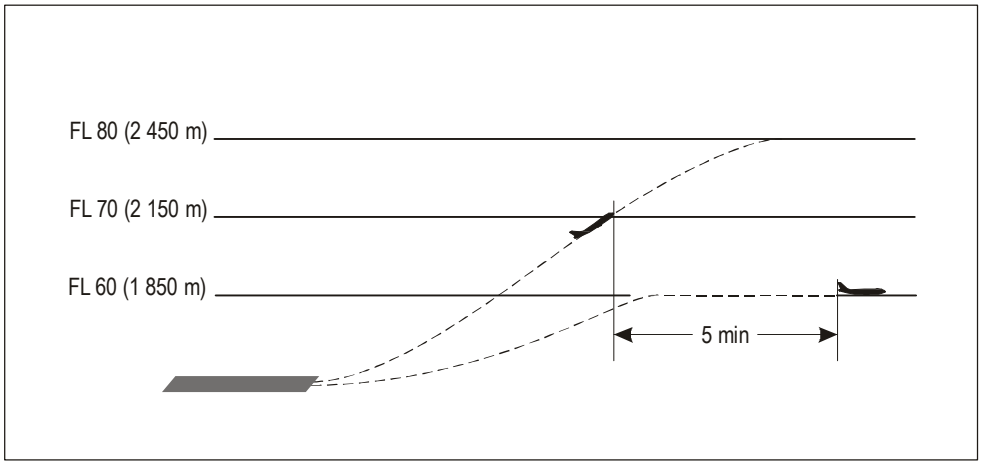


Figure 3-25. Five-minute separation of departing aircraft following same track (See 3-10(3))

Note 1: Wake Turbulence Categories are contained in Paragraph 2-4 of this directive.
Note 2**:** Except as prescribed by the appropriate ATS authority, a departing aircraft will not normally be permitted to commence take-off until the preceding departing aircraft has crossed the end of the runway-in-use or has started a turn or until all preceding landing aircraft are clear of the runway-in-use.
Note 3: Take-off clearance may be issued to an aircraft when there is reasonable assurance that separation as prescribed in the appropriate documents will exist when the aircraft commences take-off.
Note 4: Consider known aircraft performance characteristics when applying initial separation to successive departing aircraft.
Note 5: Extreme caution must be exercised by *all* ATCOs assigned to the Local Control's (LC's) position when permitting Category III aircraft to depart behind a Category I and Category II aircraft. (See Wake Turbulence Categories Paragraph 2-4).
Note 6: Calculations, based on True Airspeed (TAS), of speed differentials of aircraft during climb may not be sufficiently accurate in all circumstances for determining if the procedure can be applied; in which case calculations based on Indicated Air Speed (IAS) may be suitable.

3-11 SEPARATION OF DEPARTING AIRCRAFT FROM ARRIVING AIRCRAFT

1. The following minima shall apply when take-off clearance is based on the position of an arriving aircraft:

a. If an arriving aircraft is executing a full instrument approach a departing aircraft may take-off:

i. In any direction until the arriving aircraft has started its procedure turn or base turn leading to final approach.

ii. In a direction which is different by at least 45 degrees from the reciprocal of the direction of the approach after the arriving aircraft has started procedure turn or base turn leading to final approach, provided that the take-off will be made at least 3 minutes before the arriving aircraft is estimated to be over the beginning of the instrument runway. (See Figure 3-26)

b. If an arriving aircraft is making a straight-in approach a departing aircraft may take-off:

i. In any direction until 5 minutes before the arriving aircraft is estimated over the arrival runway.

ii. In a direction which is different by at least 45 degrees from the reciprocal of the direction of approach of the arriving aircraft until 3 minutes before the arriving aircraft is estimated to be over the beginning of the instrument runway. (See Figure 3-26)

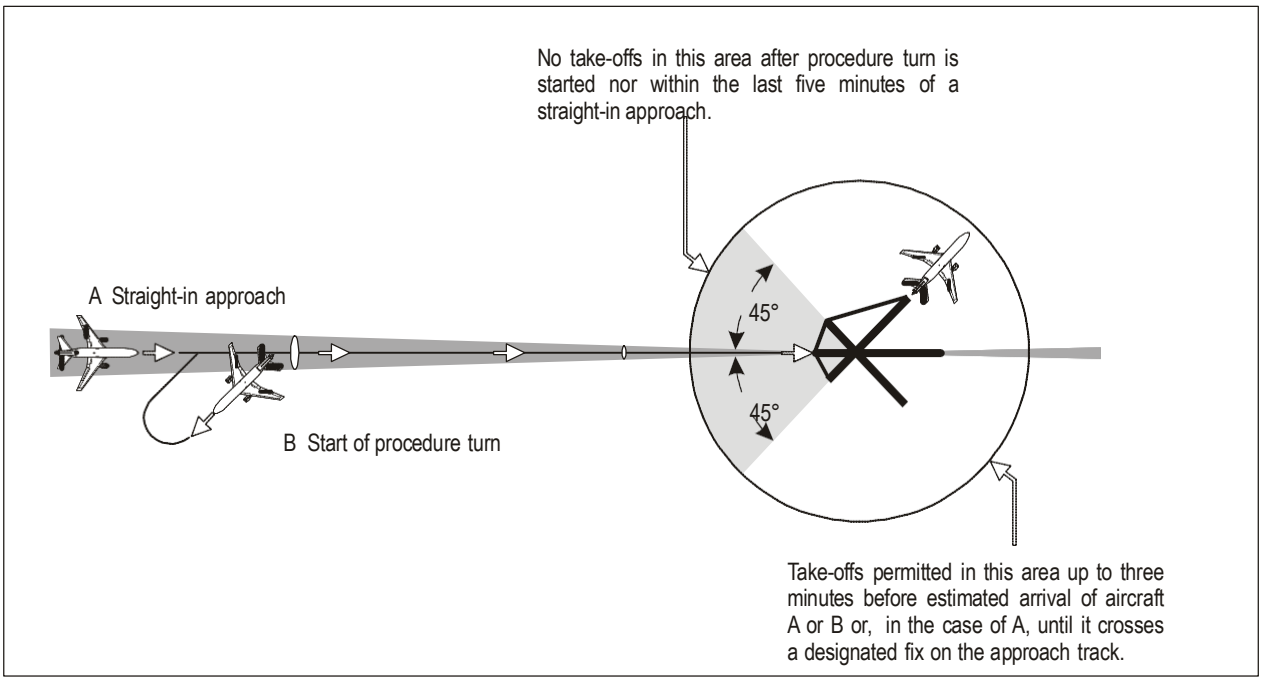


Figure 3-26. Separation of departing aircraft from arriving aircraft (See 3-11(1, a, ii)) and (See 3-11(1, b,ii))

3-12. WAKE TURBULENCE LONGITUDINAL SEPARATION CRITERIA BASED ON TIME

1. ATCO's shall not be required to apply wake turbulence separation:

a. For arriving VFR flights behind a landing heavy or medium aircraft; and

b. Between arriving VFR flights executing visual approaches when the aircraft behind has the preceding aircraft in sight and has been instructed to follow and maintain its own separation behind that aircraft.

Note 1. Wake Turbulence aircraft category criteria is contained in Paragraph 2-4 of this directive
Note 2. Distance based wake turbulence criteria is contained in Paragraph 5-36 of this directive

2. Wake turbulence separation minimum between arriving aircraft:

a. A medium aircraft behind a heavy aircraft, 2 minutes.

b. A light aircraft behind a medium or heavy aircraft, 3 minutes.

3. Wake turbulence separation minimum between departing aircraft:

a. A minimum separation of 2 minutes shall be applied between a light or medium aircraft taking off behind a heavy aircraft or a light aircraft taking off behind a medium aircraft when the aircraft are using (See Figures 3-27 and 3-28):

i. The same runway.

ii. Parallel runways separated by less than 2,500 feet.

iii. Crossing runways if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1,000 feet below.

iv. Parallel runways separated by 2,500 feet or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 1,000 feet below.

b. A minimum separation of 3 minutes shall be applied between a light or medium aircraft taking off behind a heavy aircraft or a light aircraft taking off behind a medium aircraft when the aircraft from:

i. An intermediate part of the same runway; or

ii. An intermediate part of a parallel runway separated by less than 2,500 feet. (See Figure 3-29)

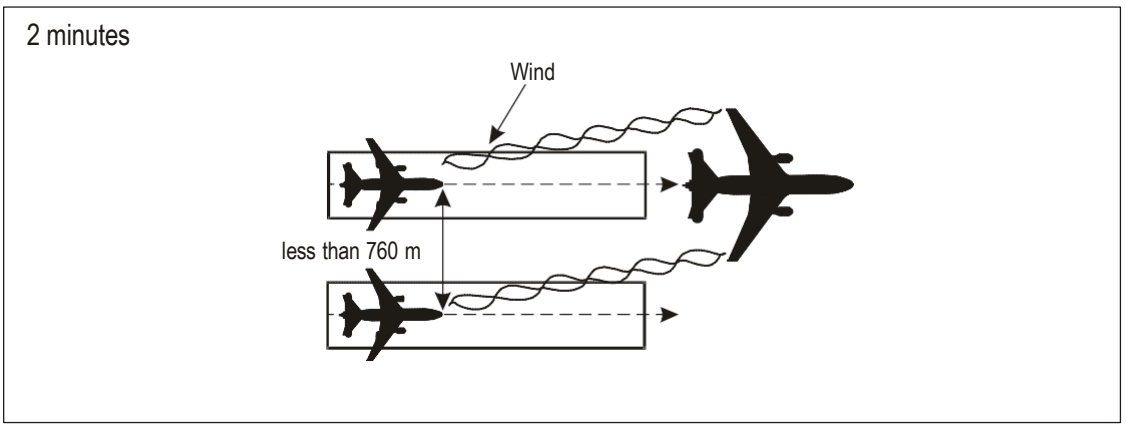


Figure 3-27. Two-minute separation for following aircraft (See 3-12(3, a))

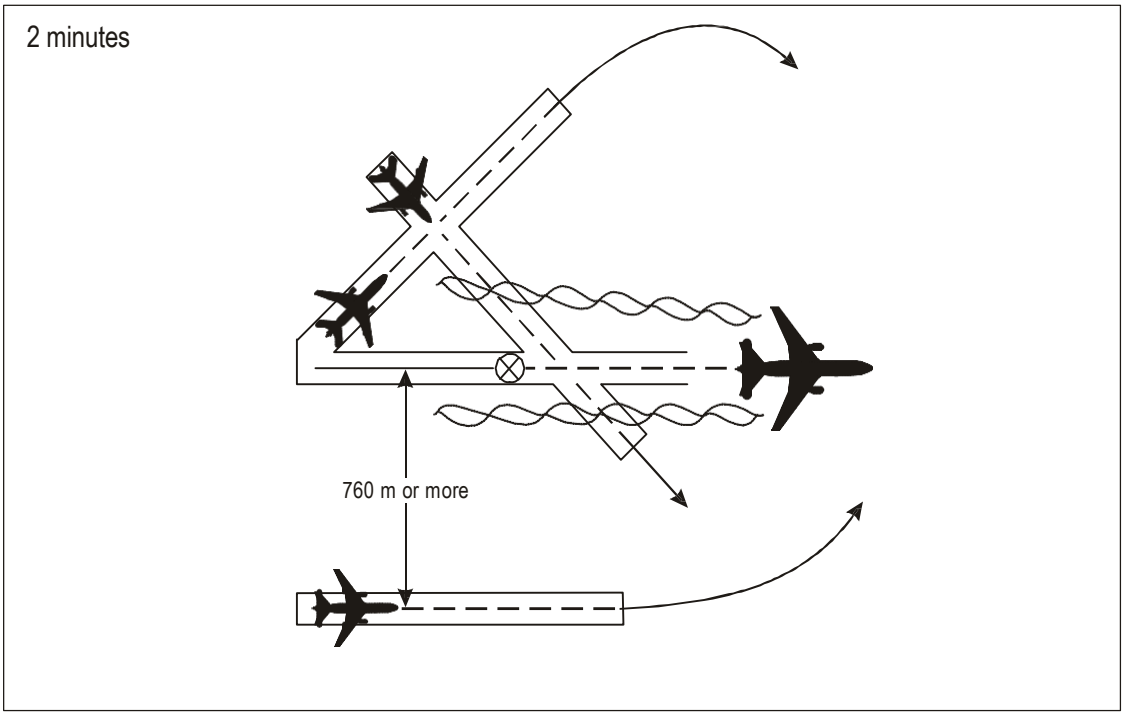


Figure 3-28. Two-minute wake turbulence separation for crossing aircraft (See 3-12(3, a))

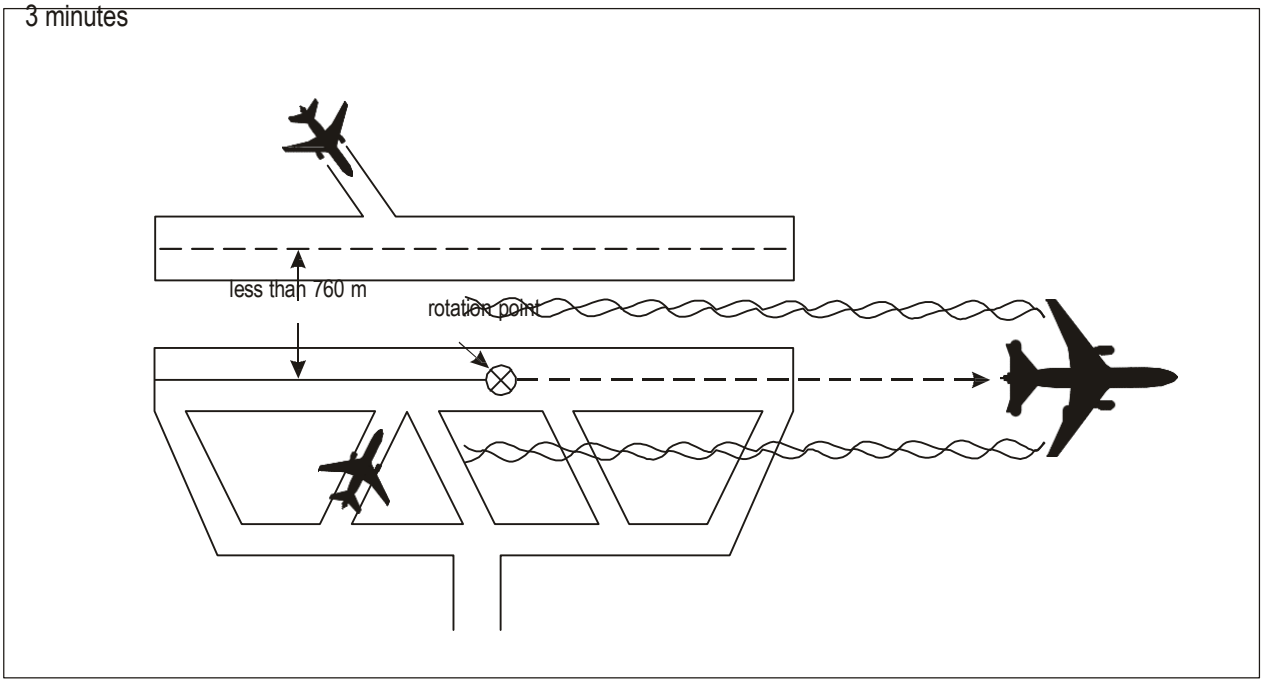


Figure 3-29. Three-minute wake turbulence separation for following aircraft (See 3-12(3, b))

4. Opposite direction wake turbulence separation minima:

a. A separation minimum of 2 minutes shall be applied between a LIGHT or MEDIUM aircraft and a HEAVY aircraft and between a LIGHT aircraft and a MEDIUM aircraft when the heavier aircraft is making a low or missed approach and the lighter aircraft is:

i. Utilizing an opposite-direction runway for take-off; or

ii. Landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760 m. (2 500 ft)

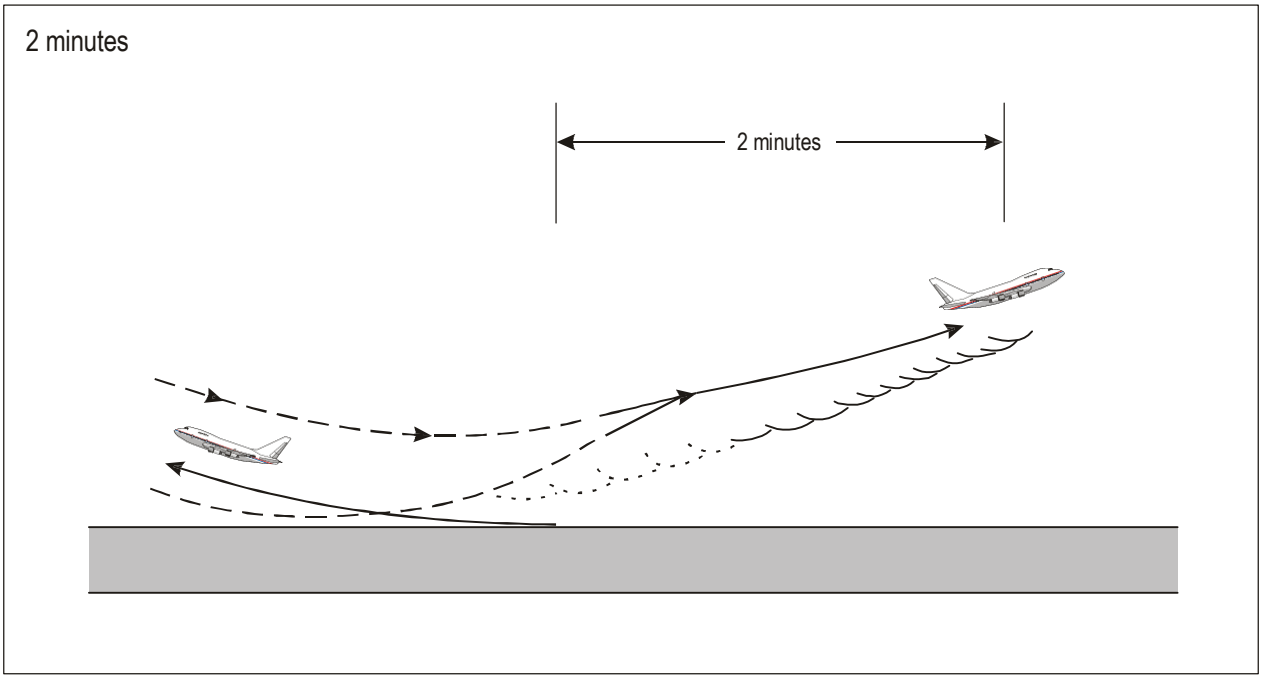


Figure 3-30. Two-minute wake turbulence separation for opposite-direction take-off (See 3-12(4, a, i))

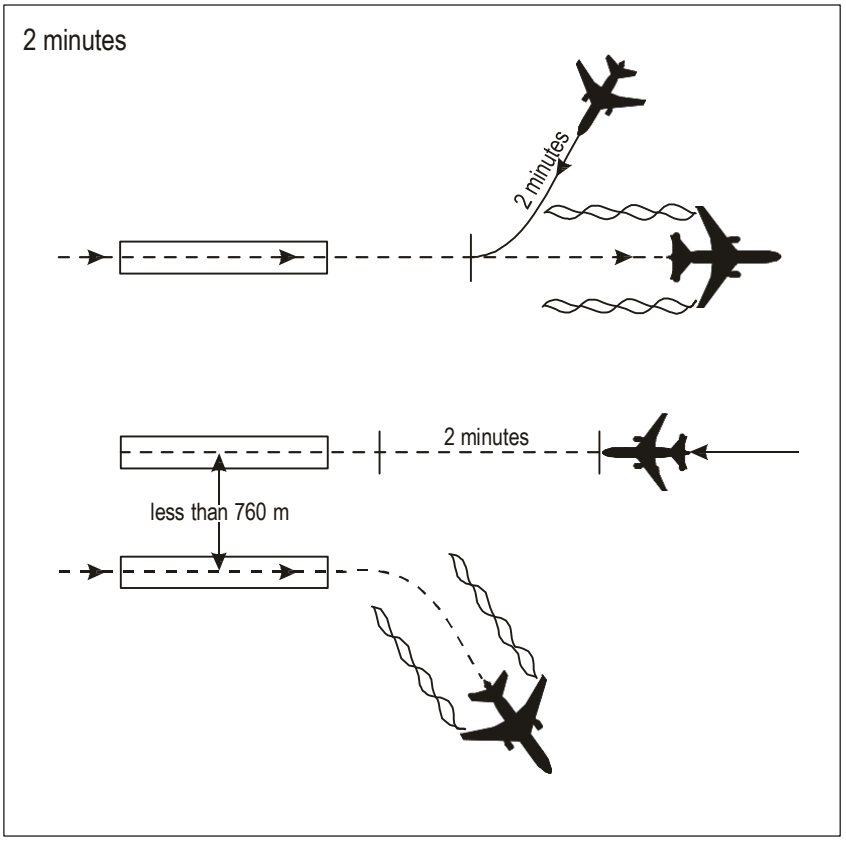


Figure 3-31. Two-minute wake turbulence separation for opposite-direction landing (See 3-12(4, a, ii))

3-13. VISUAL SEPARATION

ATCOs shall apply visual separation standards only within a terminal area when an ATCO has both aircraft in sight or by instructing a pilot who sees the other to maintain separation from it.

3-14. GEOGRAPHICAL SEPARATION

Geographical separation must be established by aircraft position reports over different geographical locations that have been specified as being separated and aircraft flight must be in a direction that is constant or increasing.

3-15 REDUCED SEPARATION

1. Provided an appropriate safety assessment has shown that an acceptable level of safety will be maintained, and after prior consultation with users, the separation minima detailed in this chapter may be reduced in the following circumstances: As determined by the appropriate ATS authority:

a. When special electronic or other aids enable the pilot-in-command of an aircraft to determine accurately the aircraft's position and when adequate communication facilities exist for that position to be transmitted without delay to the appropriate air traffic control unit; or

b. When, in association with rapid and reliable communication facilities, information of an aircraft's position, derived from an ATS surveillance system, is available to the appropriate air traffic control unit; or

c. When special electronic or other aids enable the air traffic controller to predict rapidly and accurately the flight paths of aircraft, and adequate facilities exist to verify frequently the actual aircraft positions with the predicted positions; or

d. When RNAV-equipped aircraft operate within the coverage of electronic aids that provide the necessary updates to maintain navigation accuracy.

2. In accordance with regional air navigation agreements when:

a. Special electronic, area navigation or other aids enable the aircraft to closely adhere to their current flight plans; and

b. The air traffic situation is such that the conditions in regarding communications between pilots and the appropriate ATC unit or units need not necessarily be met to the degree specified therein.

3. Departing Aircraft. A succeeding departing aircraft may commence its take-off if the following minimum distance exists between aircraft:

a. When only Category A aircraft are involved - 3,000 feet.

b. When either is a Category B aircraft - 4,500 feet; or

c. When either is a Category C aircraft - 6,000 feet.

d. Distance shall be determined by reference to suitable landmarks.

4. Landing Aircraft.

a. Aircraft may be cleared to land successively between sunrise and sunset:

i. When a Category A aircraft is landing behind a Category A or B aircraft - 3,000 feet.

ii. When a Category B aircraft is landing behind a Category A or B aircraft - 4,500 feet.

b. Aircraft may be cleared to land after a preceding aircraft has taken off:

i. When only Category A aircraft are involved - 3,000 feet.

ii. When either is a Category B aircraft - 4,500 feet; or

iii. When either is a Category C aircraft - 6,000 feet.

iv. Distances shall be determined by reference to suitable landmarks.

CHAPTER 4. CONTROL OF TRAFFIC

4-1. AIR TRAFFIC CONTROL CLEARANCES

1. A controlled flight shall be under the control of only one air traffic control unit at any given time.

2. An ATC clearance authorizes an aircraft to proceed under conditions specified by an ATC unit. Clearances are based solely on known traffic conditions and are required for any flight, or portion of a flight, which is provided with an ATC or advisory service. Such traffic conditions include not only aircraft in the air and on the maneuvering area over which control is being exercised, but also any vehicular traffic or other obstructions not permanently installed on the maneuvering area in use.

3. A pilot requests a clearance by submitting a flight plan. The clearance can be issued directly to the aircraft or through an approved agency, such as another ATSU.

4. Clearances do not constitute authority to violate any regulation established by the CAD, or other appropriate authority for promoting safety of flight operation or for any other purpose.

5. ATCOs should not issue clearances which imply permission to breach regulations.

6. An ATC departure clearance shall include the following items:

a. Aircraft identification.

b. Clearance limit.

c. Route; and

d. Altitude, altitude restrictions as appropriate, and expect final altitude time.

e. Any other pertinent information. (For example; communications instructions or time clearance expires).

4-2. CLEARANCE LIMIT

1. A clearance limit is the point to which an aircraft is granted an ATC clearance and shall be specified by naming:

a. An aerodrome.

b. A reporting point; or

c. A controlled or advisory airspace boundary.

2. An aircraft shall be cleared for the entire route to the aerodrome of first intended landing when:

a. It has planned to remain within controlled or advisory airspace throughout the flight; and

b. There is reasonable assurance that prior co-ordination will be affected ahead of the passage of the aircraft.

3. Every effort shall be made to clear aircraft according to the route requested. If this is not possible, the ATCO shall explain the reason when issuing the clearance. The expression "cleared flight plan route" is not to be used. If a pilot requests, or an ATCO offers, a direct routing, then the ATCO must inform the pilot if this direct route will take the aircraft outside the lateral or vertical boundaries of controlled or advisory airspace. The pilot will then decide whether to accept or decline the new route. The CAD may issue special instructions concerning the clearance of inbound aircraft to certain aerodromes.

4-3. AMENDMENTS TO CLEARANCES/FULL ROUTE CLEARANCE (FRC)

1. When an amendment is made to a clearance, the new clearance shall be read in full to the pilot and shall automatically cancel any previous clearance. The following procedure shall be followed prior to transmitting the clearance:

a. Inform the pilot of the error made regarding preferred routing.

b. Instruct the pilot to copy a FRC.

c. Request an acknowledgment for both "a" and "b"; and

d. Indicate by a checkmark acknowledging "a" above.

4-4. READBACK OF CLEARANCES

1. The ATCO shall ensure that the aircraft readback safety related parts of clearances and instructions that are given by voice as follows:

a. ATC route clearances.

b. Clearances and instructions to enter, land on, take off from, hold short of, cross, taxi, and backtrack on any runway; and

c. Runway-in-use, altimeter settings, SSR codes, altitude instructions, heading and speed instructions and, whether issued by the ATCO or ATIS, transition altitudes.

2. Other clearances or instructions including conditional clearances shall be readback in a manner that indicates they are clearly understood and will be executed by the aircraft.

3. The ATCO shall listen to the readback and make corrections as necessary.

4-5. HORIZONTAL SPEED CONTROL AND LIMITS

1. Aircraft should be given adequate notice of speed adjustments when practicable.

2. Speed adjustments shall not be issued to aircraft entering or established in a holding pattern.

3. Frequent changes of speed to aircraft should be avoided.

4. If aircraft are unable to comply with a speed instruction, the ATCO shall issue an alternative to ensure separation or spacing.

5. In assigning speeds for spacing to multiple aircraft specific speeds in knots shall be used.

6. An aircraft can be assigned a reduced speed to absorb part or all of a landing delay.

7. Assigned speeds below 250 knots (indicated airspeed) for turbojet aircraft above 10,000 feet should be applied with pilot concurrence.

8. Assigning an aircraft a reduced speed and high rate of descent should be avoided.

9. Speed control should not be applied to aircraft within 4 miles of the landing threshold on final approach.

10. When assigning speeds the following minima shall apply:

a. To aircraft operating between FL280 and 10,000 feet, a speed not less than 250 knots or the equivalent Mach number.

b. To arrival turbojet aircraft below 10,000 feet a speed not less than 210 knots, except when the aircraft is within 20 flying miles of the runway threshold of the aerodrome of intended landing, a speed not less than 170 knots.

c. To arrival reciprocating engine or turboprop aircraft, a speed not less than 200 knots, except when the aircraft is within 20 flying miles of the runway threshold of the aerodrome of intended landing, a speed not less than 150 knots.

d. To departure turbojet aircraft, a speed not less than 230 knots.

e. To departure reciprocating engine or turboprop aircraft, a speed not less than 150 knots.

f. To helicopters, a speed not less than 60 knots

11. In exceptional circumstances, a pilot may be asked to reduce to "minimum approach speed".

4-6. VERTICAL SPEED CONTROL

1. To ensure spacing or separation aircraft may be instructed to adjust their rate of climb or descent.

2. If aircraft are unable to comply with a rate of climb or descent instruction the ATCO shall issue an alternative to ensure separation or spacing.

3. Aircraft can be issued a specific rate of climb or a rate that is equal to or greater than a specific value or equal to or lesser than a specific value.

4. Aircraft may be issued a specific rate of descent or a rate that is equal to or greater than a specific value or equal to or lesser than a specific value.

5. Before issuing vertical speed control instructions the ATCO should ascertain what rates of climb or descent the aircraft can maintain.

4-7. AIRCRAFT POSITIONS REPORT

1. Aircraft shall report over or just passing significant or compulsory points along their route of flight.

2. If a report is not received at the expected time, ATCO's shall not use the estimated time for separation purposes but should obtain the report.

3. Position reports shall contain the following elements:

a. Aircraft Identification.

b. Position.

c. Time.

d. Altitude or Altitude passing/descending through if not in level flight.

e. Next position and estimate.

4-8. CLOSED AERODROMES

Information that an aerodrome abroad is closed is to be communicated to any aircraft in flight bound for that aerodrome.

4-9. DATA DISPLAY

Pertinent air traffic data is normally displayed on flight progress strips. Instructions for marking hand written strips appear in Appendix B.

4-10. FLIGHT PRIORITIES

1. Flight priority is as follows:

a. Aircraft who are landing due to factors that are effecting the safe operation of flight. (Emergencies, minimum fuel engine failure etc.)

b. Hospital aircraft; includes medevac.

c. Aircraft engaged in search and rescue operations.

d. Governor General, Prime Minister and Deputy Prime Minister.

e. Other aircraft as designated by CAD.

2. Minimum Fuel; ATCOs shall respond to pilots who indicate or suggest that they are becoming short of fuel or who have declared "MINIMUM FUEL" by asking the pilot to confirm whether or not he wishes to declare an emergency.

4-11. NOTIFICATION OF FLIGHTS

1. For flights within controlled airspace, a current flight plan, estimate, and control information shall be passed to the Miami Air Route Traffic Control Centre (ARTCC), sector, or unit in sufficient time to permit analysis prior to any co-ordination.

2. For flights within controlled airspace, a current flight plan shall be passed to the Grand Bahama Approach Control Unit, prior to departure.

4-12. ESTIMATE MESSAGES

1. The estimate message/flight progress strip shall contain the following information about an intended flight:

a. Aircraft identification and type.

b. Transponder Code.

c. Transfer point and ETA.

d. Altitude (requested and/or assigned).

e. Point of Departure.

f. Route; and

g. Destination and/or clearance limit.

2. Revisions to the message must be passed if:

a. There are any subsequent changes in Flight Level, Squawk, or route; or

b. The estimated time varies by 3 minutes or more.

4-13. TRANSFER OF AIRCRAFT CONTROL

1. Transfer of control is achieved when a flight, has reached the position or level agreed between the transferring and accepting units as the transfer of control point.

2. Transfer of control normally takes place:

a. At an agreed reporting point.

b. On an estimate for an FIR boundary.

c. At or passing an agreed level; or

d. While the aircraft is climbing or descending to a previously agreed level, provided that the transferring ATCO has ensured that standard separation will exist between the transferred aircraft and all others for the remainder of the climb or descent.

4-14. TRANSFER OF AIRCRAFT COMMUNICATION

1. Transfer of control must not be confused with transfer of communication. Transfer of communication may be permitted so that instructions, which become effective later, can be issued.

2. It is emphasised that an accepting ATC unit, which is in communication with an aircraft not having yet reached the stage of transfer of control, shall not alter the clearance without the approval of the transferring unit.

3. Transfer of communication should occur immediately after the next unit or position has agreed to assume control.

4. Aircraft can be authorized to leave frequency temporarily.

4-15. COORDINATION PROCEDURES

1. Traffic information passed between ATS personnel is information about aircraft that is relevant to the provision of an air traffic service. The purpose of traffic information is to enable the recipient to determine whether or not any action is necessary to achieve or maintain the required separation between the subject aircraft.

2. Coordination is effected when the parties concerned, on the basis of known intelligence, agree on a course of action. Responsibility for obtaining the agreement and for ensuring implementation of the agreed course of action may be vested in one of the ATCOs involved.

3. Coordination may be achieved by one of the following methods:

a. Tactical Coordination. The coordination of individual aircraft traffic situations between ATCO's. It is achieved either verbally, face-to-face or over a landline.

b. Standing Coordination. Coordination which is implemented automatically, on a permanent basis, without communication between the ATCOs involved. It is affected in accordance with a written agreement between the units or sectors involved.

c. When requesting co-ordination, an ATCO shall:

i. Refer to his aircraft and the aircraft upon which co-ordination is requested in the order most appropriate to the situation.

ii. Propose a course of action upon which agreement is requested and obtain a clear decision on that proposal. To ensure clarity and avoid misunderstandings, before terminating the call, parties shall explicitly state the action required of their aircraft to achieve the agreed course of action.

d. Where aircraft are climbing or descending, ATCOs may include the provision of horizontal separation until a flight profile is achieved that will provide adequate vertical separation with the conflicting traffic. Where combinations of horizontal and vertical separation are used in coordinating aircraft, ATCOs shall closely monitor aircraft tracks and levels to ensure that standard horizontal separation is maintained until the requisite vertical separation exists.

4. Instructions issued by ATCOs to pilots of aircraft operating outside controlled airspace are not mandatory; however, the services rely upon pilot compliance with the specified terms and conditions so as to promote a safer operating environment for all airspace users. The specific services have varying compliance requirements relating to the maintenance of headings, levels, time and radial allocations; consequently, the occasions when ATCOs may co-ordinate the aircraft without recourse to the pilot are detailed in the following paragraphs.

a. Basic Service. Unless the pilot has entered into an agreement with an ATCO to maintain a specific course of action, a pilot receiving a Basic Service may change level, heading, or route without advising the ATCO. Consequently, prior to such aircraft being coordinated in either the vertical or lateral planes, the following conditions shall be met:

i. The aircraft receiving the Basic Service is subject to identification, and it is expected that identity will be maintained throughout the period during which co-ordination is requested.

ii. The pilot receiving a Basic Service agrees to maintain the required vertical or lateral profile for the required period or distance.

iii. For maneuvering aircraft and aircraft following a route, co-ordination in the lateral plane may take place subject to the ATCO agreeing with the pilot the precise horizontal limits of the aircraft's maneuvers.

4-16. PENETRATION OF AIRSPACE/POINT-OUTS

Aircraft receiving an air traffic control service or advisory service from an ATC unit must not be permitted to penetrate the airspace of another unit unless prior co-ordination has taken place. The responsibility for initiating co-ordination rests with the ATCO of the unit transferring control. He must comply with any conditions specified by the accepting ATCO.

4-17. FORMATION FLIGHT PROCEDURES

1. Formation flights are to be considered as a single unit for separation/de-confliction purposes.

2. The callsign of the formation leader and the number of aircraft in the formation will be shown on flight plans. In making initial contact with the ATC unit, formation leaders should clearly state the number of aircraft in the formation; ATCOs are to ensure that this information is obtained prior to providing air traffic service.

3. All ATC instructions and clearances shall be addressed to the formation leader except when landing or taking off.

4. During all co-ordination, traffic information and handoff messages, ATCOs shall clearly state the number of aircraft in a formation.

5. When a formation has been cleared to climb or descend in Controlled Airspace (CAS), controllers are to obtain confirmation that all elements of the formation have vacated the level in question before ATC re-allocate the previously assigned level. Formation leaders should confirm when all formation elements have reached the new assigned level.

6. The formation leader will immediately inform ATC if the formation elements are unable to maintain within the required parameters as specified in this directive. In such circumstances, ATCOs shall establish the extent of the formation so that instructions and/or information appropriate to the airspace classification and flight rules of the formation can be provided. When necessary, additional discrete SSR codes should be allocated to individual aircraft.

7. For IFR formations that are unable to maintain within the required parameters, the formation leader remains responsible for separation between aircraft comprising the formation until standard separation has been achieved between individual aircraft and each aircraft has been identified and placed under service. Additionally, ATCOs shall:

a. Provide other IFR traffic with essential traffic information and instructions as necessary.

b. If practicable, establish standard separation minima between all aircraft in the formation as soon as possible, using ATS surveillance systems if available. If normal separation minima cannot be established, the aircraft shall be given as much separation from each other as possible and the formation given directions to enable it to leave controlled airspace by the shortest possible route.

8. ATCO's shall only permit an IFR formation under their direct control to join up in controlled airspace when one of the aircraft is in emergency and a formation join up is essential.

4-18. BALLOONS, KITES AND PARACHUTES FLIGHTS IN CONTROLLED AIRSPACE

Balloons, Kites and Parachutes are regulated by Bahamas Air Navigation Safety Regulations. ATCO's are encouraged to notify the watch supervisor when advised of a proposed balloon flight if unsure of the correct regulation to be administered.

4-19. AIRCRAFT DIVERSION PROCEDURES

1. Aircraft may divert from their planned destination to another aerodrome on the initiative of the pilot or as requested by the appropriate authority on the ground.

2. The Aerodrome Operator is responsible for decisions regarding the availability of the aerodrome. (In the Bahamas CAD functions as the Aerodrome Operator)

3. Aircraft Diversions Originated by the Pilot:

a. The pilot of an aircraft is primarily responsible for its safety; therefore he will normally decide whether he can or cannot affect a safe landing at a given aerodrome. He will normally be aware of weather conditions at his planned destination and alternate aerodromes, thus whenever he considers a diversion to be necessary, he will make his intention known to an ATC unit and request further clearance. His decision will normally be in accordance with the minima prescribed by his company.

b. When specifically requested by the pilot that his company or a nominated addressee be advised of his diversion the ATCO is to pass this message to the ATSU at either:

i. The original destination.

ii. The aerodrome nearest to the original destination; or

iii. An ATSU receiving such a message is to pass it to the addressee.

4. Aircraft Diversions Originated by ATS:

a. When, for traffic reasons, an ATCO considers it advisable to divert an aircraft, he shall consult the Aircraft Operator. The ATCO and the aircraft operator shall decide between them the diversion aerodrome. The request to divert shall be passed to the pilot together with reasons for diversion, an ATC clearance, and any further instructions.

b. In cases of emergency, it may be necessary for an aircraft to be diverted without prior consultation with the Aircraft Operator. In this event, the ATCO shall pass the message to the pilot expressed as a request and inform the Aircraft Operator as soon as possible. When the operator of the aircraft is not known, the pilot is to be asked to nominate an addressee.

c. On receipt of the diversion message, the pilot will acknowledge and comply with the request or give his reason for non-compliance. If he decides against diversion, permission to attempt a landing shall not be refused unless the aerodrome has been closed by the Aerodrome Operator.

CHAPTER 5. RADAR

5-1. PRESENTATION AND EQUIPMENT PERFORMANCE

Provide radar service only if you are personally satisfied that the radar presentation and equipment performance is adequate for the service being provided.

5-2. ALIGNMENT AND ACCURACY CHECK

During relief briefing, or as soon as possible after assuming responsibility for a control position, check the operating equipment for alignment accuracy and display acceptability. Recheck periodically throughout the watch.

1. Check the alignment of the radar video display by assuring that the video/digital map or overlay is properly aligned with a permanent target of known range and azimuth on the radar display. Where possible, check one permanent target per quadrant.

2. Accuracy of the radar video display must be verified for digitized radar systems by using the moving target indicator (MTI) reflectors, fixed location beacon transponders (Parrots), beacon real−time quality control (RTQC) symbols or calibration performance monitor equipment (CPME) beacon targets.

5-3. RADAR USE

Use radar information derived from primary and secondary radar systems.

1. Secondary radar may be used as the sole display source as follows:

a. In Class A airspace.

b. Outside Class A airspace, or where mix of Class A airspace/non−Class A airspace exists, only when:

i. Additional coverage is provided by secondary radar beyond that of the primary radar; or

ii. The primary radar is temporarily unusable or out of service. Advise pilots when these conditions exist.

Phraseology−
Primary radar unavailable (describe location). Radar services available on transponder equipped aircraft only.

NOTE−1. Advisory may be omitted when provided on ATIS and pilot indicates having ATIS information.

Note 2. This provision is to authorize secondary radar only operations where there is no primary radar available and the condition is temporary.

2. Do not use secondary radar only to conduct surveillance (ASR) final approaches unless an emergency exists and the pilot concurs.

3. A secondary radar system is the only source of radar data for the area of service. When the system is used for separation, beacon range accuracy is assured, as provided in paragraph 5-4, Beacon Range Accuracy. Advise pilots when these conditions exist.

NOTE− Advisory may be omitted when provided on ATIS or by other appropriate notice to pilots.

5-4. BEACON RANGE ACCURACY

1. You may use beacon targets for separation purposes if beacon range accuracy is verified by one of the following methods:

NOTE−1. The check for verification of beacon range accuracy accomplished by correlation of beacon and primary radar targets of the same aircraft is not a check of display accuracy. Therefore, it is not necessary that it be done using the same display with which separation is being provided, nor the same targets being separated.

NOTE-2. Narrowband and Full Digital Automation Systems: Technical operations personnel verify beacon range accuracy for automated narrowband display equipment and Full Digital Terminal Automation Systems. Consequently, further verification by the controller is unnecessary.

a. Correlate beacon and primary targets of the same aircraft (not necessarily the one being provided separation) to assure that they coincide.

b. When beacon and primary targets of the same aircraft do not coincide, correlate them to assure that any beacon displacement agrees with the specified distance and direction for that particular radar system.

c. Refer to beacon range monitoring equipment where so installed.

2. If beacon range accuracy cannot be verified, you may use beacon targets only for traffic information.

5-5. SERVICE LIMITATIONS

1. When radar mapping is not available, limit radar services to:

a. Separating identified aircraft targets.

b. Providing radar service in areas that ensure no confliction with traffic on airways, other ATC areas of jurisdiction, restricted or prohibited areas, terrain, etc.

2. Report radar malfunctions immediately for corrective action and for dispatch of a Notice to Airmen. Advise adjacent ATC facilities when appropriate.

5-6. ELECTRONIC CURSOR

1. An electronic cursor may be used to aid in identifying and vectoring an aircraft and to give finer delineation to a video map. Do not use it as a substitute for a video map or map overlay; e.g., to form intersections, airway boundaries, final approach courses, etc.

2. Fixed electronic cursors may be used to form the final approach course for surveillance approaches conducted by military operated mobile radar facilities.

5-7. MERGING TARGET PROCEDURES

1. Except while they are established in a holding pattern, apply merging target procedures to all radar identified:

a. Aircraft at 10,000 feet and above.

b. Turbojet aircraft regardless of altitude.

c. Governor General, Prime Minister/Deputy Prime Minister aircraft regardless of altitude.

2. Issue traffic information to those aircraft listed in subparagraph a. whose targets appear likely to merge unless the aircraft are separated by more than the appropriate vertical separation minima.

Phraseology;

"Traffic twelve o'clock, seven miles, eastbound, MD−80, at seven thousand."

"Bahamas two forty two and American Twenty-five, traffic twelve o'clock, one zero miles, opposite direction, eastbound seven thirty seven at one two thousand, westbound MD−Eighty at one one thousand."

3. If the pilot requests, vector his/her aircraft to avoid merging with the target of previously issued traffic.

> NOTE−Aircraft closure rates are so rapid that when applying merging target procedures, controller issuance of traffic must be commenced in ample time for the pilot to decide if a vector is necessary.

5-8. HOLDING PATTERN SURVEILLANCE

Provide radar surveillance of outer fix holding pattern airspace areas, or any portions thereof, shown on your radar scope (displayed on the video map or scribed on the map overlay) whenever aircraft are holding there. Attempt to detect any aircraft that stray outside the area. If you detect an aircraft straying outside the area, assist it to return to the assigned airspace.

5-9. DEVIATION ADVISORIES

Inform an aircraft when it is observed in a position and on a track which will obviously cause the aircraft to deviate from its protected airspace area. If necessary, assist the aircraft to return to the assigned protected airspace.

5-10. POSITION REPORTING

If necessary, you may request an aircraft to provide an estimate or report over a specific fix. After an aircraft receives the statement "radar contact" from ATC, it discontinues reporting over compulsory reporting points. It resumes normal position reporting when ATC informs it "radar contact lost" or "radar service terminated." When required, inform an aircraft of its position with respect to a fix or airway.

Phraseology − OVER/PASSING (fix).

(Number of miles) MILES FROM (fix).

(Number of miles) MILES (direction) OF (fix, airway, or location).

CROSSING/JOINING/DEPARTING (airway or route).

INTERCEPTING/CROSSING (name of NAVAI D) (specified) RADIAL.

5-11. RADAR SERVICE TERMINATED

1. Inform aircraft when radar service is terminated.

Phraseology −

RADAR SERVICE TERMINATED (non-radar routing if required).

2. Radar service is automatically terminated and the aircraft needs not be advised of termination when:

a. An aircraft cancels its IFR flight plan except where basic radar service is provided.

b. An aircraft conducting an instrument, visual, or contact approach has landed or has been instructed to change to advisory frequency.

c. At tower-controlled aerodromes where radar coverage does not exist to within 1/2 mile of the end of the runway, arriving aircraft must be informed when radar service is terminated.

d. An arriving VFR aircraft receiving radar service to a tower-controlled aerodrome or where basic radar service is provided has landed, or to all other aerodromes, is instructed to change to tower or advisory frequency.

e. An aircraft completes a radar approach.

5-12. BEACON CODE ASSIGNMENT CRITERIA AND USE

1. General.

a. Mode 3/A is designated as the common military/civil mode for air traffic control use.

b. Make radar beacon code assignments to only Mode 3/A transponder-equipped aircraft.

2. Unless otherwise specified in a directive or a letter of agreement, make code assignments to departing, en route, and arrival aircraft in accordance with the procedures specified in this section for the radar beacon code environment in which you are providing ATC service. Give first preference to the use of discrete beacon codes.

Phraseology
SQUAWK THREE/ALFA (code), or

SQUAWK (code).

NOTE−A code environment is determined by an operating position's/sector's equipment capability to decode radar beacon targets using either the first and second or all four digits of a beacon code.

3. Discrete Environment.

a. Issue discrete beacon codes assigned by the computer. Computer-assigned codes may be modified as required.

b. Make handoffs to other positions/sectors on the computer-assigned code.

4. Non-Discrete Environment.

a. Assign appropriate non-discrete beacon codes from the function codes specified in sub-paragraph g, Function Code Assignments.

b. Unless otherwise coordinated at the time of handoff, make handoffs to other positions/sectors on an appropriate non-discrete function code.

5. Mixed Environment.

a. When discrete beacon code capability does not exist in your area of responsibility, comply with the procedures specified in sub-paragraph d, non-discrete Environment.

NOTE−In a mixed code environment, a situation may exist where a discrete-equipped position/sector exchanges control of aircraft with non-discrete-equipped facilities or vice versa.

b. When discrete beacon code capability exists in your area of responsibility:

i. Comply with the procedures specified in sub-paragraph c, Discrete Environment; and

ii. Unless otherwise coordinated at the time of handoff, assign aircraft that will enter the area of responsibility of a non-discrete-equipped position/ sector an appropriate non-discrete function code from the codes specified in sub-paragraph g, Function Code Assignments, prior to initiating a handoff.

6. Radar Beacon Code Changes.

Unless otherwise specified in a directive or a letter of agreement or coordinated at the time of handoff, do not request an aircraft to change from the code it was squawking in the transferring unit's area until the aircraft is within your area of responsibility unless necessary. Beacon code changes should be kept to a minimum.

7. CAD Beacon Code Assignment Plan.

a. ATCOs are to assign ARTS IIA generated transponder codes or Miami Centre assigned codes to all aircraft as appropriate. Aircraft that will remain within Nassau controlled airspace shall be assigned codes from the following code subsets:

i. IFR/SVFR/Arrivals	0101 – 0177
ii. IFR/SVFR/VFR/Departures	0201 – 0277
iii. IFR Overflights.	0301 – 0377
iv. VFR Arrivals/Overflights	0401 – 0477

Note: When radar service is terminated, aircraft must be returned to the appropriate beacon code; e.g., 1200 for VFR.

b. When discrete code capability is available at Miami Centre and Nassau Centre, use the beacon code assigned by the Miami Centre.

c. When discrete code capability is not available at Miami Centre and Nassau Centre, make beacon code assignments in accordance with this directive and Letters of Agreement.

5-13. EMERGENCY CODE ASSIGNMENT

Assign Codes to Emergency Aircraft as Follows:

1. Code 7700 when the pilot declares an emergency and the aircraft is not radar identified.

PHRASEOLOGY−

SQUAWK MAYDAY ON 7700.

2. After radio and radar contact have been established, you may request other than single-piloted helicopters and single-piloted turbojet aircraft to change from **Code 7700** to another code appropriate for your radar beacon code environment.

Note 1.The code change, based on pilot concurrence, the nature of the emergency, and current flight conditions will signify to other radar facilities that the aircraft in distress is identified and under ATC control.

Note 2.Pilots of single-piloted helicopters and single-piloted turbojet aircraft may be unable to reposition transponder controls during the emergency.

PHRASEOLOGY−
RADAR CONTACT (position). IF FEASIBLE, SQUAWK (code).

3. The following must be accomplished on a Mode C equipped VFR aircraft which is in emergency but no longer requires the assignment of Code 7700, Assign a beacon code that will permit terminal minimum safe altitude warning (MSAW) alarm processing.

5-14. RADIO FAILURE

When you observe a Code 7600 display, apply the procedures in paragraph 8-8, Radio Failure.

NOTE−Should a transponder-equipped aircraft experience a loss of two-way radio communications capability, the pilot can be expected to adjust his/her transponder to Code 7600.

5-15. VFR CODE ASSIGNMENTS

For VFR aircraft receiving radar advisories, assign an appropriate function code or computer-assigned code for the code environment in which you are providing service.

1. If the aircraft is outside of your area of responsibility and an operational benefit will be gained by retaining the aircraft on your frequency for the purpose of providing services, ensure that coordination has been effected:

a. As soon as possible after positive identification; and

b. Prior to issuing a control instruction or providing a service other than a safety alert/traffic advisory.

NOTE− Safety alerts/traffic advisories may be issued to an aircraft prior to coordination if an imminent situation may be averted by such action. Coordination should be effected as soon as possible thereafter.

2. Instruct IFR aircraft which cancel an IFR flight plan and are not requesting radar advisory service and VFR aircraft for which radar advisory service is being terminated to squawk the VFR code.

PHRASEOLOGY− SQUAWK VFR.

O r

SQUAWK 1200.

3. When an aircraft changes from VFR to IFR, the controller must assign a beacon code to Mode C equipped aircraft that will allow MSAW alarms.

5-16. STANDBY OPERATION

You may instruct an aircraft operating on an assigned code to change transponder to "standby" position:

1. When approximately 15 miles from its destination and you no longer desire operation of the transponder.

2. When necessary to reduce clutter in a multi-target area, or to reduce “ring-around” or other phenomena, provided you instruct the aircraft to return to “normal sensitivity” position as soon as possible thereafter.

PHRASEOLOGY− SQUAWK STANDBY,

O r

SQUAWK NORMAL.

5-17. CODE MONITOR

Continuously monitor the Mode 3/A radar beacon codes assigned for use by aircraft operating within your area of responsibility when non-automated beacon decoding equipment (e.g., 10−channel decoder) is used to display the target symbol.

1. This includes the appropriate IFR code actually assigned and, additionally, Code 1200, Code 1255, and Code 1277 unless your area of responsibility includes only Class A airspace. During periods when ring-around or excessive VFR target presentations derogate the separation of IFR traffic, the monitoring of VFR Code 1200, Code 1255, and Code 1277 may be temporarily discontinued.

2. Positions of operation which contain a restricted or warning area within or immediately adjacent to their area of jurisdiction must monitor Code 4000 and any other code used in lieu of 4000 within the warning/restricted area. If by local coordination with the restricted/warning area a code other than 4000 is to be exclusively used, then this code must be monitored.

3. If a normally assigned beacon code disappears, check for a response on the following codes in the order listed and take appropriate action:

> NOTE− When Codes 7500 and/or 7600 have been preselected, it will be necessary for the ID−SEL−OFF switches for these codes to be left in the off position so that beacon target for an aircraft changing to one of these codes will disappear, thereby alerting the controller to make the check. This check will not be required if automatic alerting capability exists.

a. Code 7500 (hijack code).

b. Code 7600 (loss of radio communications code).

5-18. FAILURE TO DISPLAY ASSIGNED BEACON CODE OR INOPERATIVE/ MALFUNCTIONING TRANSPONDER AND INTERROGATOR MALFUNCTION

1. Inform an aircraft with an operable transponder that the assigned beacon code is not being displayed.

PHRASEOLOGY−
(Identification) RESET TRANSPONDER, SQUAWK (appropriate code).

2. Inform an aircraft when its transponder appears to be inoperative or malfunctioning.

PHRASEOLOGY−
(Identification) YOUR TRANSPONDER APPEARS INOPERATIVE/MALFUNCTIONING, RESET, and SQUAWK (appropriate code).

3. Ensure that the subsequent control position in the unit or the next unit, as applicable, is notified when an aircraft transponder is malfunctioning/inoperative.

4. Inform aircraft concerned when the ground interrogator appears to be inoperative or malfunctioning.

PHRASEOLOGY−
(Name of unit or control function) BEACON INTERROGATOR INOPERATIVE/MALFUNCTIONING.

5-19. VALIDATION OF MODE C READOUT

Ensure that Mode C altitude readouts are valid after accepting an inter-unit handoff, initial track start, track start from coast/suspend tabular list, missing, or unreasonable Mode C readouts.

1. Consider altitude readout valid when:

a. It varies less than 300 feet from the pilot reported altitude; or

PHRASEOLOGY−
(If aircraft is known to be operating below the lowest useable flight level),

SAY ALTITUDE. or
(If aircraft is known to be operating at or above the lowest useable flight level),

SAY FLIGHT LEVEL.

b. You receive a continuous readout from an aircraft on the aerodrome and the readout varies by less than 300 feet from the field elevation; or

NOTE−A continuous readout exists only when the altitude filter limits are set to include the field elevation.

c. You have correlated the altitude information in your data block with the validated information in a data block generated in another unit (by verbally coordinating with the other controller) and your readout is exactly the same as the readout in the other data block.

2. When unable to validate the readout, do not use the Mode C altitude information for separation.

3. Whenever you observe an invalid Mode C readout below FL 180:

a. Issue the correct altimeter setting and confirm the pilot has accurately reported the altitude.

PHRASEOLOGY−
(Location) ALTIMETER (appropriate altimeter), VERIFY ALTITUDE.

b. If the altitude readout continues to be invalid:

i. Instruct the pilot to turn off the altitude-reporting part of his/her transponder and include the reason; and

ii. Notify the operations supervisor-in-charge of the aircraft call sign.

PHRASEOLOGY−
STOP ALTITUDE SQUAWK. ALTITUDE DIFFERS BY (number of feet) FEET.

4. Whenever possible, inhibit altitude readouts on all consoles when a malfunction of the ground equipment causes repeated invalid readouts.

5-20. ALTITUDE CONFIRMATION-MODE C

Request a pilot to confirm assigned altitude on initial contact unless:

1. The pilot states the assigned altitude;

2. You assign a new altitude to a climbing or a descending aircraft; or

3. The Mode C readout is valid and indicates that the aircraft is established at the assigned altitude; or

4. The aircraft was transferred to you from another sector/position within your unit (intra-unit).

PHRASEOLOGY−
(In level flight situations), VERIFY AT (altitude/flight level).

(In climbing/descending situations),

(if aircraft has been assigned an altitude below the lowest useable flight level),

VERIFY ASSIGNED ALTITUDE (altitude). or

(If aircraft has been assigned a flight level at or above the lowest useable flight level),

VERIFY ASSIGNED FLIGHT LEVEL (flight level).

5-21. ALTITUDE CONFIRMATION-NON-MODE C

1. Request a pilot to confirm assigned altitude on initial contact unless:

a. The pilot states the assigned altitude; or

b. You assign a new altitude to a climbing or a descending aircraft; or

c. The aircraft was transferred to you from another sector/position within your unit (intra-unit).

PHRASEOLOGY−
(In level flight situations), VERIFY AT (altitude/flight level).

(In climbing/descending situations), VERIFY ASSIGNED ALTITUDE/FLIGHT LEVEL (altitude/flight level).

b. Reconfirm all pilot altitude read backs.

PHRASEOLOGY−
(If the altitude read back is correct),

AFFIRMATIVE (altitude).

(If the altitude read back is not correct),

NEGATIVE. CLIMB/DESCEND AND MAINTAIN (altitude),

o r

NEGATIVE. MAINTAIN (altitude).

5-22. AUTOMATIC ALTITUDE REPORTING/BEACON TERMINATION

1. Inform an aircraft when you want it to turn on/off the automatic altitude reporting feature of its transponder.
PHRASEOLOGY− SQUAWK ALTITUDE,

o r

STOP ALTITUDE SQUAWK.

NOTE−Controllers should be aware that not all aircraft have a capability to disengage the altitude squawk independently from the beacon code squawk. On some aircraft both functions are controlled by the same switch.

2. Inform an aircraft when you want it to turn off its transponder.

PHRASEOLOGY− STOP SQUAWK.

(For a military aircraft when you do not know if the military service requires that it continue operating on another mode),

STOP SQUAWK (mode in use).

5-23. ALTITUDE FILTERS

Set altitude filters to display Mode C altitude readouts to encompass all altitudes within the controller's jurisdiction. Set the upper limits no lower than 1,000 feet above the highest altitude for which the controller is responsible. In those stratified positions, set the lower limit to 1,000 feet or more below the lowest altitude for which the controller is responsible. When the position's area of responsibility includes down to an aerodrome field elevation, the unit will normally set the lower altitude filter limit to encompass the field elevation so that provisions of paragraph 1-6, Prevention of Aircraft Collisions, and paragraph 5-19, Validation of Mode C Readout, may be applied. Air traffic managers may authorize temporary suspension of this requirement when target clutter is excessive.

5-24 RADAR IDENTIFICATION GENERAL/METHODS

Before you provide radar service, establish and maintain radar identification of the aircraft involved, except as provided in paragraph 5−33, Radar Separation, sub-paragraphs (2) and (3).

Identify a primary or radar beacon target by using one of the following methods:

1. Observing a departing aircraft target within 1 mile of the takeoff runway end at aerodromes with an operating control tower, provided one of the following methods of coordination is accomplished:

a. A verbal rolling/boundary notification is issued for each departure; or

b. A nonverbal rolling/boundary notification is used for each departure aircraft.

NOTE−Nonverbal notification can be accomplished via the use of a manual or electronic "drop tube" or automation.

2. Observing a target whose position with respect to a fix (displayed on the video map, scribed on the map overlay, or displayed as a permanent echo) or a visual reporting point (whose range and azimuth from the radar antenna has been accurately determined and made available to the controller) corresponds with a direct position report received from an aircraft, and the observed track is consistent with the reported heading or route of flight. If a TACAN/VORTAC is located within 6,000 feet of the radar antenna, the TACAN/VORTAC may be used as a reference fix for radar identification without being displayed on the video map or map overlay.

3. Observing a target make an identifying turn or turns of 30 degrees or more, provided the following conditions are met:

a. Except in the case of a lost aircraft, a pilot position report is received which assures you that the aircraft is within radar coverage and within the area being displayed.

b. Only one aircraft is observed making these turns.

c. For aircraft operating in accordance with an IFR clearance, you either issue a heading away from an area which will require an increased minimum IFR altitude or have the aircraft climb to the highest minimum altitude in your area of jurisdiction before you issue a heading.

4. When using only Mode 3/A radar beacon to identify a target, use one of the following methods:

a. Request the aircraft to activate the "IDENT" feature of the transponder and then observe the identification display.

NOTE1-At facilities where the single-slash "IDENT" modification is installed or other decoder modifications have been made which increase the number of "blooming" target displays, it will be necessary to exercise additional care to preclude the possibility of misidentification.

Note 2-TERMINAL. When automated displays are operated in the analog mode, the "IDENT" return is displayed as a double slash and the emergency return as a single bloomer whenever the beacon control head is in the "fail" position.

PHRASEOLOGY− IDENT.
SQUAWK (code) AND IDENT.

b. Request the aircraft to change to a specific discrete or non-discrete code, as appropriate, and then observe the target or code display change.

c. Request the aircraft to change transponder to "standby." After you observe the target disappear for sufficient scans to assure that loss of target resulted from placing the transponder in "standby" position, request the aircraft to return transponder to normal operation and then observe the reappearance of the target.

PHRASEOLOGY− SQUAWK STANDBY,

then

SQUAWK NORMAL.

PHRASEOLOGY−
SQUAWK (4 digit discrete code), AND IF YOUR ALTITUDE REPORTING EQUIPMENT IS TURNED OFF, SQUAWK ALTITUDE.

5. Consider an auto-acquired aircraft as identified when the data block is displayed and is visible to you and one of the following conditions exist:

a. The radar or beacon identification procedures have been used to confirm the identity of the tagged target.

b. The aircraft is being handed off using a NAS automated system and one of the following does not appear in the data block: "CST", "NAT", "NT", "AMB", "OLD", "NB", "TU", "AM", "OL", or "TRK".

i. Use the data block to maintain target identity unless it is in a coast status or displaced from the appropriate target.

ii. A displaced data block must be updated at all times.

6. Questionable Identification.

a. Use more than one method of identification when proximity of targets, duplication of observed action, or any other circumstances cause doubt as to target identification.

b. If identification is questionable for any reason, take immediate action to re-identify the aircraft or terminate radar service.

7. Position Information: Inform an aircraft of its position whenever radar identification is established by means of identifying turns or by any of the beacon identification methods outlined in this paragraph. Position information need not be given when identification is established by position correlation or when a departing aircraft is identified within 1 mile of the takeoff runway end.

5-25. IDENTIFICATION STATUS

1. Inform an aircraft of radar contact when:

   a. Initial radar identification in the ATC system is established.

   b. Subsequent to loss of radar contact or terminating radar service, radar identification is reestablished.

PHRASEOLOGY−
RADAR CONTACT (position if required).

2. Inform an aircraft when radar contact is lost.

PHRASEOLOGY−
RADAR CONTACT LOST (alternative instructions when required).

5-26. TARGET MARKERS

Retain data blocks that are associated with the appropriate target symbol in order to maintain continuous identity of aircraft. Retain the data block until the aircraft has exited the sector or delegated airspace, and all potential conflicts have been resolved; including an aircraft that is a point out. The data block must display flight identification and altitude information, as a minimum.

5-27. TRANSFER OF RADAR IDENTIFICATION GENERAL AND TERMS

To provide continuous radar service to an aircraft and facilitate a safe, orderly, and expeditious flow of traffic, it is often necessary to transfer radar identification of an aircraft from one controller to another. This section describes the terms, methods, and responsibilities associated with this task. Inter-unit and intra-unit transfers of radar identification must be accomplished in all areas of radar surveillance except where it is not operationally feasible. Where such constraints exist, they must be:

1. Covered in letters of agreement which clearly state that control will not be based upon a radar handoff; or

2. Coordinated by the transferring and receiving controllers for a specified period of time.

3. Terms:

   a. Handoff. An action taken to transfer the radar identification of an aircraft from one controller to another controller if the aircraft will enter the receiving controller’s airspace and radio communications with the aircraft will be transferred.

   b. Radar Contact. The term used to inform the controller initiating a handoff that the aircraft is identified and approval is granted for the aircraft to enter the receiving controller’s airspace.

   c. Point Out. A physical or automated action taken by a controller to transfer the radar identification of an aircraft to another controller if the aircraft will or may enter the airspace or protected airspace of another controller and radio communications will not be transferred.

   d. Point Out Approved. The term used to inform the controller initiating a point out that the aircraft is identified and that approval is granted for the aircraft to enter the receiving controller’s airspace, as coordinated, without a communications transfer or the appropriate automated system response.

e. Traffic. A term used to transfer radar identification of an aircraft to another controller for the purpose of coordinating separation action. Traffic is normally issued:

i. In response to a handoff or point out.

ii. In anticipation of a handoff or point out; or

iii. In conjunction with a request for control of an aircraft.

f. Traffic Observed. The term used to inform the controller issuing the traffic restrictions that the traffic is identified and that the restrictions issued are understood and will be complied with.

5-28. METHODS OF TRANSFER OF RADAR IDENTIFICATION

1. Transfer the radar identification of an aircraft by at least one of the following methods:

a. Physically point to the target on the receiving controller's display.

b. Use landline voice communications.

c. Use automation capabilities.

d. Use the "Modify" or "Quick Look" functions for data transfer between the TRACON and tower cab only if specific procedures are established in a unit directive. The local controller has the responsibility to determine whether or not conditions are adequate for the use of ARTS data on the BRITE.

2. When making a handoff, point-out, or issuing traffic restrictions, relay information to the receiving controller in the following order:

a. The position of the target relative to a fix, map symbol, or radar target known and displayed by both the receiving and transferring controller. Mileage from the reference point may be omitted when relaying the position of a target if a full data block associated with the target has been forced on the receiving controller's radar display.

b. The aircraft identification, as follows:

i. The aircraft call sign; or

ii. The discrete beacon code of the aircraft during inter-unit point-outs only, if both the receiving and the transferring controllers agree.

NOTE−Acceptance of a point-out using the discrete beacon code as the aircraft's identification constitutes agreement.

iii. The assigned altitude, appropriate restrictions, and information that the aircraft is climbing or descending, if applicable, except when inter/intra-unit directives ensure that the altitude information will be known by the receiving controller.

PHRASEOLOGY−
HANDOFF/POINT-OUT/TRAFFIC (aircraft position) (aircraft ID),

o r

(discrete beacon code point-out only) (altitude, restrictions, and other appropriate information, if applicable).

c. When receiving a handoff, point-out, or traffic restrictions, respond to the transferring controller as follows:

PHRASEOLOGY−
(Aircraft ID) (restrictions, if applicable) RADAR CONTACT,

o r

(aircraft ID or discrete beacon code) (restrictions, if applicable) POINT-OUT APPROVED, o r

TRAFFIC OBSERVED,

o r

UNABLE (appropriate information, as required).

3. If any doubt as to target identification exists after attempting confirmation in accordance with this section, apply the provisions of paragraph 5-24, sub-paragraph 6, Questionable Identification.

5-29. TRAFFIC

1. When using the term "traffic" for coordinating separation, the controller issuing traffic must issue appropriate restrictions.

2. The controller accepting the restrictions must be responsible to ensure that approved separation is maintained between the involved aircraft.

5-30. TRANSFERRING CONTROLLER HANDOFF RESPONSIBILITIES

The transferring controller must:

1. Complete a radar handoff prior to an aircraft's entering the airspace delegated to the receiving controller.

2. Verbally obtain the receiving controller's approval prior to making any changes to an aircraft's flight path, altitude, or data block information while the handoff is being initiated or after acceptance, unless otherwise specified by a LOA or a unit directive.

3. Ensure that, prior to transferring communications:

a. Potential violations of adjacent airspace and potential conflicts between aircraft in their own area of jurisdiction are resolved.

b. Necessary coordination has been accomplished with all controllers through whose area of jurisdiction the aircraft will pass prior to entering the receiving controller's area of jurisdiction, except when such coordination is the receiving controller's responsibility as stated in paragraph 5-31, Receiving Controller Handoff, and unless otherwise specified by a LOA or a unit directive.

c. Restrictions issued to ensure separation are passed to the receiving controller.

4. After transferring communications, continue to comply with the requirements of subparagraphs c1 and 2.

5. Comply with restrictions issued by the receiving controller unless otherwise coordinated.

6. Comply with the provisions of paragraph 4-14, Transfer of Communications and to the extent possible, transfer communications when the transfer of radar identification has been accepted.

7. Advise the receiving controller of pertinent information not contained in the data block or flight progress strip unless covered in a LOA or unit directive. Pertinent information includes:

a. Assigned heading.

b. Air speed restrictions.

c. Altitude information issued.

d. Observed track or deviation from the last route clearance.

e. The beacon code if different from that normally used or previously coordinated.

f. Any other pertinent information.

8. Ensure that the data block is associated with the appropriate target.

9. Initiate verbal coordination to verify the position of primary or non-discrete targets when using the automated handoff functions except for intra-unit handoffs using single-sensor systems.

10. Initiate verbal coordination before transferring control of a track when "CST," "FAIL," "NONE," "NB," "NX," "IF," "NT", or "TRK" is displayed in the data block.

11. Advise the receiving controller that radar monitoring is required when the aircraft is on a direct route initiated by ATC that exceeds usable NAVAID distances.

12. Issue restrictions to the receiving controllers which are necessary to maintain separation from other aircraft within your area of jurisdiction before releasing control of the aircraft.

13. Consider the target being transferred as identified on the receiving controller's display when the receiving controller acknowledges receipt verbally or has accepted an automated handoff.

14. Accomplish the necessary coordination with any intervening controllers whose area of jurisdiction is affected by the receiving controller's delay in the climb or the descent of an aircraft through the vertical limits of your area of jurisdiction when the receiving controller advises you of that delay before accepting the transfer of radar identification unless otherwise specified by a LOA or a unit directive.

5-31. RECEIVING CONTROLLER HANDOFF PROCEDURES

The receiving controller must:

1. Ensure that the target position corresponds with the position given by the transferring controller or that there is an appropriate association between an automated data block and the target being transferred before accepting a handoff.

2. Issue restrictions that are needed for the aircraft to enter your sector safely before accepting the handoff.

3. Comply with restrictions issued by the initiating controller unless otherwise coordinated.

4. Before you issue control instructions directly to an aircraft that is within another controller's area of jurisdiction that will change that aircraft's heading, route, speed, altitude, or beacon code, ensure that coordination has been accomplished with each of the controllers listed below whose area of jurisdiction is affected by those instructions unless otherwise specified by a LOA or a unit directive:

a. The controller within whose area of jurisdiction the control instructions will be issued.

b. Any intervening controller(s) through whose area of jurisdiction the aircraft will pass.

5. After accepting a handoff from another controller, confirm the identity of primary target by advising the aircraft of its position, and of a beacon target by observing a code change, an "ident" reply, or a "standby" squawk unless one of these was used during handoff. These provisions do not apply at those towers which have been delegated the responsibility for providing/monitoring radar separation within designated areas by the parent approach control unit and the aircraft identification is assured by sequencing or positioning prior to the handoff.

6. When using appropriate equipment, consider a discrete beacon target's identity to be confirmed when:

a. The data block associated with the target being handed off indicates the computer assigned discrete beacon code is being received; or

b. You observe the deletion of a discrete code that was displayed in the data block; or

NOTE−When the aircraft generated discrete beacon code does not match the computer assigned beacon code, the code generated will be displayed in the data block. When the aircraft changes to the assigned discrete code, the code disappears from the data block. In this instance, the observance of code removal from the data block satisfies confirmation requirements.

c. You observe the numeric display of a discrete code that an aircraft has been instructed to squawk or reports squawking.

7. Initiate verbal coordination prior to accepting control of a track when "CST" is displayed in the data block.

8. Advise the transferring controller, prior to accepting the transfer of radar identification, that you will delay the climb or the descent of an aircraft through the vertical limits of the transferring controller's area of jurisdiction, unless otherwise specified in a LOA or a unit directive.

9. If you decide, *after* accepting the transfer of radar identification, to delay the aircraft's climb or descent through the vertical limits of the transferring controller's area of jurisdiction, advise the transferring controller of that decision as soon as possible. *You* now have the responsibility to ensure that the necessary coordination is accomplished with any intervening controller(s) whose area of jurisdiction is affected by that delay, unless otherwise specified in a LOA or a unit directive.

5-32. POINT OUT

1. The transferring controller must:

a. Obtain verbal approval before permitting an aircraft to enter the receiving controller's delegated airspace. Automated approval may be utilized in lieu of verbal, provided the appropriate automation software is operational (automated point out function), and the procedures are specified in a unit directive/LOA.

b. Obtain the receiving controller's approval before making any changes to an aircraft's flight path, altitude, or data block information after the point out has been approved.

c. Comply with restrictions issued by the receiving controller unless otherwise coordinated.

d. Be responsible for subsequent radar handoffs and communications transfer, including flight data revisions and coordination, unless otherwise agreed to by the receiving controller or as specified in a LOA.

2. The receiving controller must:

a. Ensure that the target position corresponds with the position given by the transferring controller or that there is an association between a computer data block and the target being transferred prior to approving a point out.

b. Be responsible for separation between point out aircraft and other aircraft for which he/she has separation responsibility.

c. Issue restrictions necessary to provide separation from other aircraft within his/her area of jurisdiction.

5-33. RADAR SEPARATION GENERAL APPLICATION

1. Radar separation may be applied between:

a. Radar identified aircraft.

b. An aircraft taking off and another radar identified aircraft when the aircraft taking off will be radar-identified within 1 mile of the runway end.

c. A radar-identified aircraft and one not radar-identified when either is cleared to climb/ descend through the altitude of the other provided.

2. The performance of the radar system is adequate and, as a minimum, primary radar targets are being displayed on the display being used within the airspace within which radar separation is being applied; and

3. Flight data on the aircraft not radar-identified indicate it is a type which can be expected to give adequate primary return in the area where separation is applied; and

4. The airspace within which radar separation is applied is not less than the following number of miles from the edge of the radar display:

a. When less than 40 miles from the antenna− *6 miles.*

b. When 40 miles or more from the antenna− *10 miles*.

c. Narrowband radar operations− *10 miles;* and

5. Radar separation is maintained between the radar-identified aircraft and all observed primary and secondary radar targets until non-radar separation is established from the aircraft not radar identified; and

6. When the aircraft involved are on the same relative heading, the radar-identified aircraft is vectored a sufficient distance from the route of the aircraft not radar identified to assure the targets are not superimposed prior to issuing the clearance to climb/descend.

5-34. TARGET SEPARATION

1. Apply radar separation:

a. Between the centres of primary radar targets; however, do not allow a primary target to touch another primary target or a beacon control slash.

b. Between the ends of beacon control slashes.

c. Between the end of a beacon control slash and the centre of a primary target.

5-35. TARGET RESOLUTION

1. A process to ensure that correlated radar targets or digitized targets do not touch.

2. Mandatory traffic advisories and safety alerts must be issued when this procedure is used.

3. Target resolution must be applied as follows:

a. Between the edges of two primary targets or the edges of primary digitized targets.

b. Between the end of the beacon control slash and the edge of a primary target or primary digitized target.

c. Between the ends of two beacon control slashes.

5-36. RADAR SEPARATION MINIMA

Separate aircraft by the following minima:

1. Single Sensor ASR or Digital Terminal Automation System (DTAS):

a. When less than 40 miles from the antenna− *3 miles.*

b. When 40 miles or more from the antenna− *5 miles.*

c. For single sensor ASR−9 with Mode S, when less than 60 miles from the antenna− *3 miles*.

NOTE−Wake turbulence procedures specify increased separation minima required for certain classes of aircraft because of the possible effects of wake turbulence.

WAKE TURBULENCE APPLICATION

2. Separate aircraft operating directly behind, or directly behind and less than 1,000 feet below, or following an aircraft conducting an instrument approach by:

NOTE−When applying wake turbulence separation criteria, directly behind means an aircraft is operating within 2500 feet of the flight path of the leading aircraft over the surface of the earth.

a. Heavy behind heavy− *4 miles.*

b. Large/heavy behind B757− *4 miles*.

c. Small behind B757− *5 miles.*

d. Small/large behind heavy − *5 miles.*

WAKE TURBULENCE APPLICATION

3. In addition to, separate an aircraft landing behind another aircraft on the same runway, or one making a touch-and-go, stop-and-go, or low approach by ensuring the following minima will exist at the time the preceding aircraft is over the landing threshold:

a. Small behind large− *4 miles*.

b. Small behind B757− *5 miles.*

c. Small behind heavy− *6 miles.*

4. 2.5 nautical miles (NM) separation is authorized between aircraft established on the final approach course within 10 NM of the landing runway when operating in single sensor slant range mode and aircraft remains within 40 miles of the antenna and:

a. The leading aircraft's weight class is the same or less than the trailing aircraft.

b. Heavy aircraft and the Boeing 757 are permitted to participate in the separation reduction as the trailing aircraft only.

c. An average runway occupancy time of 50 seconds or less is documented.

d. CTRDs are operational and used for quick glance references.

e. Turnoff points are visible from the control tower.

5-37. VERTICAL APPLICATION

Aircraft not laterally separated, may be vertically separated by one of the following methods:

1. Assign altitudes to aircraft, provided valid Mode C altitude information is monitored and the applicable separation minima are maintained at all times.

2. Assign an altitude to an aircraft after the aircraft previously at that altitude has been issued a climb/descent clearance and is observed (valid Mode C), or reports leaving the altitude.

5-38. SEPARATION EXCEPTIONS

1. Do not use Mode C to effect vertical separation with an aircraft on a cruise clearance, contact approach, or as specified in paragraph 5-76, Systems Requirements.

2. Assign an altitude to an aircraft only after the aircraft previously at that altitude is observed at or passing through another altitude separated from the first by the appropriate minima when:

a. Severe turbulence is reported.

b. Aircraft are conducting military aerial refueling.

c. The aircraft previously at that altitude has been issued a climb/descent at pilot's discretion.

5-39. PASSING OR DIVERGING

In accordance with the following criteria, all other approved separation may be discontinued and passing or diverging separation applied when:

1. Aircraft are on opposite/reciprocal courses and you have observed that they have passed each other; or aircraft are on same or crossing courses/assigned radar vectors and one aircraft has crossed the projected course of the other, and the angular difference between their courses/assigned radar vectors is at least 15 degrees.

NOTE−Two aircraft, both assigned radar vectors with an angular difference of at least 15 degrees, is considered a correct application of this paragraph.

2. The tracks are monitored to ensure that the primary targets, beacon control slashes, or full digital terminal system primary and/or beacon target symbols will not touch.

NOTE−Although all other approved separation may be discontinued, the requirements of Wake Turbulence Paragraph 5-35 must apply when operating behind a heavy jet/B757.

5-40. ADDITIONAL SEPARATION FOR FORMATION FLIGHTS

Because of the distance allowed between formation aircraft and lead aircraft, additional separation is necessary to ensure the periphery of the formation is adequately separated from other aircraft, adjacent airspace, or obstructions. Provide supplemental separation for formation flights as follows:

1. Separate a standard formation flight by adding 1 mile to the appropriate radar separation minima.

2. Separate two standard formation flights from each other by adding 2 miles to the appropriate separation minima.

3. Separate a nonstandard formation flight by applying the appropriate separation minima to the perimeter of the airspace encompassing the nonstandard formation or from the outermost aircraft of the nonstandard formation whichever applies.

4. If necessary for separation between a nonstandard formation and other aircraft, assign an appropriate beacon code to each aircraft in the formation or to the first and last aircraft in-trail.

NOTE−The additional separation provided in this paragraph, Additional Separation for Formation Flights, is not normally added to wake turbulence separation when a formation is following a heavier aircraft since none of the formation aircraft are likely to be closer to the heavier aircraft than the lead aircraft (to which the prescribed wake turbulence separation has been applied).

5-41. SEPARATION FROM OBSTRUCTIONS

1. Separate aircraft from obstructions depicted on the radar display by the following minima:

a. When less than 40 miles from the antenna− *3 miles.*

b. When 40 miles or more from the antenna− *5 miles.*

2. Vertical separation of aircraft above an obstruction depicted on the radar display may be discontinued after the aircraft has passed it.

5-42. ADJACENT AIRSPACE

1. If coordination between the controllers concerned has not been effected, separate radar-controlled aircraft from the boundary of adjacent airspace in which radar separation is also being used by the following minima:

a. When less than 40 miles from the antenna − *1 1/2 miles.*

b. When 40 miles or more from the antenna − *2 1/2 miles.*

2. Separate radar-controlled aircraft from the boundary of airspace in which non-radar separation is being used by the following minima:

a. When less than 40 miles from the antenna − *3 miles*.

b. When 40 miles or more from the antenna − *5 miles*.

3. The provisions of subparagraphs a and b do not apply to VFR aircraft being provided Class B, Class C, or TRSA services. Ensure that the targets of these aircraft do not touch the boundary of adjacent airspace.

4. VFR aircraft approaching Class B, Class C, Class D, or TRSA airspace which is under the control jurisdiction of another air traffic control unit should either be provided with a radar handoff or be advised that radar service is terminated, given their position in relation to the Class B, Class C, Class D, or TRSA airspace, and the ATC frequency, if known, for the airspace to be entered. These actions should be accomplished in sufficient time for the pilot to obtain the required ATC approval prior to entering the airspace involved, or to avoid the airspace.

5-43. EDGE OF SCOPE

Separate a radar-controlled aircraft climbing or descending through the altitude of an aircraft that has been tracked to the edge of the scope/display by the following minima until non-radar separation has been established:

1. When less than 40 miles from the antenna− *3 miles* from edge of scope.

2. When 40 miles or more from the antenna− *5 miles* from edge of scope.

5-44. BEACON TARGET DISPLACEMENT

When using a radar target display with a previously specified beacon target displacement to separate a beacon target from a primary target, adjacent airspace, obstructions, or terrain, add a 1 mile correction factor to the applicable minima.

5-45. RADAR VECTORS GENERAL/APPLICATION METHODS

Vector aircraft:

1. In controlled airspace for separation, safety, noise abatement, operational advantage, confidence maneuver, or when a pilot requests. Allow aircraft operating on an RNAV route to remain on their own navigation to the extent possible.

2. In Class G airspace only upon pilot request and as an additional service.

3. At or above the MVA or the minimum IFR altitude except as authorized for radar approaches, special VFR, VFR operations, or by the provisions of this paragraph for Vectors Below Minimum Altitude.

4. In airspace for which you have control jurisdiction, unless otherwise coordinated.

5. So as to permit it to resume its own navigation within radar coverage.

6. Operating special VFR only within Class B, Class C, Class D, or Class E surface areas.

7. Operating VFR at those locations where a special programme is established, or when a pilot requests, or you suggest and the pilot concurs.

8. Vector aircraft by specifying:

a. Direction of turn, if appropriate, and magnetic heading to be flown; or

PHRASEOLOGY−
TURN LEFT/RIGHT HEADING (degrees).

FLY HEADING (degrees). FLY PRESENT HEADING.

DEPART (fix) HEADING (degrees).

b. The number of degrees, in group form, to turn and the direction of turn; or

PHRASEOLOGY−
TURN (number of degrees) DEGREES LEFT/RIGHT.

c. For NO-GYRO procedures, the type of vector, direction of turn, and when to stop turn.

PHRASEOLOGY−
THIS WILL BE A NO-GYRO VECTOR,

TURN LEFT/RIGHT. STOP TURN.

9. When initiating a vector, advise the pilot of the purpose.

PHRASEOLOGY−
VECTOR TO (fix or airway).

VECTOR TO INTERCEPT (name of NAVAID) (specified) RADIAL.

VECTOR FOR SPACING.

VECTOR TO FINAL APPROACH COURSE,

or if the pilot does not have knowledge of the type of approach,

VECTOR TO (approach name) FINAL APPROACH COURSE.

NOTE−Determine optimum routing based on factors such as wind, weather, traffic, pilot requests, noise abatement, adjacent sector requirement, and letters of agreement.

10. Issue with the vector an altitude to maintain and all appropriate altitude restrictions when:

a. The vector will take the aircraft off an assigned procedure which contains altitude instructions, i.e., instrument approach, non-radar SID, FMSP, etc.

b. The previously issued clearance included crossing restrictions.

.

11. If appropriate, advise the pilot what to expect when the vector is completed.

PHRASEOLOGY−
EXPECT TO RESUME (Route, SID, STAR, FMSP, etc.).

NOTE−You must ensure that the pilot is made aware if he/she is expected to resume a previously issued route procedure.

12. Provide radar navigational guidance until the aircraft is:

a. Established within the airspace to be protected for the non-radar route to be flown; or

b. On a heading that will, within a reasonable distance, intercept the non-radar route to be flown,; and

c. Informed of its position unless the aircraft is RNAV, FMS, or DME equipped and being vectored toward a VORTAC/TACAN or waypoint and within the service volume of the NAVAID.

PHRASEOLOGY−
(Position with respect to course/fix along route), RESUME OWN NAVIGATION,

o r

FLY HEADING (degrees). WHEN ABLE, PROCEED DIRECT (name of fix),

o r

RESUME (name/number/FMSP/SID/transition/STAR/ procedure).

13. Aircraft instructed to resume a procedure which contains restrictions (SID/STAR/FMSP, etc.) must be issued/reissued all applicable restrictions or must be advised to comply with those restrictions.

PHRASEOLOGY−
RESUME (name/$_{number}$ FMSP/SID/transition/STAR), COMPLY WITH RESTRICTIONS.

EXAMPLE−
"Resume the Mudde One Arrival, comply with restrictions."
"Cleared direct Luxor, resume the Ksino One arrival, comply with restrictions."

14. Aircraft vectored off an RNAV route must be re-cleared to the next waypoint or as requested by the pilot.

15. During Stage A operation, update the route of flight in the computer unless an operational advantage is gained and coordination is accomplished.

16. Inform the pilot when a vector will take the aircraft across a previously assigned non-radar route.

PHRASEOLOGY−
EXPECT VECTOR ACROSS (NAVAID radial) (airway/route/course) FOR (purpose).

17. Vectors Below Minimum Altitude, you may vector a departing IFR aircraft, or one executing a missed approach, within 40 miles of the radar antenna and before it reaches the minimum altitude for IFR operations if separation from prominent obstacles shown on the radar scope is applied in accordance with the following:

a. If the flight path is 3 miles or more from the obstacle and the aircraft is climbing to an altitude at least 1,000 feet above the obstacle, vector the aircraft to maintain at least 3 miles separation from the obstacle until the aircraft reports leaving an altitude above the obstacle.

b. If the flight path is less than 3 miles from the obstacle and the aircraft is climbing to an altitude at least 1,000 feet above the obstacle, vector the aircraft to increase lateral separation from the obstacle until the 3 mile minimum is achieved or until the aircraft reports leaving an altitude above the obstacle.

c. At those locations where diverse vector areas (DVA) have been established, terminal radar facilities may vector aircraft below the MVA/MIA within those areas and along those routes described in unit directives.

5-46. SPEED ADJUSTMENT GENERAL/APPLICATION/METHODS/MINIMA

Keep speed adjustments to the minimum necessary to achieve or maintain required or desired spacing. Avoid adjustments requiring alternate decreases and increases. Permit pilots to resume normal speed when previously specified adjustments are no longer needed.

NOTE−It is the pilot's responsibility and prerogative to refuse speed adjustment that he/she considers excessive or contrary to the aircraft's operating specifications.

1. Consider the following when applying speed control:

a. Determine the interval required and the point at which the interval is to be accomplished.

b. Implement speed adjustment based on the following principles.

i. Priority of speed adjustment instructions is determined by the relative speed and position of the aircraft involved and the spacing requirement.

ii. Speed adjustments are not achieved instantaneously. Aircraft configuration, altitudes, and speed determine the time and distance required to accomplish the adjustment.

c. Use the following techniques in speed control situations:

2. Compensate for compression when assigning air speed adjustment in an in-trail situation by using one of the following techniques:

a. Reduce the trailing aircraft first.

b. Increase the leading aircraft first.

3. Assign a specific airspeed if required to maintain spacing.

4. Allow increased time and distance to achieve speed adjustments in the following situations:

a. Higher altitudes.

b. Greater speed.

c. Ensure that aircraft are allowed to operate in a clean configuration as long as circumstances permit.

5. Keep the number of speed adjustments per aircraft to the minimum required to achieve and maintain spacing.

6. Do not assign speed adjustment to aircraft:

a. Executing a published high altitude instrument approach procedure.

b. In a holding pattern.

c. Inside the final approach fix on final or a point 5 miles from the runway, whichever is closer to the runway.

7. At the time approach clearance is issued, previously issued speed adjustments must be restated if required.

8. Approach clearances cancel any previously assigned speed adjustment. Pilots are expected to make their own speed adjustments to complete the approach unless the adjustments are restated.

9. Express speed adjustments in terms of knots based on indicated airspeed (IAS) in 10−knot increments. At or above FL 240, speeds may be expressed in terms of Mach numbers in 0.01 increments for turbojet aircraft with Mach metres (i.e., Mach 0.69, 0.70, 0.71, etc.).

Note 1-Pilots complying with speed adjustment instructions should maintain a speed within plus or minus 10 knots or 0.02 Mach number of the specified speed.

Note 2-When assigning speeds to achieve spacing between aircraft at different altitudes, consider that ground speed may vary with altitude. Further speed adjustment may be necessary to attain the desired spacing.

10. Instruct aircraft to:

a. Maintain present/specific speed.

b. Maintain specified speed or greater/less.

c. Maintain the highest/lowest practical speed.

d. Increase or reduce to a specified speed or by a specified number of knots.

PHRASEOLOGY− SAY AIRSPEED.

SAY MACH NUMBER.

MAINTAIN PRESENT SPEED.

MAINTAIN (specific speed) KNOTS.

MAINTAIN (specific speed) KNOTS OR GREATER.

DO NOT EXCEED (speed) KNOTS.

MAINTAIN MAXIMUM FORWARD SPEED.

MAINTAIN SLOWEST PRACTICAL SPEED.

INCREASE/REDUCE SPEED:

TO (specified speed in knots),

or

TO MACH (Mach number),

o r

(number of knots) KNOTS.

EXAMPLE−
"Increase speed to Mach point seven two."
"Reduce speed to two five zero." "Reduce speed twenty knots." "Maintain two eight zero knots." "Maintain maximum forward speed."

11. Simultaneous speed reduction and descent can be extremely difficult, particularly for turbojet aircraft. Specifying which action is to be accomplished first removes any doubt the pilot may have as to controller intent or priority. Specify which action is expected first when combining speed reduction with a descent clearance.

a. Speed reductions prior to descent.

PHRASEOLOGY− REDUCE SPEED:

TO (specified speed), or

(number of knots) KNOTS.

THEN, DESCEND AND MAINTAIN (altitude).

b. Speed reduction following descent.

PHRASEOLOGY−
DESCEND AND MAINTAIN (altitude).

THEN, REDUCE SPEED: TO (specified speed in knots), or

TO MACH (Mach number), or

(number of knots) KNOTS.

NOTE−It may be necessary for the pilot to level off temporarily and reduce speed prior to descending below 10,000 feet MSL.

12. Specify combined speed/altitude fix crossing restrictions.

PHRASEOLOGY−
CROSS (fix) AT AND MAINTAIN (altitude) AT (specified speed) KNOTS.

13. Speed Control Minima; when assigning airspeeds, use the following recommended/required minima:

a. To aircraft operating between FL 280 and 10,000 feet, a speed not less than 250 knots or the equivalent Mach number.

b. When an operational advantage will be realised, speeds lower than the recommended minima may be applied.

c. To arrival aircraft operating below 10,000 feet:

i. Turbojet aircraft. A speed not less than 210 knots; except when the aircraft is within 20 flying miles of the runway threshold of the aerodrome of intended landing, a speed not less than 170 knots.

ii. Reciprocating engine and turboprop aircraft. A speed not less than 200 knots; except when the aircraft is within 20 flying miles of the runway threshold of the aerodrome of intended landing, a speed not less than 150 knots.

d. Departures:

i. Turbojet aircraft. A speed not less than 230 knots.

ii. Reciprocating engine and turboprop aircraft. A speed not less than 150 knots.

e. Helicopters. A speed not less than 60 knots.

14. Advise aircraft when speed adjustment is no longer needed.

PHRASEOLOGY−
RESUME NORMAL SPEED.

NOTE−An instruction to "resume normal speed" does not delete speed restrictions that are applicable to published procedures of upcoming segments of flight, unless specifically stated by ATC.

5-47. RADAR DEPARTURE PROCEDURES

Use standard departure routes and channelized altitudes whenever practical to reduce coordination. Do not, however, assign these routes solely to provide for possible radar or communication failure.

5-48. INITIAL HEADING FOR DEPARTURE

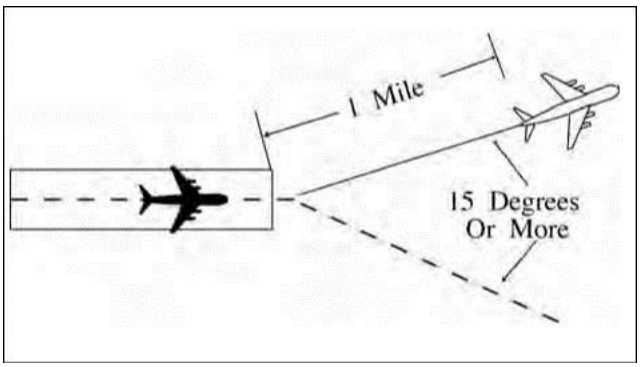
Before departure, assign the initial heading to be flown if a departing aircraft is to be vectored immediately after takeoff.

5-49. SUCCESSIVE OR SIMULTANEOUS DEPARTURES

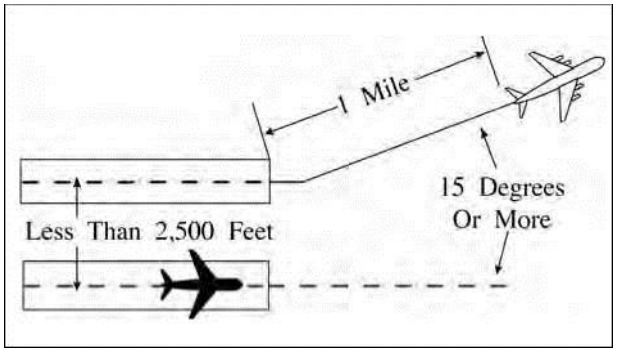
Separate aircraft departing from the same aerodrome/ heliport or adjacent aerodromes/heliports in accordance with the following minima provided radar identification with the aircraft will be established within 1 mile of the takeoff runway end/helipad and courses will diverge by 15 degrees or more.

1. Between aircraft departing the same runway/ helipad or parallel runways/helicopter takeoff courses separated by less than 2,500 feet− *1 mile* if courses diverge immediately after departure. (See FIG 5−1, FIG 5−2, and FIG 5−3.)

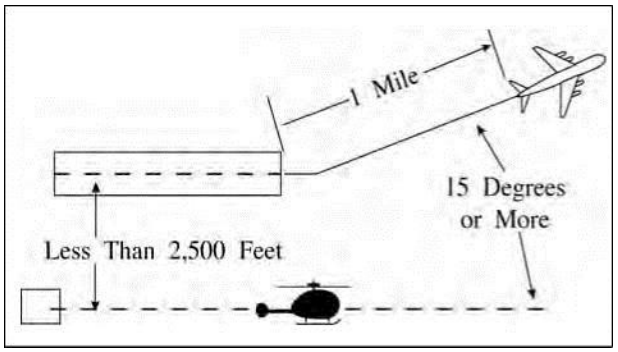
Successive Departures Figure 5-1



Simultaneous Departures Figure 5-2



Simultaneous Departures Figure 5-3

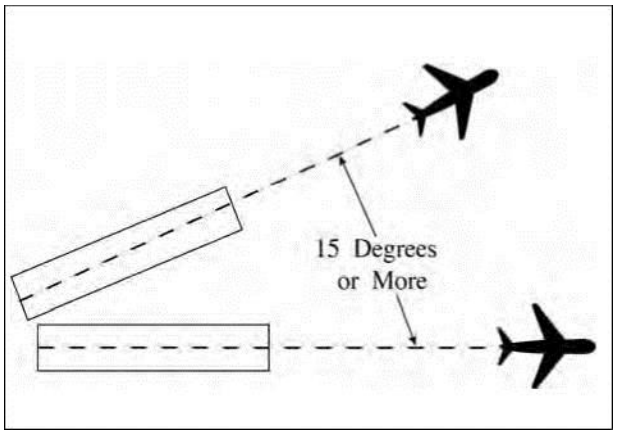


NOTE−This procedure does not apply when a small aircraft is taking off from an intersection on the same runway behind a large aircraft or when an aircraft is departing behind a heavy jet/B757.

2. Between aircraft departing from diverging runways:

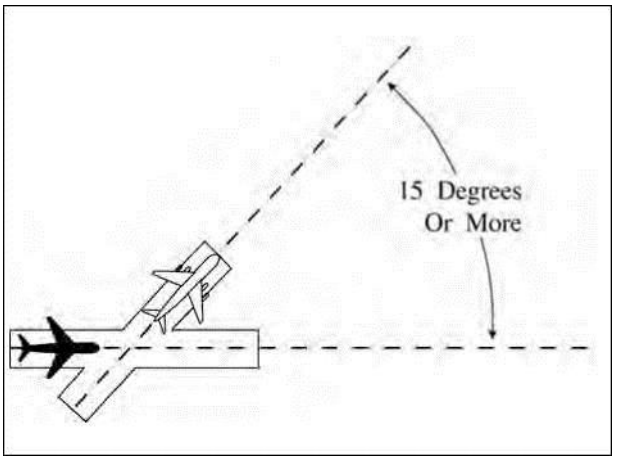
a. Nonintersecting runways. Authorize simultaneous takeoffs if runways diverge by 15 degrees or more. (See FIG 5−4.)

Nonintersecting Runway Departures Figure 5-4



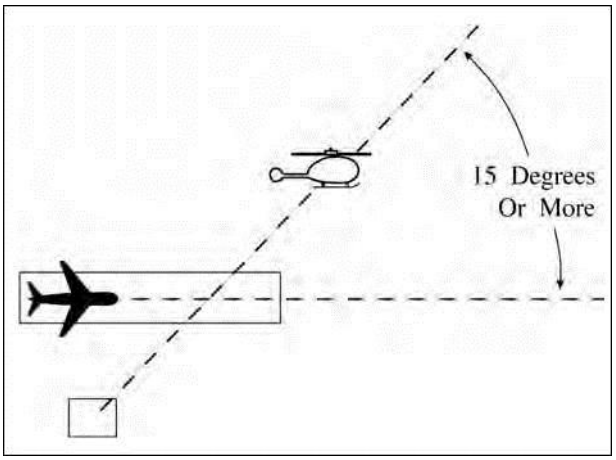
3. Intersecting runways and/or helicopter takeoff courses which diverge by 15 degrees or more. Authorize takeoff of a succeeding aircraft when the preceding aircraft has passed the point of runway and/or takeoff course intersection. (See FIG 5−5 and FIG 5−6.)

Intersecting Runway Departures Figure 5-5



NOTE−This procedure does not apply when aircraft are departing behind a heavy jet/B757.

Intersecting Helicopter Course Departures Figure 5-6



5-50. RADAR DEPARTURE AND ARRIVAL

Except as provided in provided in paragraph 5-51, Departures and Arrivals on Parallel or Nonintersecting Diverging Runways, Separate a departing aircraft from an arriving aircraft on final approach by a minimum of *2 miles* if separation will increase to a minimum of 3 miles (5 miles when 40 miles or more from the antenna) within 1 minute after takeoff.

NOTE 1. This procedure permits a departing aircraft to be released so long as an arriving aircraft is no closer than 2 miles from the runway at the time. This separation is determined at the time the departing aircraft commences takeoff roll.

Note 2. Consider the effect surface conditions, such as ice, snow, and other precipitation, may have on known aircraft performance characteristics, and the influence these conditions may have on the pilot's ability to commence takeoff roll in a timely manner.

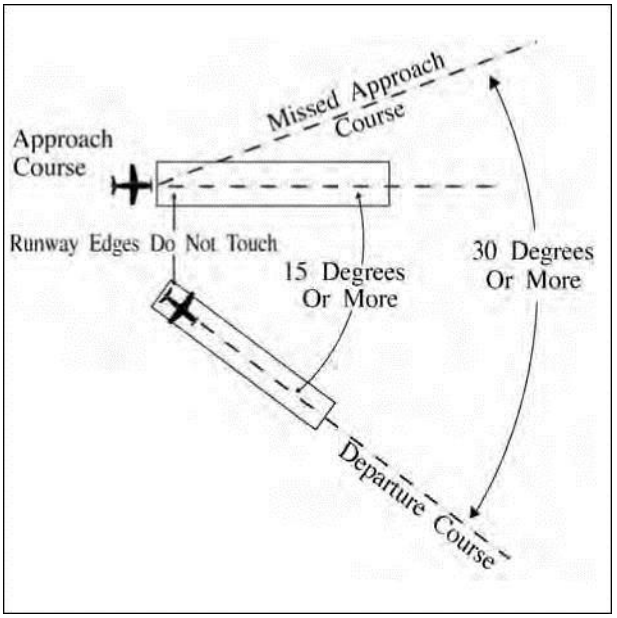
5-51. DEPARTURES AND ARRIVALS ON PARALLEL OR NONINTERSECTING DIVERGING RUNWAYS

Authorize simultaneous operations between an aircraft departing on a runway and an aircraft on final approach to another parallel or nonintersecting diverging runway if the departure course diverges immediately by at least 30 degrees from the missed approach course until separation is applied and provided one of the following conditions are met:

NOTE−When one or both of the takeoff/landing surfaces is a helipad, consider the helicopter takeoff course as the runway centreline and the helipad centre as the threshold.

1. When nonintersecting runways diverge by 15 degrees or more and runway edges do not touch. (See FIG 5−7)

Diverging Nonintersecting Runways Figure 5-7



2. When the aircraft on takeoff is a helicopter, hold the helicopter until visual separation is possible or apply the separation criteria in paragraphs 5-48 or 5-49.

5-52. VECTORS TO FINAL APPROACH COURSE

Except as provided in paragraph 11-8 Visual Approach, vector arriving aircraft to intercept the final approach course:

1. At least 2 miles outside the approach gate unless one of the following exists:

   a. When the reported ceiling is at least 500 feet above the MVA/MIA and the visibility is at least 3 miles (report may be a PIREP if no weather is reported for the aerodrome), aircraft may be vectored to intercept the final approach course closer than 2 miles outside the approach gate but no closer than the approach gate.

   b. If specifically requested by the pilot, aircraft may be vectored to intercept the final approach course inside the approach gate but no closer than the final approach fix.

EXCEPTION. Conditions 1 and 2 above do not apply to RNAV aircraft being vectored for a GPS or RNAV approach.

2. For a precision approach, at an altitude not above the glideslope/glidepath or below the minimum glideslope intercept altitude specified on the approach procedure chart.

3. For a non-precision approach, at an altitude which will allow descent in accordance with the published procedure.

NOTE−A pilot request for an "evaluation approach," or a "coupled approach," or use of a similar term, indicates the pilot desires the application of subparagraphs a and b.

5-53. FINAL APPROACH COURSE INTERCEPTION/VECTORS ACROSS FINAL APPROACH COURSE

1. Assign headings that will permit final approach course interception on a track that does not exceed the interception angles specified in TBL 5−1.

TBL 5−1
Approach Course Interception Angle

Distance from interception point to approach gate	Maximum interception angle
Less than 2 miles or triple simultaneous ILS/MLS approaches in use	20 degrees
2 miles or more	30 degrees (45 degrees for helicopters)

2. If deviations from the final approach course are observed after initial course interception, apply the following:

a. Outside the approach gate: apply procedures in accordance with subparagraph a, if necessary, vector the aircraft for another approach.

b. Inside the approach gate: inform the pilot of the aircraft's position and ask intentions.

PHRASEOLOGY−
(Ident) (distance) MILE(S) FROM THE AERODROME, (distance) MILE(S) RIGHT/LEFT OF COURSE, SAY INTENTIONS.

NOTE−The intent is to provide for a track course intercept angle judged by the controller to be no greater than specified by this procedure.

3. Inform the aircraft whenever a vector will take it across the final approach course and state the reason for such action.

NOTE−In the event you are unable to so inform the aircraft, the pilot is not expected to turn inbound on the final approach course unless approach clearance has been issued.

PHRASEOLOGY−
EXPECT VECTORS ACROSS FINAL FOR (purpose).

EXAMPLE−
"EXPECT VECTORS ACROSS FINAL FOR SPACING."

5-54. ARRIVAL INSTRUCTIONS

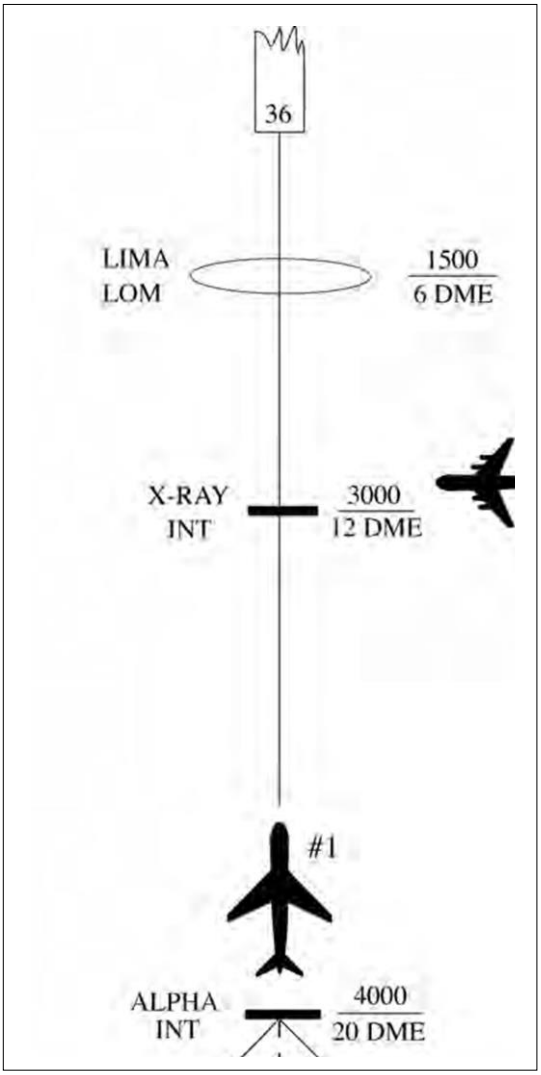
Issue all of the following to an aircraft before it reaches the approach gate:

1. Position relative to a fix on the final approach course. If none is portrayed on the radar display or if none is prescribed in the procedure, issue position information relative to the navigation aid which provides final approach guidance or relative to the aerodrome.

2. Vector to intercept the final approach course if required.

3. Approach clearance except when conducting a radar approach. Issue approach clearance only after the aircraft is: Established on a segment of a published route or instrument approach procedure, or see FIG 5−8 Example 1.

Figure 5-8



EXAMPLE−

1. Aircraft 1 was vectored to the final approach course but clearance was withheld. It is now at 4,000 feet and established on a segment of the instrument approach procedure. “Seven miles from X-RAY. Cleared I−L−S runway three six approach.” (See FIG 5−8.)

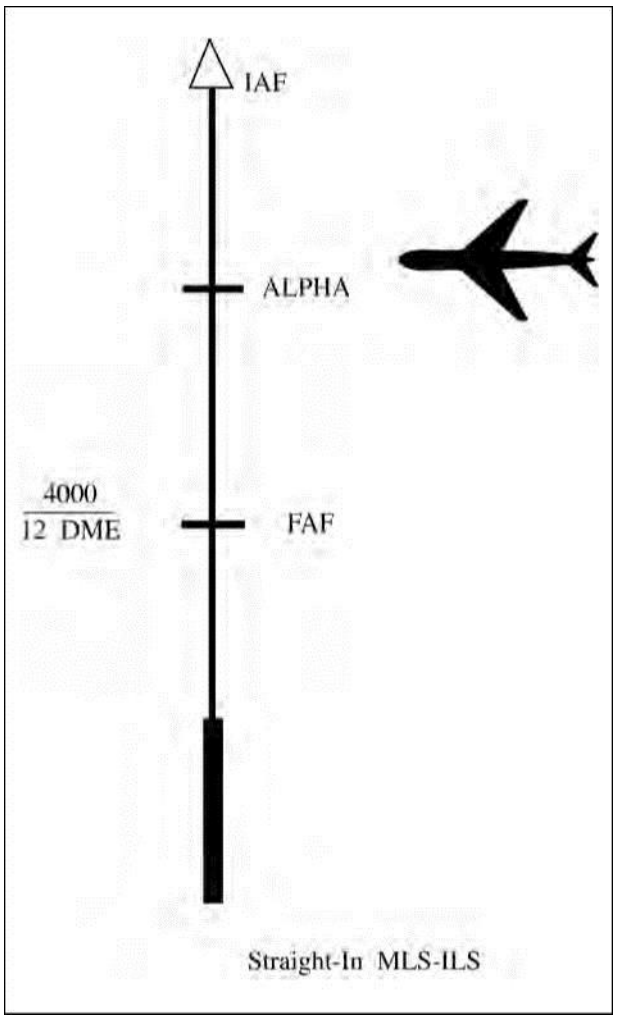
2. Aircraft 2 is being vectored to a published segment of the final approach course, 4 miles from LIMA at 2,000 feet. The MVA for this area is 2,000 feet. “Four miles from LIMA. Turn right heading three four zero. Maintain two thousand until established on the localizer. Cleared I−L−S runway three six approach.” (See FIG 5−8.)

3. Aircraft 3 is being vectored to intercept the final approach course beyond the approach segments, 5 miles from Alpha at 5,000 feet. the MVA for this area is 4,000 feet. “Five miles from Alpha. Turn right heading three three zero. Cross Alpha at or above four thousand. Cleared I−L−S runway three six approach.” (See FIG 5−8.)

4. Aircraft 4 is established on the final approach course beyond the approach segments, 8 miles from Alpha at 6,000 feet. The MVA for this area is 4,000 feet. “Eight miles from Alpha. Cross Alpha at or above four thousand. Cleared I−L−S runway three six approach.”
(See FIG 5−8.)

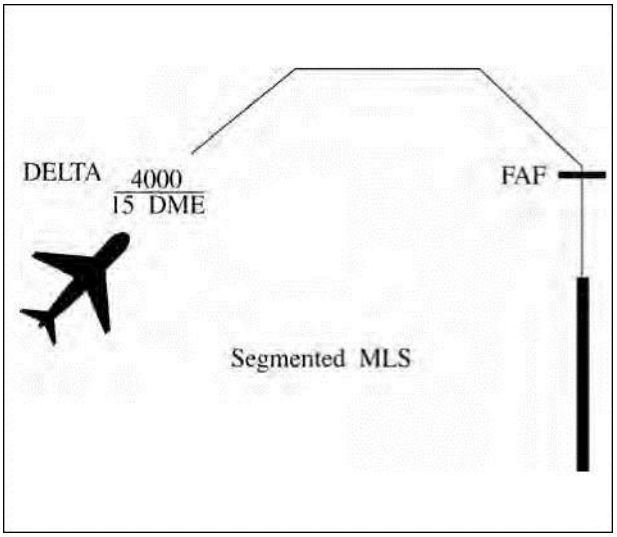
4. Assigned an altitude to maintain until the aircraft is established on a segment of a published route or instrument approach procedure. (See FIG 5−9 thru FIG 5−11.)

Arrival Instructions Figure 5-9



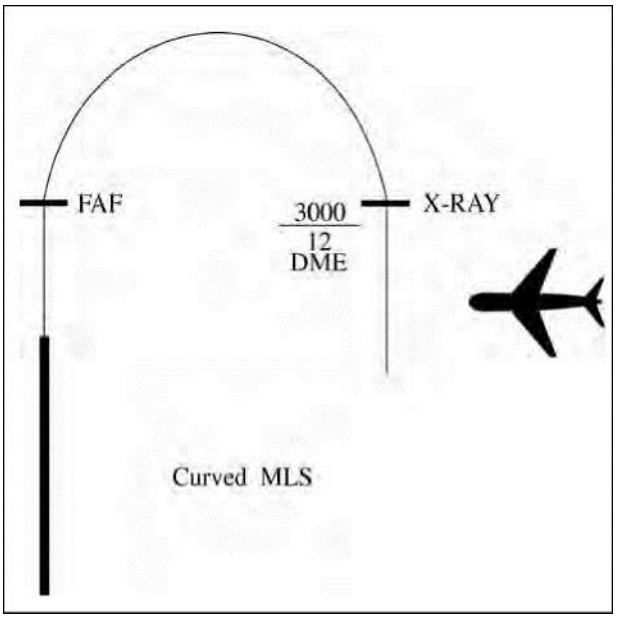
EXAMPLE−The aircraft is being vectored to a published segment of the MLS final approach course, 3 miles from Alpha at 4,000 feet. The MVA for this area is 4,000 feet. “Three miles from Alpha. Turn left heading two one zero. Maintain four thousand until established on the azimuth course. Cleared M−L−S runway one eight approach.” (See FIG 5−9.)

Arrival Instructions Figure 5-10



EXAMPLE−
The aircraft is en route to Delta waypoint at 6,000 feet. The MVA for this area is 4,000 feet. “Cross Delta at or above four thousand. Cleared M−L−S runway one eight approach.” (See FIG 5−10.)

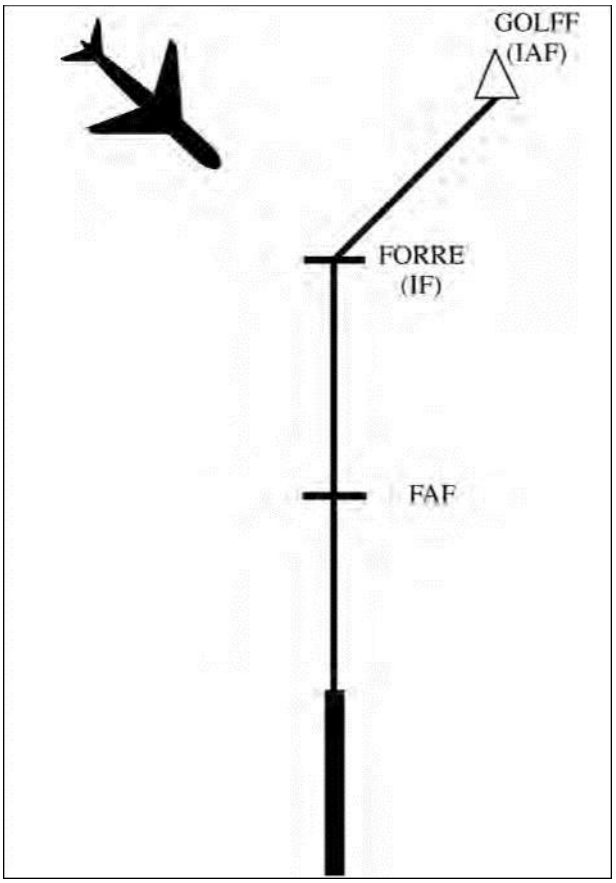
Arrival Instructions Figure 5-11



EXAMPLE−

The aircraft is being vectored to an MLS curved approach, 3 miles from X-ray at 3,000 feet. "Three miles from X-ray. Turn right heading three three zero. Maintain three thousand until established on the azimuth course. Cleared M−L−S runway one eight approach."
(See FIG 5−11.)

Arrival Instructions Figure 5-12



EXAMPLE−
The aircraft is being vectored to the intermediate fix FORRE for an RNAV approach. "Seven miles from FOORE, cleared direct FORRE, cross FORRE at or above four thousand, cleared RNAV runway one eight approach."

NOTE 1. The altitude assigned must assure IFR obstruction clearance from the point at which the approach clearance is issued until established on a segment of a published route or instrument approach procedure.

Note 2. If the altitude assignment is VFR-on-top, it is conceivable that the pilot may elect to remain high until arrival over the final approach fix which may require the pilot to circle to descend so as to cross the final approach fix at an altitude that would permit landing.

5. Instructions to do one of the following:

NOTE−The principal purpose of this paragraph is to ensure that frequency changes are made prior to passing the final approach fix. However, at times it will be desirable to retain an aircraft on the approach control frequency to provide a single-frequency approach or other radar services. When this occurs, it will be necessary to relay tower clearances or instructions to preclude changing frequencies prior to landing or approach termination.

a. Monitor local control frequency, reporting to the tower when over the approach fix.

b. Contact the tower on local control frequency.

c. Contact the final controller on the appropriate frequency if radar service will be provided on final on a different frequency.

d. When radar is used to establish the final approach fix, inform the pilot that after being advised that he/she is over the fix he/she is to contact the tower on local control frequency.

EXAMPLE−
"Three miles from final approach fix. Turn left heading zero one zero. Maintain two thousand until established on the localizer. Cleared I−L−S runway three six approach. I will advise when over the fix."

"Over final approach fix. Contact tower one one eight point one."

NOTE−ARSR may be used for establishment of initial approach and intermediate approach fixes only. ASR must be used to establish the final approach fix.

e. Where a Terminal Arrival Area (TAA) has been established to support RNAV approaches, inform the aircraft of its position relative to the appropriate IAF and issue the approach clearance.

EXAMPLE−
1. Aircraft 1: The aircraft is in the straight in area of the TAA. "Seven miles from CENTR, Cleared R−NAV Runway One Eight Approach."

2. Aircraft 2: The aircraft is in the left base area of the TAA. "One five miles from LEFTT, Cleared GPS Runway One Eight Approach."

3. Aircraft 3: The aircraft is in the right base area of the TAA. "Four miles from WRITE, Cleared FMS Runway One Eight Approach."

5-55. Approach Separation Responsibility

The radar controller performing the approach control function is responsible for separation of radar arrivals unless visual separation is provided by the tower, or a letter of agreement/unit directive authorizes otherwise. Radar final controllers ensure that established separation is maintained between aircraft under their control and other aircraft established on the same final approach course.

5-56. RADAR APPROACHES

1. Provide radar approaches in accordance with standard or special instrument approach procedures.

2. A radar approach may be given to any aircraft upon request and may be offered to aircraft in distress regardless of weather conditions or to expedite traffic.

NOTE−Acceptance of a radar approach by a pilot does not waive the prescribed weather minima for the aerodrome or for the particular aircraft operator concerned. The pilot is responsible for determining if the approach and landing are authorized under the existing weather minima.

5-57. APPROACH INFORMATION

1. Issue the following information to an aircraft that will conduct a radar approach. Current approach information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS broadcast code. All items listed below, except for subparagraph 3, may be omitted after the first approach if repeated approaches are made and no change has occurred. Transmissions with aircraft in this phase of the approach should occur approximately every minute.

a. Altimeter setting.

b. If available, ceiling and visibility if the ceiling at the aerodrome of intended landing is reported below 1,000 feet or below the highest circling minimum, whichever is greater, or if the visibility is less than 3 miles. Advise pilots when weather information is available via the Automated Weather Observing System (AWOS)/Automated Surface Observing System (ASOS) and, if requested, issue the appropriate frequency.

c. Issue any known changes classified as special weather observations as soon as possible. Special weather observations need not be issued after they are included in the ATIS broadcast and the pilot states the appropriate ATIS broadcast code.

d. Pertinent information on known aerodrome conditions if they are considered necessary to the safe operation of the aircraft concerned.

e. Lost communication procedures as specified in paragraph 5-58, Lost Communications.

2. Before starting final approach:

NOTE−ASR approach procedures may be prescribed for specific runways, for an aerodrome/heliport, and for helicopters only to a "point-in-space, "i.e., a MAP from which a helicopter must be able to proceed to the landing area by visual reference to a prescribed surface route.

a. Inform the aircraft of the type of approach, runway, aerodrome, heliport, or other point, as appropriate, to which the approach will be made. Specify the aerodrome name when the approach is to a secondary aerodrome.

PHRASEOLOGY−
THIS WILL BE A P−A−R/SURVEILLANCE APPROACH TO:

RUNWAY (runway number),

or

(aerodrome name) AERODROME, RUNWAY (runway number),

or

(aerodrome name) AERODROME/HELIPORT.

THIS WILL BE A COPTER P−A−R APPROACH TO:

RUNWAY (runway number)

or

(aerodrome name) AERODROME, RUNWAY (runway number), or

(aerodrome name) AERODROME/HELIPORT.

b. For surveillance approaches, specify the location of the MAP in relation to the runway/aerodrome/ heliport.

PHRASEOLOGY−

MISSED APPROACH POINT IS (distance) MILE(S) FROM RUNWAY/AERODROME/HELIPORT,

or for a point-in-space approach,

A MISSED APPROACH POINT (distance) MILE(S) (direction from landing area) OF (aerodrome name) AERODROME/HELIPORT.

EXAMPLE−
Helicopter point-in-space approach:

"Army copter Zulu Two, this will be a surveillance approach to a missed approach point, three point five miles south of Creedon Heliport."

3. Inform an aircraft making an approach to an aerodrome not served by a tower that no traffic or landing runway information is available for that aerodrome.

PHRASEOLOGY−
NO TRAFFIC OR LANDING RUNWAY INFORMATION AVAILABLE FOR THE AERODROME.

5-58. NO-GYRO APPROACH

When an aircraft will make a no-gyro surveillance approach:

1. Before issuing a vector, inform the aircraft of the type of approach.

PHRASEOLOGY−
THIS WILL BE A NO-GYRO SURVEILLANCE/P−A−R APPROACH.

2. Instruct the aircraft when to start and stop turn.
PHRASEOLOGY−
TURN LEFT/RIGHT. STOP TURN.

3. After turn on to final approach has been made and prior to the aircraft reaching the approach gate, instruct the aircraft to make half-standard rate turns.

PHRASEOLOGY−
MAKE HALF-STANDARD RATE TURNS.

5-59. LOST COMMUNICATIONS ON APPROACH

When weather reports indicate that an aircraft will likely encounter IFR weather conditions during the approach, take the following action as soon as possible after establishing radar identification and radio communications (may be omitted after the first approach when successive approaches are made and the instructions remain the same):

1. If lost communications instructions will require the aircraft to fly on an unpublished route, issue an appropriate altitude to the pilot. If the lost communications instructions are the same for both pattern and final, the pattern/vector controller must issue both. Advise the pilot that if radio communications are lost for a specified time interval (not more than 1 minute) on vector to final approach, 15 seconds on a surveillance final approach, to:

a. Attempt contact on a secondary or a tower frequency.

b. Proceed in accordance with visual flight rules if possible.

c. Proceed with an approved non-radar approach, or execute the specific lost communications procedure for the radar approach being used.

PHRASEOLOGY−

IF NO TRANSMISSIONS ARE RECEIVED FOR (time interval) IN THE PATTERN OR FIVE/FIFTEEN SECONDS ON FINAL APPROACH, ATTEMPT CONTACT ON (frequency), AND

if the possibility exists,

PROCEED VFR. IF UNABLE: if approved,

PROCEED WITH (non-radar approach); MAINTAIN (altitude) UNTIL ESTABLISHED ON/OVER FIX/ NAVAID/APPROACH PROCEDURE,

or

(alternative instructions).

PHRASEOLOGY−

IF NO TRANSMISSIONS ARE RECEIVED FOR FIVE SECONDS AFTER LOSS OF DATA LINK, ATTEMPT CONTACT ON (frequency), AND

if the possibility exists,

PROCEED VFR. IF UNABLE: if approved,

PROCEED WITH (non-radar approach); MAINTAIN (altitude) UNTIL ESTABLISHED ON/OVER FIX/ NAVAID/APPROACH PROCEDURE,

o r

(alternative instructions).

2. If the final approach lost communications instructions are changed, differ from those for the pattern, or are not issued by the pattern controller, they must be issued by the final controller.

3. If the pilot states that he/she cannot accept a lost communications procedure due to weather conditions or other reasons, request the pilot's intention.

NOTE−The pilot is responsible for determining the adequacy of lost communications procedures with respect to aircraft performance, equipment capability, or reported weather.

5-60. RADAR CONTACT LOST ON APPROACH

If radar contact is lost during an approach and the aircraft has not started final approach, clear the aircraft to an appropriate NAVAID/fix for an instrument approach.

5-61. POSITION INFORMATION

Inform the aircraft of its position at least once before starting final approach.

PHRASEOLOGY−
(Number) MILES (direction) OF (aerodrome name) AERODROME,

o r

(number) MILES (direction) OF (aerodrome name) AERODROME ON DOWNWIND/BASE LEG.

5-62. FINAL CONTROLLER CHANGEOVER

When instructing the aircraft to change frequency for final approach guidance, include the name of the unit.

PHRASEOLOGY−
CONTACT (name of unit) FINAL CONTROLLER ON (frequency).

5-63. COMMUNICATIONS CHECK

On initial contact with the final controller, ask the aircraft for a communication check.

PHRASEOLOGY−
(Aircraft call sign), (name of unit) FINAL CONTROLLER. HOW DO YOU HEAR ME?

5-64. TRANSMISSION ACKNOWLEDGEMENT

After contact has been established with the final controller and while on the final approach course, instruct the aircraft not to acknowledge further transmissions.

PHRASEOLOGY−
DO NOT ACKNOWLEDGE FURTHER TRANSMISSIONS

5-65. MISSED APPROACH

Before an aircraft starts final descent for a full stop landing and weather reports indicate that any portion of the final approach will be conducted in IFR conditions, issue a specific missed approach procedure approved for the radar approach being conducted.

PHRASEOLOGY−
YOUR MISSED APPROACH PROCEDURE IS (missed approach procedure).

5-66. LOW APPROACH AND TOUCH-AND-GO

Before an aircraft which plans to execute a low approach or touch-and-go begins final descent, issue appropriate departure instructions to be followed upon completion of the approach. Climb-out instructions must include a specific heading and altitude except when the aircraft will maintain VFR and contact the tower.

PHRASEOLOGY−
AFTER COMPLETING LOW APPROACH/TOUCH AND GO:

CLIMB AND MAINTAIN (altitude).

TURN (right or left) HEADING (degrees)/FLY RUNWAY HEADING,

o r

MAINTAIN VFR, CONTACT TOWER, or

(other instructions as appropriate).

NOTE−This may be omitted after the first approach if instructions remain the same.

5-67. TOWER CLEARANCE

1. When an aircraft is on final approach to an aerodrome served by a tower, obtain a clearance to land, touch-and-go, or make low approach. Issue the clearance and the surface wind to the aircraft.

2. If the clearance is not obtained or is canceled, inform the aircraft and issue alternative instructions.

PHRASEOLOGY−
TOWER CLEARANCE CANCELED/NOT RECEIVED (alternative instructions).

5-68. Final Approach Abnormalities

Instruct the aircraft if runway environment not in sight, to execute a missed approach if previously given; or climb to or maintain a specified altitude and fly a specified course whenever the completion of a safe approach is questionable because one or more of the following conditions exists.

EXAMPLE−
Typical reasons for issuing missed approach instructions:
"Radar contact lost."
"Too high/low for safe approach."
"Too far right/left for safe approach."

1. Safety limits are exceeded or radical target deviations are observed.

2. Position or identification of the aircraft is in doubt.

3. Radar contact is lost or malfunctioning radar is suspected.

PHRASEOLOGY−
(Reason) IF RUNWAY/APPROACH LIGHTS/RUNWAY LIGHTS NOT IN SIGHT, EXECUTE MISSED APPROACH/ (alternative instructions).

NOTE−If the pilot requests, approval may be granted to proceed with the approach via ILS or another navigational aid/approach aid.

4. Aerodrome conditions or traffic preclude approach completion.

PHRASEOLOGY−
EXECUTE MISSED APPROACH/ (alternative instructions), (reason).

5-69. SURVEILLANCE Approaches Altitude Information

Provide recommended altitudes on final approach if the pilot requests. If recommended altitudes are requested, inform the pilot that recommended altitudes which are at or above the published MDA will be given for each mile on final.

PHRASEOLOGY−
RECOMMENDED ALTITUDES WILL BE PROVIDED FOR EACH MILE ON FINAL TO MINIMUM DESCENT ALTITUDE/CIRCLING MINIMUM DESCENT ALTITUDE.

5-70. Surveillance Approaches Visual Reference Report

Aircraft may be requested to report the runway, approach/runway lights, or aerodrome in sight. Helicopters making a "point-in-space" approach may be requested to report when able to proceed to the landing area by visual reference to a prescribed surface route.

PHRASEOLOGY−
REPORT (runway, approach/runway lights or aerodrome) IN SIGHT.

REPORT WHEN ABLE TO PROCEED VISUALLY TO AERODROME/HELIPORT.

5-71. SURVEILLANCE Approaches Descent Notification

1. Issue advance notice of where descent will begin and issue the straight-in MDA prior to issuing final descent for the approaches.

NOTE−The point at which descent to the minimum descent altitude is authorized is the final approach fix unless an altitude limiting stepdown-fix is prescribed.

2. When it is determined that the surveillance approach will terminate in a circle to land maneuver, request the aircraft approach category from the pilot. After receiving the aircraft approach category, provide him/her with the applicable circling MDA prior to issuing final descent for the approach.

NOTE−Pilots are normally expected to furnish the aircraft approach category to the controller when it is determined that the surveillance approach will terminate in a circle to land maneuver. If this information

is not voluntarily given, solicit the aircraft approach category from the pilot, and then issue him/her the applicable circling MDA.

PHRASEOLOGY−
PREPARE TO DESCEND IN (number) MILE(S).

for straight-in approaches,

MINIMUM DESCENT ALTITUDE (altitude). *for circling approaches,*

REQUEST YOUR AIRCRAFT APPROACH CATEGORY. (Upon receipt of aircraft approach category), PUBLISHED CIRCLING MINIMUM DESCENT ALTITUDE (altitude).

5-72. SURVEILLANCE APPROACHES DESCENT INSTRUCTIONS

When an aircraft reaches the descent point, issue one of the following as appropriate:

1. Unless a descent restriction exists, advise the aircraft to descend to the MDA.

PHRASEOLOGY−
(Number) MILES FROM RUNWAY/AERODROME/HELIPORT. DESCEND TO YOUR MINIMUM DESCENT ALTITUDE.

2. When a descent restriction exists, specify the prescribed restriction altitude. When the aircraft has passed the altitude limiting point, advise to continue descent to MDA.

PHRASEOLOGY−
(Number) MILES FROM RUNWAY/AERODROME/HELIPORT. DESCEND AND MAINTAIN (restriction altitude).

DESCEND TO YOUR MINIMUM DESCENT ALTITUDE

5-73. SURVEILLANCE APPROACHES FINAL COURSE GUIDANCE

1. Issue course guidance, inform the aircraft when it is on course, and frequently inform the aircraft of any deviation from course. Transmissions with aircraft on surveillance final approach should occur approximately every 15 seconds.

PHRASEOLOGY− HEADING (heading),

ON COURSE, or

SLIGHTLY/WELL LEFT/RIGHT OF COURSE.

NOTE−
Controllers should not key the radio transmitter continuously during radar approaches to preclude a lengthy communications block. The decision on how often transmitters are unkeyed is the controller's prerogative.

2. Issue trend information, as required, to indicate target position with respect to the extended runway centerline and to describe the target movement as appropriate corrections are issued. Trend information may be modified by the terms "RAPIDLY" and "SLOWLY" as appropriate.

EXAMPLE−
"Going left/right of course."
"Left/right of course and holding/correcting."

3. Inform the aircraft of its distance from the runway, aerodrome/heliport, or MAP, as appropriate, each mile on final.

PHRASEOLOGY−
(Number) MILE(S) FROM RUNWAY/AERODROME/HELIPORT OR MISSED APPROACH POINT.

4. Recommended altitudes must be furnished, if requested, in accordance with paragraph 5-67, Altitude Information.

5-74. APPROACH GUIDANCE TERMINATION

1. Discontinue surveillance approach guidance when:

a. Requested by the pilot.

b. In your opinion, continuation of a safe approach to the MAP is questionable.

c. The aircraft is over the MAP.

2. Surveillance approach guidance may be discontinued when the pilot reports the runway or approach/runway lights in sight or if a "point- in-space" approach, he/she reports able to proceed to the landing area by visual reference to a prescribed surface route.

APPROACH/RUNWAY LIGHTS NOT IN SIGHT, EXECUTE MISSED APPROACH/ (missed approach instructions). (Additional instructions/clearance, as required.)

(Distance and direction) FROM AERODROME/HELIPORT/MISSED APPROACH POINT.

IF UNABLE TO PROCEED VISUALLY, EXECUTE MISSED APPROACH. (Additional instructions/clearance, if required.)

NOTE−Terminal instrument approach procedures and flight inspection criteria require establishment of a MAP for each procedure including the point to which satisfactory radar guidance can be provided.

3. When approach guidance is discontinued in accordance with subparagraph a and the aircraft has reported the runway or approach/runway lights in sight, advise the aircraft of its position and to proceed visually.

PHRASEOLOGY−
(Distance) MILE(S) FROM RUNWAY/AERODROME/ HELIPORT,

o r

OVER MISSED APPROACH POINT.

PROCEED VISUALLY (additional instructions/clearance as required.)

4. When approach guidance is discontinued in accordance with subparagraph a above and the aircraft has not reported the runway or approach/runway lights in sight, advise the aircraft of its position and to execute a missed approach unless the runway or approach/ runway lights are in sight or, if a "point-in-space" approach, unless able to proceed visually.

PHRASEOLOGY−
(Distance) MILE(S) FROM RUNWAY,

or

OVER MISSED APPROACH POINT. IF RUNWAY,
o r
ALTITUDE SHOULD BE (altitude).

5-75. AUTOMATED RADAR TERMINAL SYSTEMS (ARTS) APPLICATION

ARTS may be used for identifying aircraft assigned a discrete beacon code, maintaining identity of targets, and performing handoffs of these targets between controllers.

5-76. ARTS RESPONSIBILITY

This equipment does not relieve the controller of the responsibility to ensure proper identification, maintenance of identity, handoff of the correct target associated with the alphanumeric data, and separation of aircraft.

5-77. ARTS FUNCTIONAL USE

In addition to other uses specified herein, terminal automation may be used for the following functions:

1. Tracking.

2. Tagging.

3. Handoff.

4. Altitude information.

5. Coordination.

6. Ground speed.

7. Identification.

5-78. ARTS SYSTEM REQUIREMENTS

Use terminal automation systems as follows:

1. Inform all appropriate positions before terminating or reinstating use of the terminal automation system at a control position. When terminating the use of terminal automation systems, all pertinent flight data of that position must be transferred or terminated.

2. Inform other interfaced facilities of scheduled and unscheduled shutdowns.

3. Initiate a track/tag on all aircraft to the maximum extent possible. As a minimum, aircraft identification should be entered, and automated handoff functions should be used.

4. Assigned altitude, if displayed, must be kept current at all times. Climb and descent arrows, where available, must be used to indicate other than level flight.

5. The automatic altitude readout of an aircraft under another controller's jurisdiction may be used for vertical separation purposes without verbal coordination provided:

   a. Operation is conducted using single site radar coverage.

   b. Do not use Mode C to effect vertical separation within a Mosaic radar configuration.

5-79. ARTS INFORMATION DISPLAYED

1. Two-letter ICAO designators or three-letter designators, as appropriate, must be used unless programme limitations dictate the use of a single letter alpha prefix.

2. Use of the inhibit/select functions to remove displayed information no longer required must be in accordance with local directives, which should ensure maximum required use of the equipment.

3. Information displayed must be in accordance with national orders and specified in local directives.

5-80. CA/MCI

1. When a CA or MCI alert is displayed, evaluate the reason for the alert without delay and take appropriate action.

2. If another controller is involved in the alert, initiate coordination to ensure an effective course of action. Coordination is not required when immediate action is dictated.

3. Suppressing/Inhibiting CA/MCI alert.

a. The suppress function may be used to suppress the display of a specific CA/MCI alert.

b. The inhibit function must only be used to inhibit the display of CA for aircraft routinely engaged in operations where standard separation criteria do not apply.

c. Computer entry of a message suppressing a CA/MCI alert constitutes acknowledgment for the alert and signifies that appropriate action has or will be taken.

d. CA/MCI alert may not be suppressed or inhibited at or for another control position without being coordinated.

5-81. INHIBITING SAFE ALTITUDE WARNING (MSAW)

1. Inhibit MSAW processing of VFR aircraft and aircraft that cancel instrument flight rules (IFR) flight plans unless the pilot specifically requests otherwise.

2. A low altitude alert may be suppressed from the control position. Computer entry of the suppress message constitutes an acknowledgment for the alert and indicates that appropriate action has or will be taken.

5-82. TRACK SUSPEND FUNCTION

Use the track suspend function only when data block overlap in holding patterns or in proximity of the final approach create an unworkable situation. If necessary to suspend tracks, those which are not displaying automatic altitude readouts must be suspended. If the condition still exists, those displaying automatic altitude readouts may then be suspended.

CHAPTER 6. AERODROME SERVICES

6-1. GENERAL

1. An Aerodrome Control unit shall provide:

a. Aerodrome Control Service.

b. Basic Service.

c. Alerting Service when:
i. An aircraft accident has occurred in the vicinity of the aerodrome.
ii. Information is received that an aircraft which is or will come under the jurisdiction of the aerodrome.
iii. When requested by the aircraft or;
iv. When deemed necessary.

2. An Aerodrome Control unit provides services principally to aircraft flying with visual reference to the surface in, and in the vicinity of, the ATZ and operating on the maneuvering area. It is normally a separate unit but may be combined, either temporarily or permanently, with an Approach Control unit.

6-2. RESPONSIBILITIES OF THE AERODROME

1. Aerodrome Control is responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly, and expeditious flow of air traffic and to assist pilots in preventing collisions between:

a. Aircraft flying in, and in the vicinity of, the ATZ.
b. Aircraft taking off and landing.
c. Aircraft moving on the apron; and
d. Aircraft and vehicles, obstructions, and other aircraft on the maneuvering area.

2. In order to execute his duties the Ground ATCO has authority over aircraft, vehicles, and personnel on the maneuvering area and aircraft moving on the apron.

3. Aerodrome Control is divided into Local Control and Ground Control.

4. Local Control shall provide services for a and b above and has absolute authority over all movements on active runways and their access points.

5. Ground Control shall provide services for c and d above except on active runways and their access points.

6. In addition, Aerodrome Control has the following specific responsibilities:

a. Alerting the aerodrome safety services, and if necessary, inform aircraft under its control of any depletion of those services.
b. Providing an Approach Control Service when carrying out functions delegated by Approach Control; and
c. Supplying the following information to Approach Control and, according to unit instructions, Approach Radar Control:
i. Pertinent data on IFR, Special VFR, and VFR traffic including departures, missed approaches, and overdue aircraft.
ii. Appropriate items of essential aerodrome information.

7. Inform the Aerodrome Operator when it becomes apparent that there is deterioration in the state of the aerodrome or associated facilities for which the Aerodrome Operator is responsible; and

8. Initiating overdue action at aerodromes where no Approach Control unit is established.

9. Approach Control may instruct approaching IFR flights to contact Aerodrome Control before transfer of control has become effective. Until approaching aircraft are flying with visual reference to the surface, Aerodrome Control shall not issue any instructions or advice which would reduce the separation established by Approach Control.

6-3. COORDINATION

1. Aerodrome Control shall co-ordinate with Approach Control:
a. Departing IFR flights (CAD has made provisions between approach and aerodrome for automatic departures, subsequently manual coordination is not necessary); and
b. Arriving aircraft which make their first call on the tower frequency (usually aircraft whose initial call-up is on tower frequency are instructed to call approach control for sequencing and clearance).

6-4. TRANSFER OF CONTROL

1. The responsibility for control of a departing aircraft shall be transferred from Aerodrome Control to Approach Control:
a. In VMC: prior to the aircraft leaving the vicinity of the aerodrome, or prior to the aircraft entering IMC; and
b. In IMC: immediately after the aircraft is airborne.
c. When aerodrome control transfers frequency communications.

6-5. INFORMATION TO AIRCRAFT

1. Aircraft under the jurisdiction of Aerodrome Control must be kept informed of any significant changes that could affect any stage of the aircraft's flight. For example:
a. Significant changes in meteorological and runway conditions.
b. Changes in essential aerodrome information; and
c. Changes in the notified operational status of approach and landing aids.

2. Essential Aerodrome Information is information that may constitute a hazard to a aircraft. It shall be issued to pilots in sufficient time to ensure the safe operation of aircraft. This may include the provision of urgent information to pilots during aircraft take-off and landing runs. Essential aerodrome information shall include:

a. Construction work or maintenance on the maneuvering area.

b. Rough portions of the maneuvering area and whether marked or not.

c. Failure or irregular functioning of the aerodrome lighting system. Defects must be passed to pilots in the form that they have been reported to the ATCO. ATCOs should not make assumptions that a particular defect renders an associated aid unserviceable or not available. The pilot is responsible for deciding his course of action.

d. Failure or irregular functioning of approach aids.

e. Aircraft parked close to the runways or taxiways and aircraft engaged in ground running of engines; and

f. Bird formations or individual large birds reported or observed on or above the maneuvering area or in the immediate vicinity of the aerodrome and the extent of any bird dispersal action being carried out. When flocks of birds or single large ones are seen, the Aerodrome Operator or Bird Control Unit must be informed.

g. NOTAMS, SIGMETS and other reported information available to the ATCO.

6-6. CONTROL OF SURFACE TRAFFIC

1. The movements of aircraft, persons, or vehicles on the maneuvering area and the movement of aircraft on the apron are subject to permission from Aerodrome Control.

2. Aerodrome Control responsibility on the apron is limited to providing advice and instructions to assist the prevention of collisions between moving aircraft.

3. Vehicles moving along a runway or taxiway shall give way at all times to aircraft taking off, landing, taxiing, or being towed, except that emergency services vehicles proceeding to the assistance of an aircraft in distress shall be afforded priority over all other surface movement traffic. In the latter case, all movement of surface traffic should, to the extent practicable, be halted until it is determined that the progress of the emergency vehicles will not be impeded.

4. Crossing Runway: Aircraft and vehicles are authorized to cross runways only after the approval of the Aerodrome ATCO.

6-7. GENERAL RUNWAY PROCEDURES

1. Vehicles fitted with appropriate equipment operating on an active runway, e.g., during runway inspection or short-term maintenance, are to be transferred to an RTF frequency which will enable them to hear transmissions to and from aircraft using that runway.

2. In conditions of low visibility where non-radio-equipped aircraft and vehicles cannot be controlled by light signals, the movement on the maneuvering area of all such aircraft and vehicles, except emergency services vehicles, should normally be prohibited.

3. When issuing instructions and clearances on the aerodrome, ATCOs must take into account the hazards of jet blast and propeller slipstream. Even at ground idle. large aircraft can produce localized wind velocities of sufficient strength to cause damage to other aircraft, vehicles, and personnel operating within the affected area. Particular care should be taken when multiple line-up clearances at different points on the same runway are issued and aircraft later in the departure sequence will be subjected to jet blast or propeller slipstream from preceding departures.

Note: Research has demonstrated that the affected area behind a large aircraft with engines at ground idle extends up to 600 metres.

6-8. TAXIING AIRCRAFT

1. When the pilot of an aircraft requests start-up or taxi clearance, the following information shall be given:

a. Runway in use.
b. Surface wind direction and speed, including significant variations; and
c. Significant meteorological conditions, e.g., RVR or marked temperature inversion.

2. Taxi Clearance

a. The importance of issuing clear and concise instructions to taxiing aircraft cannot be over-emphasized. The visibility from an aircraft flight deck is limited and, when taxiing, the pilot is dependent to a large degree upon Aerodrome Control to assist him in determining the correct taxi route to be followed.
b. Heavy aircraft are not to be given clearance or instructions that would require the use of more than normal power for taxiing or for entry on to the runway. Heavy aircraft, when at the holding position, are not to be cleared for an immediate take-off.

3. Aircraft Taxi Clearance Limit

a. In addition to providing instructions about the route to be followed, all taxi clearances are to contain a specific clearance limit. This clearance limit should be a location on the maneuvering area or apron.
b. Care must be exercised when clearing an aircraft to the holding point of the runway- in-use, for the aircraft is then permitted to cross all runways which intersect the taxi route designated in the clearance whether active or not. Therefore, when a taxi clearance contains a taxi limit beyond a runway, it is to contain an explicit clearance to cross that runway.

4. To expedite air traffic aircraft can be cleared to taxi on the runway in use, provided no delay or risk to other aircraft will result. The use of the active runway for taxiing aircraft shall

be approved by the local controller. Communication with the aircraft shall be transferred to local controller before the aircraft enters the runway.

5. Aircraft Awaiting Take-off

a. Aircraft shall not be permitted to hold on the end of the runway if another aircraft has been cleared to land.

b. To guard against pilots misinterpreting a clearance message as permission to take off, after an aircraft has been instructed to hold at a runway holding position and a clearance message is passed, the clearance message shall be prefixed with a repetition of the appropriate holding instruction.

6-9. TAKE-OFF CLEARANCE PROCEDURES

1. The aerodrome ATCO is responsible for issuing take-off clearance and advising pilots of any variations to the surface wind or other significant changes to meteorological conditions.

2. When multiple runways are in use and possibility of confusion exists, the take-off clearance shall include the designator of the departure runway.

3. Take-off clearance may be issued when the aircraft is at or approaching the holding position for the runway in use or when the aircraft is lined up on or entering the runway in use. ATCOs may include holding position designators in any clearance to take-off as considered appropriate.

4. A take-off clearance shall be issued separately from any other clearance message. If an aircraft is lined up on the runway and a revised clearance or post departure instructions need to be passed, the revised clearance or post departure instructions shall be prefixed with an instruction to hold position.

5. An aircraft shall not be permitted to begin take-off until the preceding departing aircraft is seen to be airborne or has reported “airborne” by RTF and all preceding landing aircraft have vacated the runway in use.

6. Departure Clearances

a. If an ATC clearance could initially be confused with a ground movement instruction (e.g., a turn) or otherwise to avoid pilots taking off without a take-off clearance, it should commence with the phrase “after departure” to ensure clarity.

b. An aircraft on an IFR flight is not to be given take-off clearance until Approach Control has authorized its departure (this sub-paragraph is only in effect when the automatic departure procedure is not being used) and any specific instructions have been passed to the aircraft, e.g.:

i. Turn after take-off.

ii. Track to make good before turning onto desired heading; and

iii. Level(s) to maintain.

7. Departing aircraft shall normally be cleared in the order they request clearance, however exceptions can be made to this rule to expedite the number of departures and minimize delay.

8. Departures can be expedited by suggesting a take-off direction which is not into the wind. If departures are delayed, the delayed flights will be cleared in the order requested unless an operational advantage can be gained. Aircraft operators should be advised when delays are expected to exceed 30 minutes.

9. Wake Turbulence; The pilot of a departing aircraft may request a delay in take-off because of the danger of wake turbulence from the preceding aircraft. There is a particular danger for aircraft commencing the take-off run part of the way along the runway.

10. Cancelling Take-off Clearance

a. If take-off clearance has to be cancelled before the take-off run has commenced, the pilot shall be instructed to hold position and to acknowledge the instruction.

b. In certain circumstances, the aerodrome ATCO may consider that it is necessary to cancel take-off clearance after the aircraft has commenced the take-off run. In this event, the pilot shall be instructed to stop immediately and to acknowledge the instruction. The cancellation of a take-off clearance after an aircraft has commenced its take-off roll should only occur when the aircraft will be in serious and imminent danger should it continue.

PHRASEOLOGY−

CANCEL TAKEOFF CLEARANCE (reason).

6-10. DESIGNATED POSITIONS IN THE TRAFFIC CIRCUIT

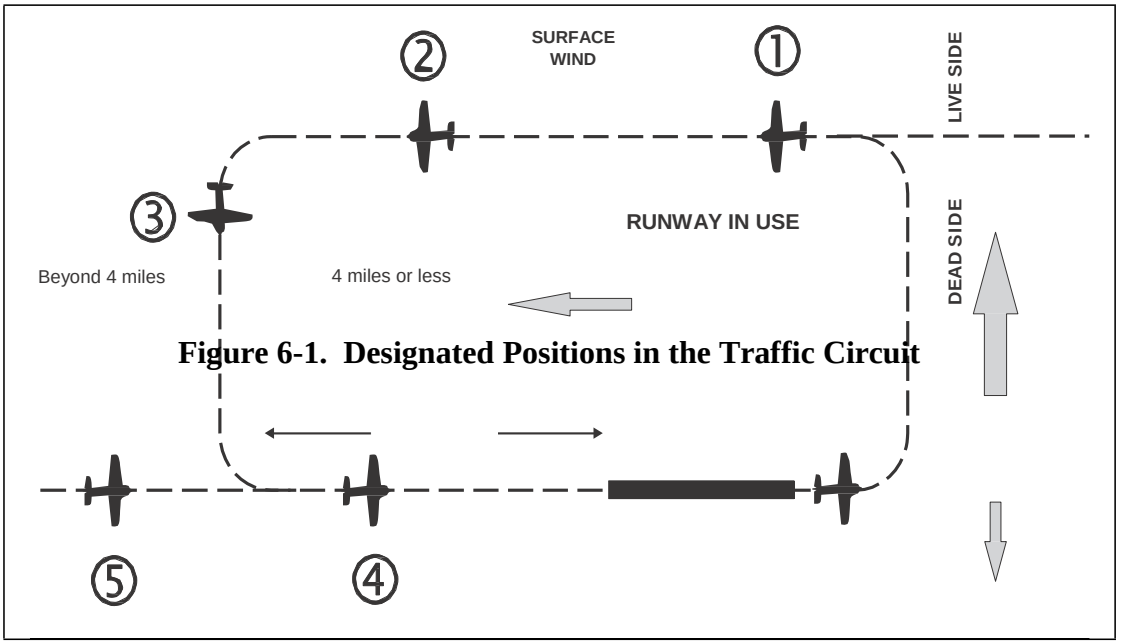


Figure 6-1. Designated Positions in the Traffic Circuit

Position 1. Aircraft reports on “downwind” leg when abeam upwind end of the runway.

Position 2. Aircraft reports “late downwind” if it is on the downwind leg, has been unable to report “Downwind” and has passed the downwind end of the runway.

Position 3. Aircraft reports "base" leg (if required).
Position 4. Aircraft reports "final". Clearance to land issued here.
Position 5. Aircraft reports "long final" (between 8 and 4 miles) when aircraft is on a straight-in approach.

Note: For light aircraft operations, circuit dimensions may be reduced, but the relative RTF reporting points are maintained.

6-11. ARRIVING AIRCRAFT

1. Clearance to enter a traffic circuit is issued by the approach control in enough time to enable the pilot to conform with the traffic circuit, pending clearance to land. Information concerning landing direction or runway in use and any other necessary instructions are given at the same time so that the pilot may intelligently position himself in the traffic pattern. Approach control is responsible for the sequencing of aircraft for landing therefore all aircraft must be in contact with approach control before aerodrome control.

2. Aircraft shall be landed in according with the priority stated in paragraph 4-10 of this directive.

3. Aircraft landing or in the final stages of approach shall normally have priority over departing aircraft.

4. Aircraft Landing Procedures

a. When multiple runways are in use and possibility of confusion exists, the landing clearance shall include the designator of the landing runway.

b. Unless specific procedures have been approved by the CAD, a landing aircraft shall not be permitted to cross the beginning of the runway on its final approach until a preceding aircraft, departing from the same runway, is airborne.

c. When aircraft are using the same runway, a landing aircraft may be permitted to touch down before a preceding landing aircraft, which has landed, is clear of the runway provided that:

i. The runway is long enough to allow safe separation between the two aircraft and there is no evidence to indicate that braking may be adversely affected.

ii. It is during daylight hours and weather conditions are VMC.

iii. The preceding landing aircraft is not required to backtrack in order to vacate the runway.

iv. The ATCO is satisfied that the landing aircraft will be able to see the preceding aircraft which has landed, clearly and continuously, until it has vacated the runway; and

v. The pilot of the following aircraft is warned. Responsibility for ensuring adequate separation rests with the pilot of the following aircraft.

d. A landing aircraft, which is considered by an ATCO to be dangerously positioned on final approach, shall be instructed to carry out a missed approach. An aircraft can be considered as dangerously positioned when it is poorly placed either laterally or vertically for the landing runway.

5. Landing Direction and Runway-in-Use

a. The term "runway-in-use" is used to indicate the particular runway or landing direction selected by Aerodrome Control as the most suitable at any particular time. Normally, the runway-in-use selected should be that most closely aligned to the surface wind direction.

b. When selecting the runway-in-use, Aerodrome Control shall take into consideration other factors such as traffic pattern, the length of runways or landing runs, approach aids available, and any meteorological conditions which may be significant to the choice of runway. At certain aerodromes, more than one runway may be in use at any one time.

c. There are numerous reasons for using an out of wind runway; for example, operations, efficiency, and noise abatement.

6. Out of Wind Runway

a. A runway may be nominated for noise abatement purposes, the objective being to utilize whenever possible those runways that permit airplanes to avoid noise-sensitive areas during the initial departure and final approach phases of flight.

b. If the pilot, prompted by safety concerns, considers that a runway offered, including those for noise abatement purposes, is not suitable, he may refuse that runway and request permission to use another. In such circumstances, ATCOs shall inform pilots of the expected delay necessary to facilitate a change of runway.

7. Landing roll-out procedures; When necessary or operationally desirable a landing aircraft may be requested to:

a. Hold short of an intersecting runway after landing.

b. Land beyond the touchdown zone of the runway.

c. Vacate the runway at a specified exit runway.

d. Expedite vacating the runway.

8. When requesting an aircraft to execute a roll-out maneuver aerodrome characteristics shall be taken into account. Heavy aircraft shall never be requested to land beyond the touchdown zone of a runway. The pilot shall notify the ATCO if unable to execute the requested maneuver.

6-12. RUNWAY CHANGES

1. Should a change of runway be necessary, Aerodrome Control, after consultation with Approach Control, shall inform the following:

a. Aircraft under aerodrome control.

b. Contractors working on the aerodrome who will be affected by the change.

6-13. CLOSURE OR RESTRICTED OPERATION OF AERODROMES

1. The Aerodrome Operator is responsible for decisions regarding the operational status of the (CAD functions as the Aerodrome Operator for purposes of this directive) aerodrome including the apron and maneuvering area in respect of:

a. Routine operational limitations, e.g., runway maintenance.

b. Unforeseen hazards to aircraft operations, e.g., deteriorating surface conditions, obstructions, etc. Specifically, the Aerodrome Operator will make decisions regarding:

i. The closure or re-opening of the aerodrome.

ii. The withdrawal or return to use of runways, taxiways, and associated lighting aids.

iii. The revision of declared distances.

iv. Any marking required in connection with the above; and

v. Initiating NOTAM action to promulgate changes in serviceability.

2. Responsibilities of the ATC Unit

a. The Aerodrome Operator shall be informed immediately when it becomes apparent from reports or observations that there is a hazard to the movement of aircraft on the apron or maneuvering area.

b. The pilot will be advised of the position and nature of the obstruction. It is the responsibility of the pilot to decide whether or not to continue operations.

3. Work on the Maneuvering Area

a. When repair or installation work, authorized by the Aerodrome Operator, is to take place on the maneuvering area, a representative of the working party must be briefed by ATC or the Aerodrome Operations team about subjects relating to the proposed work, for example:

i. Methods of access to working area.

ii. The area in which vehicles may operate.

iii. The runway-in-use and the effects of any changes.

iv. Methods of obtaining permission to cross the runway in use; and

v. Signals or methods of indicating that vehicles and personnel must leave the maneuvering area.

b. The representative of the working party should possess an authorization to work on the aerodrome issued by the Aerodrome Operator. This is to be counter-signed by the senior ATCO, subsequent to the briefing, and a copy retained or a record of the briefing entered in the ATC Watch Log.

6-14. WINDSHEAR

1. Windshear is a sustained change in the wind velocity along the aircraft flight path, which occurs significantly faster than the aircraft can accelerate or decelerate. Windshear can occur at any level, but it is low-level windshear, occurring from the surface to a height of approximately 1500 feet which can cause problems of sufficient magnitude to affect the control of aircraft in departure or final approach phases of flight.

2. Conditions Conducive to windshear; ATCOs should be alert to the possibility of the existence of windshear in the following circumstances:

a. The presence of frontal/squall/thunderstorm activity in the vicinity of the aerodrome.

b. The presence of low-level inversions where the surface wind will be significantly different from that at only a few hundred feet above the ground.

c. Local terrain or buildings considered in relation to wind speed and direction; such large obstructions can cause windshear, as well as the more usual turbulence gusts.

3. Effects of Windshear; A combination of factors can make the analysis of windshear very complex, but three simple examples of the hazards of low-level windshear are shown below:

a. As the aircraft flies from A to B and traverses the windshear line, the inertia of the aircraft maintains the ground speed of 170 kt and the change of wind vector causes a sudden fall in airspeed. This can result in reduced lift until the inertia of the aircraft has been overcome and the original airspeed regained. Clearly this may be hazardous at critical climb-out speeds.

b. If an aircraft on final approach passes through a windshear line which causes a sudden loss of airspeed and a consequent increase in the rate of descent, a rapid application of power will be required if the aircraft is not to sink to a dangerously low height.

c. If the aircraft passes through a windshear line from a tailwind to a headwind component, the inertia of the aircraft results initially in an increased airspeed and a deviation above the glidepath. The pilot's instinctive power reduction can result in the aircraft being short of power with a high rate of descent as the glidepath is approached and the effect of the inertia is lost. A rapid increase of power is now required if the aircraft is not to sink below the glidepath at a dangerously low altitude.

4. Due to the need to maintain both a safe margin above the stalling speed and a clearly defined flight profile, particularly during the climb-out and approach phases of flight, sudden changes in airspeed must be countered very rapidly.

5. ATC Action; Whenever a pilot reports windshear conditions to ATC, the information shall be relayed to subsequent inbound and outbound aircraft until confirmation is received either from aircraft or the meteorological office that the condition no longer exists. Reports from pilots should contain the following information:

a. A warning of the presence of windshear.

b. The height or height band where the shear was encountered.

c. The time at which it was encountered; and

d. Details of the effect of the windshear on the aircraft e.g., speed gain or loss, vertical speed tendency, change in drift.

6. At aerodromes where ATIS is available, windshear information shall be included in the broadcasts. ATCOs should amplify the information for individual aircraft if necessary.

6-15. VISIBILITY

1. Prevailing visibility is defined as the visibility value that is reached or exceeded within at least half the horizon circle or within at least half of the surface of the aerodrome. These areas could comprise contiguous or non-contiguous sectors.

a. Reporting of Prevailing Visibility

i. The prevailing visibility at an observing station will always be reported. Where the visibility in any direction is less than the prevailing visibility (visibility value in at least 50% of reporting area from the observation point) the lowest visibility observed will also be reported. The general direction of the area of lower visibility will be indicated by

reference to one of the eight points of the compass. If the lowest visibility is observed in more than one direction, then the most operationally significant direction will be reported.
ii. When the visibility is fluctuating rapidly and the prevailing visibility cannot be determined, only the lowest visibility will be reported, with no indication of direction.

2. ATC Procedures

a. When verbally passing a report of visibility, e.g., as part of the aerodrome weather report passed to a pilot, the visibility should be transmitted as in current reports. (An example is shown below for reference.)

b. METAR EGxx 1250 1800 0800NE should be transmitted as "Weather at one two five zero, visibility one thousand eight hundred metres, eight hundred metres to the North East …."

c. Certain ATC procedures are implemented during specific visibility conditions. When two visibility values are present in a report, the lower of the two values shall be used to determine whether to implement such procedures.

6-16. WET RUNWAYS

1. It is recognized that a need exists to warn pilots of the presence of water on a runway. The Aerodrome Operator is responsible for assessing runway surface conditions. (For purposes of this directive, CAD ATC functions as the Aerodrome Operator.) When the presence of water on a runway is brought to the attention of the ATCO, the information shall be passed to aircraft.

2. Reporting Wet Runways; The presence, or otherwise, of surface water on a runway is to be reported on the RTF and ATIS, in plain language, using the following descriptions:

Reporting Term	Surface conditions
DRY	The surface is not affected by water. NOTE: Reports that the runway is dry are not normally to be passed to pilots. If no runway surface report is passed, pilots will assume the surface to be dry.
DAMP	The surface shows a change of color due to moisture. NOTE: If there is sufficient moisture to produce a surface film or the surface appears reflective, the runway will be reported as WET.

WET	The surface is soaked but no significant patches of standing water are visible. NOTE: Standing water is considered to exist when water on the runway surface is deeper than 3mm. Patches of standing water covering more than 25% of the assessed area will be reported as WATER PATCHES.
WATER PATCHES	Significant patches of standing water are visible. NOTE: Water patches will be reported when more than 25% of the assessed area is covered by water more than 3mm deep.
FLOODED	Extensive patches of standing water are visible. NOTE: Flooded will be reported when more than 50% of the assessed area is covered by water more than 3mm deep.

6-17. SUSPENSION OF VFR OPERATIONS

1. VFR operations may be suspended in the vicinity of the aerodrome by the following authorities:
   a. The approach control.
   b. The aerodrome control tower.
   c. The appropriate CAD authority.

2. All suspensions of VFR shall be coordinated through the aerodrome tower.

3. The following procedures shall be executed by the aerodrome tower when VFR is suspended:
   a. Hold VFR departures.
   b. Recall local flights operating under VFR or obtain approval for SVFR (see paragraph 6-18).
   c. Notify the approach control of actions taken and notify all aerodrome operators of the reason for the suspension.

6-18. SPECIAL VFR OPERATIONS

1. Special VFR operations are only authorized within the control zone.

2. Special VFR clearance is issued when requested by a pilot. Before issuing such a clearance, an ATCO must consider the prevailing traffic conditions, the extent of the

proposed flight, and the availability of air-ground communications. Special VFR (SVFR) flights are not to hinder normal IFR flights (ATCOs shall not offer or suggest SVFR).

3. With an Authorization for Special VFR, a pilot may fly VFR in the Control Zone (Controlled Airspace) with the same weather minimums (clear of clouds--one (1) mile flight visibility) as in uncontrolled airspace (during daylight hours only).

4. When an SVFR clearance is issued, ATC must provide standard separation between SVFR aircraft and other SVFR and IFR aircraft.

5. The SVFR aircraft must be cleared to maintain an altitude at or below an altitude which is at least 500 feet below any conflicting IFR traffic.

6. SVFR aircraft may be radar vectored as necessary for separation/sequencing but it should be kept in mind that the pilot must remain clear of clouds with one (1) mile flight visibility; therefore, the pilot may not be able to fly the vector heading.

7. SVFR aircraft must be coordinated with the approach control before issuing the clearance.

8. Pilots must:
   a. Comply with ATC instructions and inform ATCO's if unable.
   b. Be responsible for ensuring that his flight conditions enable him to remain clear of cloud, determine his flight path with reference to the surface and keep clear of obstructions.
   c. Be responsible for ensuring that he or she flies within the limitations of his/her license.
   d. Be responsible for complying with the relevant RoA low flying restrictions (other than the 1000 feet rule).

CHAPTER 7. APPROACH CONTROL

7-1. GENERAL

Approach Control Services within the CAD comprise surveillance and non-surveillance based ATS. The type of ATS to be provided depends on the classification of airspace within which the aircraft is flying as tabulated below:

Airspace	Services Provided	Remarks
Class D (Controlled Airspace)	Air Traffic Control Service with or without surveillance; Alerting Service.	Aircraft are required to comply with air traffic control instructions.

1. Within Controlled Airspace
   a. An Approach Control unit at an aerodrome within controlled airspace shall provide ATC Services to aircraft, according to the classification of the airspace within which the aerodrome is located, from the time and place at which:
      i. Aircraft approaching from outside controlled airspace place are under the control of Approach Control until control is transferred to Aerodrome Control.
      ii. Departing aircraft are taken over from Aerodrome Control until they are clear of controlled airspace; and
      iii. Overflying aircraft are within the relevant controlled airspace.

2. Outside Controlled Airspace
   a. An Approach Control unit at an aerodrome outside controlled airspace shall provide ATS to aircraft, as determined by the Aerodrome Operator and approved by the CAD, from the time and place at which:
      i. Arriving aircraft place themselves under the control of Approach Control until control is transferred to Aerodrome Control.
      ii. Departing aircraft are taken over from Aerodrome Control until they no longer wish to receive a service. Overflying aircraft place themselves under the control of Approach Control until they are clear of the approach pattern and no longer wish to receive a service.

7-2. INFORMATION TO AIRCRAFT/ATSUS

1. Traffic Information and Avoidance
   a. Traffic information shall be passed and traffic avoidance advice given to aircraft on any occasion that an ATCO considers it necessary in the interests of safety.

b. ATCOs at aerodromes located in Class D airspace are to pass traffic information as shown in the table below.

Aerodrome Located in Airspace	Traffic Information to be Passed
Class D	a) to IFR flights on VFR flights*; b) to VFR flights on IFR flights; c) to VFR flights on other VFR flights; d) to VFR flights on Special VFR flights;

*Traffic avoidance advice must be given if requested.

Note: Mixed VFR and Special VFR operations can occur within Class D Airspace as a result of the different VMC criteria for different aircraft categories and the limitations of a pilot's license.

2. Flight Information

a. Approach Control shall provide flight information to aircraft under its control; in particular any failure or irregular functioning of the aerodrome lighting system or approach aid.

3. Information to Other Units

a. Aerodrome Control

i. Approach Control shall supply the following information to Aerodrome Control:

(1) Pertinent data on all relevant flights including the type of flight, i.e., IFR or VFR (workload permitting), level of arriving aircraft, and ETA.

(2) The anticipated order in which control of aircraft is to be transferred; and

(3) The anticipated delay to departing IFR flights together with the reason for the delay.

7-3. COORDINATION/TRANSFER OF CONTROL AND COMMUNICATION

1. Aerodrome Control

a. Approach Control shall co-ordinate with Aerodrome Control:

i. Aircraft approaching to land, if necessary, requesting clearance to land.

ii. Arriving aircraft which are to be cleared to visual holding points; and

iii. Aircraft routing through the traffic circuit.

2. Transfer of Communication

a. Aerodrome Control

i. Approach Control may instruct IFR flights to establish communication with Aerodrome Control (for the purpose of obtaining landing clearance and essential aerodrome information) when the aircraft has become number one to approach and, for following aircraft, when they

are established on final approach and have been provided with appropriate separation. Until such aircraft are flying with visual reference to the surface, the responsibility for separation between them shall remain with Approach Control. Aerodrome Control shall not issue any instructions or advice that would reduce the separation established by Approach Control.

b. VFR Flights

i. Approach Control shall retain all arriving VFR flights under its jurisdiction until appropriate traffic information on IFR flights and other VFR flights has been issued and co-ordination effected with Aerodrome Control.

ii. Approach Control must ensure that VFR flights are transferred in sufficient time for Aerodrome Control to pass additional information in respect of local traffic.

iii. When the reported visibility consists of two values, the lower of the two values shall be used when determining whether to implement the above procedures.

7-4. ARRIVING AIRCRAFT

1. Terrain Clearance

a. The assigned level in initial clearances to arriving aircraft should normally not be below the appropriate minimum sector altitude, or if this is not known, the highest minimum sector altitude. If a pilot is flying at, or has requested a lower level or has confirmed that he is in a position to accept an ATC clearance at a lower level, a reminder of the highest sector altitude should be issued.

b. This instruction does not apply where altitudes to be assigned on particular routes have been specifically approved by the CAD.

2. Radar Release; It should be noted that when an aircraft is the subject of a ‘‘radar release’’ the approach ATCO shall not control it until the approach radar ATCO reports that it is clear of the conflicting traffic.

7-5. ARRIVAL CLEARANCE CONTENTS

1. Standard clearances for arriving aircraft shall contain the following items:

a. Aircraft identification.

b. Approach to be flown.

c. Runway-in-use except when part of the approach flown.

d. Initial altitude.

e. Any other pertinent instructions.

7-6. LANDING AND TAKE-OFF MINIMA

All personnel, licenced as air traffic ATCOs, shall adhere to the following:

1. Utilizing known visual geographical locations, assess the visibility when it has been observed to be below four (4) miles.

2. Enter information on Unit Log.

3. Advise the Watch Supervisor (WS), TRACON, FIC, and the Meteorological Office as appropriate.

4. When PIREPs, provide information on the ceiling, and if it is below 1,500 feet, steps b. and c. should be taken.

5. When after the Local ATCO or Meteorological Office has determined the prevailing visibility to be below three (3) miles, but not below one (1) mile, the following procedures shall be undertaken:

a. Transmit the visibility to aircraft on the approach; and

b. Advise the pilot if he has his minimum, he is cleared to land.

EXAMPLE: Phraseology. "(aircraft identification) VISIBILITY TWO MILES (any other pertinent landing data), IF YOU HAVE YOUR MINIMA, CLEARED TO LAND. ADVISE/STATE INTENTIONS".

6. When the Local ATCO or MET Officer has determined the prevailing visibility to be below one (1) mile:

a. Enter information on Unit Log.

b. Advise the Watch Supervisor, TRACON, FIC, and the MET Office as appropriate.

c. Broadcast on tower frequency, the aerodrome is below published minima and that the aerodrome is closed to all aircraft operations.

d. TRACON, Clearance Delivery, and Ground Control shall broadcast the same information, advising pilots to expect indefinite delays due to the prevailing weather conditions; and

e Additionally, suggestions should be made as appropriate for pilots to return to their respective point of departure, continue to their alternate, or hold at designated/assigned holding points clear of the control zone.

7. ATCOs shall maintain awareness and update prevailing information as conditions change.

7-7. INFORMATION TO AIRCRAFT

After an arriving aircraft has placed itself under the control of Approach Control, the following information shall be passed as soon as practicable:

1. Runway in use.

2. Current meteorological information together with the time of observation:

   a. Surface wind direction (in degrees magnetic) and speed. The maximum wind speed should be included if it is 10 knots or more greater than the mean speed and the extremes in direction when the variation is 60 degrees or more and the mean speed exceeds 3 knots.

   b. Visibility.

   c. Present weather.

   d. Significant cloud amount and height of base.

   e. Relevant information reported by pilots of other aircraft, e.g., vertical wind shear, severe icing, severe turbulence.

   f. Significant meteorological information, e.g., thunderstorms, hail; and

   g. Warnings of marked temperature inversion.

3. Current runway surface conditions when appropriate.

4. Any changes in the operational status of visual and non-visual aids essential for approach and landing.

5. Low Visibility Procedures

Aircraft which have received the information above must be kept informed of the following until they have landed:

   a. Significant changes in the meteorological and runway conditions.

   b. Further reports from other pilots.

   c. Further changes in the operational status of approach and landing aids.

7-8. AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS)

1. The ATIS message is intended to provide a pilot with a range of information to enable him to make a definite decision about his approach and landing or take-off. The ATIS message is transmitted on a published VHF broadcast frequency or selected VORs therefore reducing RTF loading. The message should, whenever practicable, not exceed 30 seconds.

2. If a departure ATIS is installed, it may only be used by aircraft on the ground as the frequency has limited range protection. Combined arrival/departure ATIS facilities have a greater frequency protection and so may be used both on the ground and in the air.

3. Each message is to be consecutively coded using the phonetic alphabet. A new message is to be broadcast whenever there is a significant change in any of the items comprising the message and ATCOs must pass such changes to pilots on the RTF until the new ATIS message is being transmitted and has been acknowledged. All altimeter settings transmitted in the broadcast must be individually identified.

4. When rapidly changing weather conditions make it impracticable to include weather reports in the broadcast, the ATIS message is to indicate that the information will be passed on frequency.

5. In the case of a departure ATIS, ATCOs must obtain a read-back of all relevant altimeter settings contained in the broadcast, unless the setting will also be passed in association with start-up or taxi clearance.

6. Except where the broadcast includes a specific request to do so, pilots of departing aircraft need not acknowledge receipt of an ATIS message. Pilots of arriving aircraft are required to acknowledge receipt of the ATIS message on initial contact with Approach Control using the code letter allocated to the message. If a non-current code letter is used, or if receipt of ATIS is not acknowledged, Approach Control must pass the complete Information to Aircraft detailed in 11-6, above.

7. The ATIS message should contain all or part of the following elements of information in the order listed:

a. Name of aerodrome.

b. Arrival and/or departure indicator.

c. Designator.

d. Time of origin of weather report.

e. Type of approach to be expected.

f. Runway(s) in use; unless runway is that to which the instrument approach is made.

g. Significant runway surface conditions.

h. Holding/departure delay, if appropriate.

i. Surface wind direction (in degrees magnetic) and speed, including significant variations.

j. Visibility.

k. Present weather.

l. Cloud below 5000 ft., or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured; vertical visibility when available.

m. Altimeter settings.

n. Any available information on significant meteorological phenomena in the approach, take-off, and climb-out areas; and

o. Specific ATIS instructions.

7-9. VISUAL APPROACH

1. ATCOs shall not vector an aircraft for a visual approach to Nassau Airport unless the reported ceiling at the aerodrome is 500 feet or more above the Minimum Vectoring.

2. Altitude (MVA) and visibility is five (5) miles or more.

3. ATCOs shall not clear an aircraft for a visual approach unless the aircraft is, and can remain, in VFR conditions.

4. ATCOs shall issue visual approach clearances when the pilot reports sighting the aerodrome or a preceding aircraft which is to be followed.

5. ATCOs shall provide separation between aircraft except when visual approach is being applied by the pilot of the aircraft executing the visual approach.

6. ATCOs will continue flight following and provide traffic information until the aircraft is instructed to contact Nassau Tower.

7. ATCOs shall inform pilots conducting a visual approach of the aircraft class when pertinent traffic is known to be a HEAVY aircraft.

8. Within controlled airspace, standard separation shall be effected between such aircraft and other IFR and/or Special VFR aircraft.

9. Where IFR flights are authorized to make a visual approach, pilots are to be informed of any recommended wake turbulence separation minima.

7-10. INSTRUMENT APPROACHES

1. Official instrument approach procedures are published by the CAD. Pilots are normally expected to be conversant with these procedures, but in exceptional circumstances, a pilot may request the information. When this request is made, or it is apparent that the pilot is not conversant with these procedures, the following information is to be transmitted:

a. On initial contact:

i. "This is the approach procedure for (aid) for category A aircraft. Final approach track (degrees)".

ii. Arrival level (if necessary); and

iii. Type of reversal maneuver including outbound track, length in time or distance, level instructions, and direction of procedure turn where applicable.

b. When aircraft commences final reversal: intermediate and final approach track, intermediate and final approach fixes together with level instructions, stepdown fixes, and OCH.

c. Missed approach point and missed approach procedure (when required). Items a. (1) (b) and (c) may be omitted for straight-in approaches.

2. If the pilot is copying down the information, the whole procedure can be passed in one message.

3. Even if visual reference to the ground is established before completion of the approach procedure, the pilot will normally complete the whole procedure. At his request, however, he may be cleared to break off the instrument procedure and carry out a visual approach. Separation from other traffic is to be provided unless the pilot cancels his IFR plan.

4. ATCOs shall issue an IFR approach clearance only after the aircraft is established on a segment of published route or Instrument Approach Procedure (IAP), or assign an appropriate altitude for the aircraft to maintain until established.

7-11. HOLDING PROCEDURES

1. Holding shall be accomplished in accordance with notified procedures. If the notified entry and holding procedures are not known to the pilot, the appropriate ATC unit shall describe the procedures to be followed.

2. Levels at holding units shall be assigned so as to permit aircraft to approach in their correct order. Normally, the first aircraft to arrive over a holding unit should be at the lowest level with following aircraft at successively higher levels.

3. If a pilot advises that he is unable to comply with Approach Control holding or communication procedures, alternative procedures requested by him should be approved if traffic conditions permit.

4. Aircraft cleared into holding shall be given an "Expect Further Clearance Time" and be advised if more holding at a subsequent fix can be expected.

7-12. APPROACH SEQUENCE

1. The approach sequence shall be established in a manner which will facilitate arrival of the maximum number of aircraft with the least delay. When airborne holding is needed and the delay is expected to be less than that requiring the issue of EATs, ATCOs shall explicitly instruct pilots to hold (at the required exact reporting point) and provide the pilot with an estimate of the delay. When Expected Approach Times (EATs) are required, they shall be passed sufficiently in advance to permit pilots to arrange their flight paths accordingly.

2. The second aircraft in the approach sequence may be instructed to descend to the level previously occupied by the first aircraft, after the first aircraft has reported vacating it.

7-13. DIVERSIONS

1. Where marginal weather conditions exist or where the need for diversions is likely to arise due to the state of the aerodrome, traffic density, or for any other reason, ATCOs at aerodromes are to maintain the closest liaison with operating companies and the watch supervisor. They shall pass, as often as necessary, the latest pertinent information so that diversions may be anticipated and not interrupt the smooth flow of air traffic.

2. Aerodromes Receiving Diversions

a. When an ATCO is informed that aircraft are about to divert to his aerodrome, he shall ensure that full details are passed to the Aerodrome Operator.

b. After a diverted aircraft has landed, an arrival signal shall be sent to:

i. The aerodrome of departure; and

ii. The point of first intended landing.

7-14. DEPARTURES

1. ATC clearances issued by Approach Control shall specify any or all of the following:

a. Turn after take-off;

b. Track to make good before turning on to desired heading.

c. Initial level to fly; and

d. Time, point, and/or rate at which changes of level are made.

2. Pilots of all aircraft flying instrument departures are required, on first contact, to inform the approach/approach radar ATCO of their callsign, SID designator (if appropriate), current or passing level, and their cleared level. If the SID involves a stepped climb profile, then the initial altitude/flight level to which the aircraft is climbing will be given. If the pilot does not provide the cleared level, then ATCOs shall, without delay, either confirm that the crew are climbing to the correct initial level or clear the aircraft to climb to a higher altitude or flight level.

7-15. OVERFLIGHTS

When an aircraft requests permission to enter controlled airspace for the purposes of landing at the associated aerodrome or transiting the airspace, it may not be possible, for traffic reasons, to issue that clearance immediately. In such situations, ATCOs shall advise the pilot to remain outside controlled airspace, when to expect clearance, and give a time check.

CHAPTER 8. EMERGENCY PROCEDURES

8-1. AIRCRAFT EMERGENCIES

1. The circumstances of each aircraft emergency can vary to such an extent that detailed instructions cannot be given for every situation. The procedures outlined in this section are intended as a general guide and ATCOs must use their own judgment when handling a particular emergency.

a. ATCOs must always be alert to the possibility of an aircraft emergency. Speed may be necessary in certain circumstances but calm coordinated actions are essential in all situations.

b. ATCOs shall offer as much assistance as possible to any aircraft that is considered to be in an emergency situation. Assistance to the aircraft can include the provision of information on the availability of aerodromes and their associated approach aids, vectoring, weather information, and details of terrain clearance. An emergency may require alerting action to be taken immediately or it may develop to that point later.

c. The supervisor, if available, should be informed as soon as practicable, and where more than one ATSU is involved, complete coordination must be maintained between units.

2. An ATCO may suspect that an aircraft is in an emergency situation or has suffered unlawful interference when:

a. Radio contact is not established at the time it is expected to be established.

b. Radio contact is lost.

c. A pilot makes a report about the malfunctioning of his aircraft or the unusual behavior of persons on-board.

d. The erratic behavior of an aircraft or position symbol is observed.

e. It is overdue at an aerodrome; or

f. The pilot reports that the aircraft is short of fuel.

g. If the ATCO is in radio contact with the aircraft, he should ask the pilot if he wishes to declare an emergency and, if not specified by the pilot, the class of emergency being declared.

8-2 AIRCRAFT EMERGENCY GENERAL PROCEDURES

1. When an aircraft declares an emergency ATCO’s should take the following action if appropriate:

a. Ascertain the following information from the aircraft if possible:

i. Aircraft identification and type.

ii. Type of emergency.

iii. Intentions of the aircraft.

iv. Positions and altitude of the aircraft.

b. Decide the most appropriate type of assistance.

c. Notify other ATSU's that could help or other services if appropriate.

d. Provide the aircraft with any information requested and other aerodrome or weather information as applies.

e. Obtain the following information from the aircraft if possible or relevant:

i. Number of persons on board.

ii. Amount of fuel remaining.

iii. Cargo if any on board and whether it's hazardous or not.

f. The ATCO should notify the supervisor on duty as soon as possible.

2. Changes of frequency and/or beacon code changes should be avoided unless those changes improve the service to the aircraft.

3. Aircraft turns and altitude changes should be limited to those that improve the circumstances of the aircraft.

4. Aircraft in the vicinity should be notified if appropriate.

5. Aircraft in an emergency situation or being unlawfully being interfered should be given priority over other aircraft.

8-3. UNLAWFUL INTERFERENCE AND BOMB THREAT PROCEDURES

1. When unlawful interference with an aircraft is suspected, controllers should set the Mode A/SSR decoder to recognize code 7500 and code 7700.

2. When unlawful interference is known or suspected or a bomb threat has been received ATCO's should provide information as requested by the aircraft to help expedite its route of flight.

3. ATS Unit personnel should also:

a. Transmit and repeat transmissions of information that are pertinent to the aircrafts route of flight whether receiving a response from the aircraft or not.

b. Monitor the progress of the flight with all means available and coordinate flight circumstances and movement with adjacent ATS units or other FIR's as appropriate.

c. Notify as appropriate:

i. Aircraft representative.

ii. Appropriate rescue centre.

iii. Appropriate state authority.

d. Relay messages if required to the aircraft from the state authority.

4. Possible indicators of an aircraft experiencing unlawful interference:
   a. Unauthorized deviation from cleared flight profile.
   b. Refusal or inability to comply with ATC instructions (including vectoring) with no good reason.
   c. Loss of RTF contact particularly associated with flight profile deviation.
   d. Unauthorized SSR code changes or extended use of IDENT.
   e. Use of non-standard phraseology by the crew, or other covert attempt to highlight the situation (marked change in voice characteristics, etc.).
   f. Selection of A7600 (RTF failure) or A7700 (emergency), particularly associated with flight profile deviation.
   g. Notification from non-official sources (e.g., news agencies, etc.).
   h. Open RTF transmitter from the cockpit.
   i. Non-ATC related RTF transmission (e.g., political statement); and
   j. Non-specific threats passed via third party.

8-4. BOMB THREAT PROCEDURES

1. If a threat is received that a bomb or explosive device has placed on board an aircraft, the following action shall be taken:
   a. If in direct communication with the aircraft advise the flight crew without delay of the nature of the threat.
   b. If not in direct communication advise the aircraft by the fastest means possible either through other ATS Units or channels.

2. If in communications with the aircraft ascertain intentions of the flight crew.

3. Handle the aircraft in the most expeditious means possible without jeopardizing other aircraft or ground facilities to the extent possible.

4. Aircraft in flight should be cleared without delay to new destination if requested. Altitude changes to accommodate pressure changes should be granted as soon as possible.

5. An aircraft on the ground should be directed to remain as far away as possible from other aircraft or installations. The aircraft should be parked in an area designated by the state authority for this purpose or as designated by the supervisor. If the aircraft deplanes crew and passengers emergency crews and equipment should remain at a safe distance.

6. CAD ATCO's should not provide any advice to an aircrew regarding an explosive device.

8-5. EMERGENCY DESCENT PROCEDURES

1. An emergency descent is a maneuver initiated by flight crew in order to bring an aircraft in emergency to a safe level, in the minimum time, with the least possible passenger discomfort. The procedure is most frequently applied by aircraft that have suffered an uncontrollable loss of cabin pressurization, requiring a higher than normal rate of descent to approximately 10,000 ft amsl.

2. Due to high flight deck workload, the first indication to an ATCO that an aircraft is carrying out an emergency descent may be an unexpected change in level on the situation display. However, the pilot may be able to make a short RTF broadcast, and should select the emergency SSR code 7700.

3. Immediately upon recognizing that an emergency descent is in progress, ATCOs should acknowledge the emergency by RTF. If the pilot has not done so already, a simple prompt to squawk 7700 is acceptable, even during a time of intense flight deck workload.

4. ICAO Doc 7030 states that an aircraft shall, if able, initiate a turn away from the assigned route or track before commencing the emergency descent. Ultimately it is the pilot's responsibility to take the action most appropriate in the circumstances.

5. The ATCO’s priority is to provide separation from all conflicting traffic on the emergency descent aircraft’s track, issuing traffic information as appropriate and follow general emergency guidance in Paragraph 8-2 of this directive.

6. ATCOs should be aware that aircraft experiencing engine failure may also experience associated handling difficulties and should therefore limit maneuvering instructions to the minimum necessary.

8-6. OCEANIC AIRCRAFT EMERGENCY PROCEDURES

1. If an aircraft is unable to fly according to its clearance or if an aircraft is unable to maintain flight accuracy specified for the airspace an aircraft will try to obtain an alternate clearance if possible before commencing any other action.

2. An aircraft declaring an emergency can be expected to use the words MAYDAY three times if in a distress situation or PAN PAN three times if in an urgent situation. The ATCO’s actions shall be based on the intentions of the aircraft.

3. If clearance cannot be obtained from ATC (as specified in Paragraph 8-6, 1 above) the aircraft can be expected to:

a. Leave the assigned route by turning 90 degrees to the right or left relative to the route structure or turn to:
   i. An alternate aerodrome or for terrain clearance.
   ii. Any lateral offset route being flown; or
   iii. The altitudes allocated to other routes or tracks.
b. Following the turn the pilot can be expected to:
   i. If unable to maintain altitude, the aircraft will descend at a minimal rate, if possible.
   ii. Fly a track laterally separated by 15 miles from its assigned route.
   iii. Once established on the new route the flight can be expected to deviate by 500ft from altitudes normally used.

4. Pilots will try and establish communications with other nearby aircraft on 121.5 or 123.45 as appropriate to enlist their aid.

8-7. AIRCRAFT WEATHER DEVIATION PROCEDURES

1. ATCO's can expect pilots to request weather deviations with the phrase "Weather Deviation Required" or in extreme cases "Pan Pan" repeated three times. The pilot will inform the ATCO when weather deviation is no longer required.

2. When requested by the pilot for an alternate clearance to avoid weather, the ATCO shall take one of the following actions:
   a. Issue clearance to change route or track to avoid the weather or if there are other aircraft in conflict the ATCO shall:
      i. Advise the pilot alternate clearance cannot be given.
      ii. Advise the pilot of the conflicting traffic.
      iii. Request aircraft intentions.

3. If the pilot cannot obtain prior clearance to deviate for weather but needs to do so, the ATCO can expect the aircraft to do one of the following until the clearance can be obtained:
   a. Deviate away from the organized route or track system.
   b. Broadcast on 121.5 and/or 123.45 aircraft intentions.
   c. For deviations of less than 10 miles, aircraft will remain at its assigned altitude.
   d. For deviations of more than 10 miles the aircraft will initiate an altitude change consistent with the table below (Table 8-1). When returning to their assigned route the aircraft will return to its assigned altitude.

Route centre line track	*Deviations > 19 km (10 NM)*	*Level change*
EAST 000° – 179° magnetic	LEFT RIGHT	DESCEND 90 m (300 ft) CLIMB 90 m (300 ft)
WEST 180° – 359° magnetic	LEFT RIGHT	CLIMB 90 m (300 ft) DESCEND 90 m (300 ft)

Table 8-1

8-8. AIR-GROUND COMMUNICATIONS FAILURE

1. If two-way communications are lost with an aircraft and it has been established the cause of the failure is not the ground based frequency equipment, the ATCO shall take the following action to test the functional status of the aircraft communications equipment:

a. Instruct the aircraft to execute a turn and observe the resulting track.

b. Instruct the aircraft to IDENT.

c. Instruct the aircraft to make a beacon code change.

2. If the above is unsuccessful the ATCO should repeat the process on all other channels the aircraft could be monitoring.

3. The aircraft shall squawk Mode A Code 7600 if experiencing air-ground communications failure.

4. If it has been established that the aircraft is unable to receive or transmit signals successfully the ATCO shall maintain separation from other aircraft based on the following:

a. If in VMC, the aircraft will continue to fly in VMC conditions, land at the nearest suitable aerodrome, and cancel its flight plan in the most expeditious means possible.

b. If in instrument meteorological conditions or when conditions are such that it does not appear likely that the pilot will complete the flight in accordance with the VMC provisions above:

i. maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan; or

ii. In airspace where an ATS surveillance system is used in the provision of air traffic control, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minutes following: the time the last assigned level or minimum flight altitude is reached or, the time the transponder is set to Code 7600 or, the aircraft's failure to report its position over a compulsory reporting point; whichever is later and thereafter adjust level and speed in accordance with the filed flight plan.

iii. When being vectored or having been directed by ATC to proceed offset using RNAV without a specified limit, proceed in the most direct manner possible to rejoin the current

flight plan route no later than the next significant point, taking into consideration the applicable minimum flight altitude.

iv. Proceed according to the current flight plan route to the appropriate designated navigation aid or fix serving the destination aerodrome and, when required to ensure compliance with v below, hold over this aid or fix until commencement of descent.

v. Commence descent from the navigation aid or fix specified in iv above at, or as close as possible to, the expected approach time last received and acknowledged; or, if no expected approach time has been received and acknowledged, at, or as close as possible to, the estimated time of arrival resulting from the current flight plan.

vi. Complete a normal instrument approach procedure as specified for the designated navigation aid or fix; and land, if possible, within 30 minutes after the estimated time of arrival specified in v above or the last acknowledged expected approach time, whichever is later.

5. When it has been established that two-way communication has failed the ATCO shall broadcast in the blind pertinent information to the aircrafts route of flight including weather information at aerodromes. The ATCO shall also broadcast actions taken by the ATSU along with instructions that would apply in an emergency situation.

6. ATCO's shall broadcast information as necessary to other effected aircraft by the emergency radio failure.

7. The ATSU working the effected aircraft should forward information about the flight to other ATSU's along its route of flight.

8. If it is indicated that the aircraft might consider landing at one of the suitable aerodromes along its route of flight, the ATSU shall contact that aerodrome and relay the circumstances of the emergency.

9. When it is learned that communications have been re-established or the aircraft as landed the ATSU shall notify all concerned aircraft or other ATSU's.

10. If the aircraft has not reported within 30 minutes after its estimated arrival time (In filed flight plan) or the last acknowledged expected approach time whichever is later the ATSU shall

a. Forward pertinent information on the flight to operators, or their representatives or any effected aircraft and resume normal control procedures if they desire.

b. It is the responsibility of the operators, representatives, and aircraft to determine whether normal operations should resume or not.

8-9 ASSISTANCE TO VFR FLIGHTS

1. VFR flights reporting that they are lost or unsure of their position should be treated as aircraft in an emergency situation. The following information should be gathered as appropriate and care should be taken not find fault of the pilot's actions at this stage of the emergency:

a. Aircraft Flight Conditions.

b. Position (if known) and altitude.
c. Airspeed and heading form last known position.
d. Pilot experience.
e. Navigation equipment on-board and condition of the equipment.
f. SSR Mode and code selected, if relevant.
g. Departure and destination aerodromes.
h. Number of persons on-board.
i. Fuel remaining in minutes or hours.

2. If frequency communications are weak, ATCO's should suggest the aircraft climb to a higher altitude if able, provided the weather and other circumstances permit.

3. Navigation assistance can be provided through ATS surveillance, navigation aids, or possible sighting by another aircraft. The emergency aircraft should take care to remain clear of clouds through this process.

4. ATCO's should provide the pilot with reports and information on aerodromes in the area that are in VMC conditions.

5. If the aircraft is having difficulty maintaining VMC, the pilot should be informed of the minimum altitude in the area the aircraft is believed to be (if known, care should be exercised). If the aircraft is below that altitude and the position of the aircraft is known, ATCO's can suggest a heading or altitude (or both) that would take the aircraft to a safe level.

6. ATS surveillance systems should be used to assist the aircraft with the pilot's concurrence or by request. The main objective of using surveillance systems is to get the aircraft back into VMC conditions.

7. If IMC conditions can't be avoided, the following courses of action can be taken by the ATCO if appropriate:
a. Traffic on the radio frequency being used may be switched to another channel to facilitate communications with the emergency aircraft or if appropriate have the emergency aircraft change to another frequency.
b. If possible turns by the emergency aircraft should be carried out clear of clouds.
c. Abrupt aircraft maneuvers should be avoided.
d. Instructions to reduce speed or lower landing gear should be accomplished clear of clouds if possible.

8-10 STRAY OR UNIDENTIFIED AIRCRAFT PROCEDURES

1. For the purposes of this chapter, the terms strayed and unidentified aircraft have the following meaning:
a. Strayed aircraft: An aircraft which has deviated significantly from its intended track, or which reports that it is lost.
b. Unidentified aircraft: An aircraft which has been observed or reported to be operating in a given area but whose identify has not been established.

2. ATCOs are reminded that a strayed or unidentified aircraft may be the subject of unlawful interference and when this is suspected, shall follow the appropriate local procedures.

3. When a ATCO becomes aware of an aircraft which has deviated significantly from its intended track but has not reported as being lost, the following actions should be followed in so far as is necessary:

a. Attempt to establish two-way communication, unless such communication already exists, and inform the pilot of his position.

b. Inform other ATS units into whose area the aircraft has strayed or may stray.

c. Request appropriate assistance from other ATS units and other aircraft in establishing communication with the strayed aircraft.

4. In the event that a pilot reports that he is lost, ATCOs should provide every possible assistance to the pilot and use all available means to determine the aircraft's position. ATCOs should follow, as necessary, the actions outlined below:

a. Treat an estimated position given by the pilot with caution.

b. Use ATS surveillance systems and VDF in an attempt to locate the aircraft.

c. If communications are poor, or the ATCO suspects that the aircraft is below surveillance coverage, the pilot may be advised to climb. However, ATCOs should be aware that such a climb may present a pilot with flight conditions beyond their capabilities, and the pilot may prefer to remain with the surface in sight.

d. Consider terrain clearance if the aircraft is flying at a low level. ATCOs should make allowance for terrain and obstructions within a wide area around the estimated position of the aircraft and advise the pilot to climb if there is any doubt that adequate clearance exists. If a pilot is unable or unwilling to climb, he is to be warned of potential terrain hazards in the area.

e. Request assistance from other ATS units in determining the aircraft's position. VDF bearings from other units may assist in fixing the position. If it is not possible to establish the position of the aircraft immediately, bearings should be passed to the pilot; and

f. Notify the supervisor in the event that unlawful interference is suspected.

5. When the position of a lost aircraft has been established, the ATCO should:

a. Advise the aircraft of its position and any corrective action to be taken.

b. Coordinate as necessary with other ATS units when providing corrective action to the lost aircraft; and

c. As required, notify those units consulted in the tracing of the lost aircraft that the aircraft's position has been ascertained.

6. When an ATCO becomes aware of an unidentified aircraft within airspace for which they are the controlling authority and an ATC clearance is required, or when required by appropriate military authorities, he should follow, in so far as is necessary, the following actions:

a. Attempt to establish the identity of the aircraft.
b. Attempt to establish two-way communication.
c. Inform any other affected ATS units or neighboring FIRs and request their assistance in establishing the identity of and two-way communication with the aircraft.
d. If possible, attempt to obtain information from other aircraft in the area; and
e. As required, notify those units consulted in the tracing of the unidentified aircraft that the aircraft's identity has been ascertained.
f. When the aircraft's identity is established, inform the proper military authorities.
g. Inform the proper state authorities when it is believed the aircraft is being unlawfully interfered with.

8-11 Interception of Civil Aircraft

1. When it is learned an aircraft is being intercepted in its area of jurisdiction, the following actions can be taken if appropriate:

a. Attempt to establish two-way communications with the aircraft on all available channels.
b. Inform the pilot of the intercepted aircraft of the interception.
c. Establish contact with the intercepting agency and provide it with information on the aircraft.
d. Relay messages between the intercepted and intercepting aircraft or agencies if necessary.
e. Closely coordinate with the intercepting aircraft or agency to ensure the safety of the intercepted aircraft.
f. Inform other ATS units in adjacent FIR's as appropriate.

2. If it is learned that an aircraft is being intercepted in adjacent airspace (Another FIR or ATSU) and it is appropriate:

a. Furnish information that can help identify the aircraft.
b. Relay messages as necessary between the intercepted aircraft and the controlling ATS unit.

8-12 Fuel Dumping

1. Pilots of aircraft in flight are permitted to jettison fuel in an emergency. The decision to jettison rests solely with the pilot but he may request guidance from ATC.

2. When an aircraft in controlled airspace needs to dump fuel, ATC should co-ordinate with the flight crew:

a. The route to be flown which, if possible, should be clear of cities and towns, preferably over water and away from areas where thunderstorms have been reported or are expected.
b. The level to be used.
c. The estimated duration of the fuel dumping; and
d. The frequency to be monitored whilst the aircraft is dumping fuel.

3. ATCOs are to recommend to flight crew that jettisoning of fuel should be carried out above 10,000 feet āgl. Dumping will normally be carried out over water and above 4000 ft agl.

4. A vertical separation of at least 1000 feet between aircraft should be maintained.

5. Adjacent ATC units and control sectors should be informed of the fuel dumping taking place, including coordination with units providing services outside controlled airspace where the aircraft's track is near to the boundary of controlled airspace (both laterally and vertically).

6. ATCO's should broadcast a message on all available channels (Including 121.5) of the fuel dumping operation area and circumstances.

8-13 AIRBORNE COLLISION AVOIDANCE SYSTEM PROCEDURES

1. General Terms and Definitions
   a. Airborne Collision Avoidance System (ACAS) is an aircraft system based on SSR transponder signals, which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.
   b. Traffic Alert and Collision Avoidance System (TCAS) II acts only as a safety net, and does not in any way alter the respective responsibilities of pilots and ATCOs for the safe operation of aircraft.

2. TCAS II encounters may take place within all classifications of airspace. TCAS II equipment reacts to the transponders of other aircraft to determine whether or not there is a potential risk of collision. The warning, based on the time to an assumed collision, enables the pilot to identify the conflicting traffic and, if necessary, take avoiding action. Warnings for aircraft equipped with TCAS II are given in two steps:
   a. Typically 45 seconds before the assumed collision: (Traffic Advisory (TA) warning)
      i. Pilots are advised not to take avoiding action on the basis of TA information alone but may ask for traffic information.
      ii. Pilot looks for conflicting aircraft visually.
      iii. Does NOT maneuver.
   b. Typically 30 seconds before the assumed collision: (Resolution Advisory (RA) warning.)
      i. Pilot receives advice to climb, descend, or maintain their existing flight profile. Rate of climb or descent may also be given.
      ii. Pilots are expected to respond immediately but have been instructed to restrict maneuvers to the minimum necessary to resolve the confliction, advise the ATC unit as soon as is practical thereafter, and return to their original flight path as soon as it is safe to do so.

3. The commander of an aircraft is permitted to depart from an ATC clearance for the purposes of avoiding immediate danger. Response to an RA comes under this heading and is not, therefore, a breach of Rules of the Air 2007.

4. When a pilot reports a TCAS RA, ATCOs shall not attempt to modify the aircraft's flight path or reiterate previously issued instructions, until the pilot reports "Clear of Conflict". Once an aircraft departs from an ATC clearance in compliance with an RA, or a pilot reports an RA, the ATCO ceases to be responsible for providing separation between that aircraft and any other aircraft affected as a direct consequence of the maneuver induced by the RA. The ATCO shall resume responsibility for providing separation for all the aircraft affected when:

a. The ATCO acknowledges a report from the flight crew that the aircraft has resumed the current clearance; and

b. The ATCO acknowledges a report from the flight crew that the aircraft is resuming the current clearance and issues an alternative clearance which is acknowledged by the flight crew.

5. The passing of traffic information by ATCOs to aircraft conducting, or affected by a TCAS RA, is not proscribed, but such information has, if provided inappropriately, the potential to be misheard or to distract flight crews during a period of very high workload. Consequently, ATCOs should not routinely pass traffic information to aircraft conducting RA maneuvers, or other aircraft affected by such maneuvers. Nevertheless, there may be circumstances where the passing of traffic information is justified; consequently, ATCOs may provide traffic information under the following circumstances:

a. To aircraft conducting an RA maneuver if it is considered essential for flight safety (e.g., information on aircraft which are known to be in close proximity that are not transponding Mode C information).

b. To other aircraft affected by an RA maneuver if judged necessary by the ATCO (e.g., in airspace where the carriage and operation of TCAS and/or SSR transponders is not mandatory).

8-14 SIMILAR SOUNDING CALL SIGNS

1. ATCO’s can instruct aircraft to change their call sign in the interest of air safety, when similarity with another aircraft can cause confusion.

2. Any change of the call sign shall be temporary and only applicable in the airspace where the confusion could occur. The aircraft should be advised when it can return to its original call sign.

3. When changing the call sign of an aircraft it should be identified on frequency by its position and altitude.

8-15 DANGEROUS CARGO

1. When the pilot of an aircraft in an emergency provides information about dangerous goods being carried as cargo, this information must be relayed without delay to the ATSU at the aerodrome of intended landing.

2. ICAO requires the pilot to give information about the dangerous goods to the ATSU either in full detail, as a summary, or by providing a telephone number of the location from where this detailed information can be obtained immediately. Therefore, when a pilot intends to provide an ATSU with dangerous goods information, ATCOs should, as the preferred option, request the pilot to provide a telephone number from where detailed information can be obtained.

3. However, it is possible that the pilot might not be able to provide this telephone number, and therefore, ATCOs should then request the pilot to provide a summary of the quantities and classes or divisions of dangerous goods carried, as receipt and transcription of full details of voluminous and technically detailed chemical information would be impracticable.

4. It is important that all details provided by the pilot are passed, without delay, to the relevant emergency services.

5. In the event that an aircraft that is known to be carrying dangerous goods has crashed, all pertinent information, including that relating to the dangerous goods carried on the aircraft, shall be passed to the Senior Fire Officer (or the Fire Service Incident Commander or Senior Police Officer) at the Accident site without delay.

8-16 OVERDUE AIRCRAFT PROCEDURES

1. Overdue action should not be considered in isolation and the emergency actions described in other chapters; in particular, radio failure procedures should be applied if they are appropriate. For example, if a radio equipped aircraft fails to make an expected report, continued attempts should be made to re-establish communication while at the same time commencing overdue action.

2. Overdue action is not related solely to the filing of a flight plan. If, at any stage of a flight, the pilot has made his intentions clear and subsequently does not arrive or report when expected, ATCOs should seriously consider taking overdue action.

3. Overdue action described in this chapter must be commenced not later than the times shown in the following paragraphs. The decision to take overdue action before these times is left to the discretion of the ATCO. The following points may assist in making the decision:

a. Type of Aircraft - Strict adherence to the flight plan cannot always be expected of a non-radio light aircraft.

b. Route - The need for prompt action if the route is over sparsely populated areas, mountainous country, and long stretches of water, etc.

c. Weather - The pilot of a non-radio aircraft might well be expected to extend his flight time by deviating from his planned route to avoid bad weather. Where no additional hazards exist, sufficient time for a deviation should be allowed.

4. The following preliminary action for a non-radio equipped aircraft shall be commenced not later than 30 minutes after ETA:

a. Check flight plan for obvious errors in compilation or transmission.

b. Consult operating company or representative, if available.

c. Confirm Actual Time of Departure (ATD) with aerodrome of departure using the quickest means of communication.

d. Inform the watch supervisor of the situation and in coordination with him:

i. Check with alternate aerodromes; and

ii. Send RQS message.

iii. Check with any likely aerodromes on, and adjacent to, the proposed route of the aircraft.

5. The following overdue action for a non-radio equipped aircraft shall be commenced not later than 1 hour after ETA:

a. Notify the parent watch supervisor that the aircraft is now fully overdue and state the action(s) already taken; and

b. In consultation with the watch supervisor, continue endeavors to trace the aircraft, e.g., notify local police or any other appropriate bodies to be on the lookout for the aircraft if it is assumed that it has made a forced landing in a particular area.

6. If an aircraft fails to make a position report when expected, the following preliminary action shall be commenced not later than the estimated time for the reporting point plus 30 minutes:

a. Advise the watch supervisor that the aircraft is overdue.

b. Confirm ATD from departure aerodrome by quickest possible means; and

c. Ensure that an RQS message is sent.

7. If, after the action above, no news is received or 1 hour has elapsed since a scheduled position report should have been received, or the fuel carried by the aircraft is considered to be exhausted, whichever is first, the ATCO at the destination aerodrome shall inform the watch supervisor that the aircraft is fully overdue.

8. If an aircraft, which has been cleared to commence approach, after completing any necessary holding, fails to land within 5 minutes of the estimated time of landing and communication cannot be established, the following action shall be taken:

a. Alert Approach Radar Control where available.

b. Request other aircraft flying in the vicinity of the aircraft’s last known position to be on the lookout.

c. Exercise caution when authorizing the movement of aerodrome traffic.

d. Alert the local emergency services.

e. Check with other aerodromes in vicinity; and

f. If necessary, send RQS message.

8-17 ALERTING SERVICE PROCEDURES

1. The Nassau Flight Information Centre Coordinator (NFICC) shall, (except in the circumstances in paragraph b below), notify appropriate rescue coordination centres (RCC) immediately if an aircraft is considered to be in a state of emergency in accordance with the following:

a. When the Nassau Flight Information Centre has decided that an aircraft is in the uncertainty or the alert phase, it shall, when practicable, advise the operator prior to notifying the rescue coordination centre.

2. Uncertainty phase (INCERFA).

a. No communication has been received from an aircraft within a period of thirty minutes after the time a communication should have been received, or from the time an unsuccessful attempt to establish communication with such aircraft was first made, whichever is the earlier; or

b. When and aircraft fails to arrive within thirty minutes of the estimated time of arrival last notified to or estimated by air traffic services units, whichever is the later, except when no doubt exists as to the safety of the aircraft and its occupants.

3. Responsibility of Nassau Flight Information Centre ATCOs positions "N", "M", "X" and "AFTN" in the Uncertainty phase (INCERFA).

a. Advise the Nassau Flight Information Centre Coordinator (NFICC) or his/her designated representative immediately when an aircraft is considered to be in a state of emergency.

b. Call the aircraft on all ATC and NFICC frequencies.

c. Contact the departure point and ascertain whether the aircraft definitely departed (confirm ATD) and verify destination, ETA and routing; and

d. Request any aircraft in flight on the same route to check airstrips via unicorn frequency (122.8MHz) if available, or visually if it is practicable.

Note 1: If (c) and (d) above fails to produce positive information, as soon as possible thereafter initiate the alert phase.

Note 2: The NFICC should at this time have activated the Aircraft Overdue Form.

4. Responsibility of Nassau Flight Information Centre ATCOs positions "N", "M", "X" and "AFTN" in the Alert phase (ALERFA).

a. Following the uncertainty phase, subsequent attempts to establish communication with the aircraft or inquiries to other relevant sources have failed to reveal any news of the aircraft.

b. An aircraft has been cleared to land and fails to land within five minutes of the estimated time of landing and communication has not been re-established with the aircraft.

c. Information has been received which indicates that the operating efficiency of the aircraft has been impaired, but not to the extent that a forced landing is likely, except when evidence exists that would allay apprehension as to the safety of the aircraft and its occupants; or

d. An aircraft is known or believed to be the subject of unlawful interference.

e. Responsibility of Nassau Information Centre Coordinator (NFICC) or his/her designated representative.

5. Alert phase (ALERFA).

a. The Nassau Flight Information Centre Coordinator (NFICC) or his/her designated representative shall inform the Watch Supervisor (WS).

b. The NFICC shall relay information to the United States Coast Guard (USCG), via direct line to Miami International Flight Service Station (AIFSS).

c. Inform Bahamas Air Sea Rescue Auxiliary (BASRA) via telephone.

d. Contact all airstrips via overseas telephone, on the route and within the immediate area of the destination where the aircraft could have landed; and

e. Originate an alert message giving description of the aircraft, its route, and last known position and transmit via AFTN to the USCG Miami and to all stations on the AFTN Circuit within an area it is likely that the aircraft could have landed, or communications could have been made with the aircraft, or the distance the fuel endurance would permit the aircraft to travel.

6. Declaration of Distress phase (DETRESFA); Following the alert phase, further unsuccessful attempts to establish communication with the aircraft and more wide spread unsuccessful inquiries point to the probability that the aircraft is in distress.

a. The fuel on board is considered to be exhausted, or to be insufficient to enable the aircraft to reach safety.

b. Information is received which indicates that the operating efficiency of the aircraft has been impaired to the extent that a forced landing is likely; or

c. Information is received or it is reasonably certain that the aircraft is about to make or has made a forced landing,

7. Distress phase actions by NFICC (DETRESFA).

a. The NFICC shall inform the WS of the action taken.

b. The WS shall inform the duty Operations Officer.

c. The duty Operations Officer shall inform the appropriate Chief Operations Officer, Senior Deputy Director, Deputy Director, and Director.

d. The NFICC shall relay information to the United States Coast Guard (USCG), via direct line to Miami International Flight Service Station (AIFSS).

e. Inform BASRA via telephone.

f. Inform the Port Director.

g. Originate a Distress message DETRESFA giving all information filed on the flight plan and last known position and transmit via AFTN to USCG Miami and to all stations on the AFTN Circuit within an area the fuel endurance would permit the aircraft to travel.

h. The notification shall contain such of the following information as is available in the order listed:

i. INCERFA, ALERFA, or DETRESFA, as appropriate to the phase of the emergency.
ii. Agency and person calling.
iii. Nature of the emergency.
iv. Significant information from the flight plan.
v. Unit which made last contact, time, and frequency used.
vi. Last position report and how determined.
vii. Color and distinctive marks of aircraft.
viii. Any action taken by reporting officer; and
ix. Other pertinent remarks.

8. It is recommended that such part of the information specified above, which is not available at the time notification is made to the Miami AIFSS/USCG rescue co-ordination centre, should be sought by the NFICC prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.

9. Further to the notification above, the Miami AIFSS/ USCG shall, without delay, be furnished with:

a. Any useful additional information, especially on the development of the state of emergency through subsequent phases.
b. Information That The Emergency Situation No Longer Exists.

Note 1: The cancellation of action initiated by the NFICC is the responsibility of that centre; originate an information request to the following:
a. Telephone all Commissioners or Local Authorities at Family Islands;
b. ZNS, Studio to broadcast for information;
c. Telephone the Marine Operator, through the Overseas Operator.
Note 2: The aircraft overdue form shall be kept current of all action and times, at all times.

8-18. EMERGENCY POSITION INDICATING RADIO BEACONS

Emergency Position Indicating Radio Beacons are carried by some marine craft to indicate position when in distress by the transmission of a distinctive signal. When operating on 121.5 MHz, they have a range of approximately 30 miles and the signal characteristics are a downward sweep over a range of not less than 700 Hz within the limits of 1600 – 300 Hz repeated 2 or 3 times per second. Although it is unlikely that ATSUs will hear this signal, reports of reception may be received from aircraft.

CHAPTER 9 ADMINISTRATIVE INFORMATION

9-1. DISTRIBUTION

This order is distributed to all ATS Bahamas personnel.

9-2. BACKGROUND

The ATS Bahamas training programme is based on national, local, and international directives.

9-3. RELATED PUBLICATIONS OR REFERENCES

Documents applicable to this programme are listed below:

ICAO Document 4444, Air Traffic Management
FAA Order 7110.65U, Chapter 5

APPENDIX A. AIRCRAFT INFORMATION

Aircraft Information - Fixed-Wing Aircraft

TYPE ENGINE ABBREVIATIONS

P	piston
T	turboprop
J	jet

CLIMB AND DESCENT RATES

Climb and descent rates based on average en route climb/descent profiles at median weight between maximum gross takeoff and landing weights.

MANUFACTURERS

Listed under the primary manufacturer are other aircraft manufacturers who make versions of some of the aircraft in that group.

AIRCRAFT WEIGHT CLASSES

a. Heavy. Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.

b. Large. Aircraft of more than 41,000 pounds, maximum certificated takeoff weight, up to but not including 300,000 pounds.

c. Small. Aircraft of 41,000 pounds or less maximum certificated takeoff weight.

NOTE−

** Denotes single-piloted military turbojet aircraft or aircraft to receive the same procedural handling as a single-piloted military turbojet aircraft.*

**** Denotes amphibian aircraft.*

+ Denotes aircraft weighing between 12,500 lbs. and 41,000 lbs. For Class B Airspace rules, these aircraft are "large, turbine−engine-powered aircraft."

TBL A−1
Land and Hold Short Operations (LAHSO)
Aircraft Group/Distance Minima

	Sea Level −999	**1,000− 1,999**	**2000− 2,999**	**3000− 3,999**	**4000− 4,999**	**5000− 5,999**	**6000− 6,999**	**7000− 7,000**
Group 1	2500	2550	2600	2650	2700	2750	2800	2850
Group 2 & Below	3000	3050	3100	3150	3200	3250	3300	3500
Group 3 & Below	3500	3550	3600	3650	3700	3750	3800	3850
Group 4 & Below	4000	4050	4100	4150	4200	4250	4300	4350
Group 5 & Below	4500	4550	4600	4650	4700	4750	4800	4850
Group 6 & Below	5000	5100	5200	5300	5400	5500	5600	5700
Group 7 & Below	6000	6100	6200	6300	6400	6500	6600	6700
Group 8 & Below	7000	7100	7200	7300	7400	7500	7600	7700
Group 9 & Below	8000	8100	8200	8300	8400	8500	8600	8700
Group 10	Greater than 8000 feet							

TBL A−1 is an air traffic control tool for identifying aircraft, by groups, that are able to land and hold short based on the available landing distance. Air traffic managers must utilize TBL A−1 for identifying aircraft by groups that are able to land and hold short at their unit in accordance with FAA Order 7110.118, Land and Hold Short Operations.

ADAM AIRCRAFT (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−500, CarbonAero	A500	2P/S			II	

AERMACCHI SpA (Italy)

(Also AGUSTA, SIAI−MARCHETTI)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
AMX	AMX*	1J/S+			III	
FN−333 Riviera***	FN33	1P/S			I	
MB−290TP Redigo	L90	1T/S			I	
MB−326	M32	1J/S			III	
MB−339	M339*	1J/S			III	
SF−205−18F/20F	S05F	1P/S			I	
SF−205−18R/20R/22R	S05R	1P/S			I	
S−208	S208	1P/S			I	
S−211	S211	1T/S			I	
SF−260 A/B/C/D/E/F/M/W,	F260	1P/S			I	
SF−260TP	F26T	1T/S	1,800	1,100	I	3
SF−600A, SF−600TP Canguero	F600	2T/S	2,100		II	4

AERONCA *(USA− see Bellanca)*

AERO SPACELINES (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Super Guppy, Super Turbine Guppy	SGUP	4T/L	1,500	1,500	III	10

AEROSPATIALE (France)

(Also AEROSPATIALE/AERITALIA, ATR, ALENIA MORANE−SAULNIER, PZL−OKECIE, SOCATA, SUD, SUD−EST, TBM)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
ATR−42−200/300/320	AT43	2T/L	2,000	2,000	III	5
ATR−42−400	AT44	2T/L	2,000	2,000	III	5
ATR−42−500	AT45	2T/L	2,000	2,000	III	5
ATR−72	AT72	2T/L	2,000	2,000	III	6

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Rallye, Rallye Club, Super Rallye, Rallye Commodore, Minerva (MS−880 to 894)	RALL	1P/S	750	750	I	3
SE−210 Caravelle	S210	2J/L	2,300	2,000	III	8
SN−601 Corvette	S601	2J/S+	2,500	2,000	III	5
Tampico TB−9	TAMP	1P/S	600	700	I	2
TBM TB−700	TBM7	1T/S	1,700	1,500	I	5
Tabago TB10C/200	TOBA	1P/S	700	700	I	2
Trinidad TB−20/21	TRIN	1P/S	850	700	I	3

AIRBUS INDUSTRIES (International)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−300B2/4−1/2/100/ 200, A−300C4−200	A30B	2J/H	3,500	3,500	III	8
A−300B4 − 600	A306	2J/H	3,500	3,500	III	7
A−310 (CC−150 Polaris)	A310	2J/H	3,500	3,500	III	7
A−318	A318	2J/L	3,500	3,500	III	
A−319, ACJ	A319	2J/L	3,500	3,500	III	7
A−320	A320	2J/L	3,500	3,500	III	7
A−321	A321	2J/L	3,500	3,500	III	
A−300ST Super Transporter,	A3ST	2J/H			III	
A−330−200	A332	2J/H	3,500	3,500	III	8
A−330−300	A333	2J/H			III	8
A−340−200	A342	4J/H	3,500	3,500	III	9
A−340−300	A343	4J/H			III	9
A−340−500	A345	4J/H			III	9
A−340−600	A346	4J/H			III	9
A−380−800	A388	4J/H			III	10

AIRCRAFT HYDRO−FORMING (USA)

(Also BUSHMASTER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Bushmaster 2000	BU20	3P/S+	2,000	2,000	III	2

AIR TRACTOR, INC. (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
AT−300/301/401	AT3P	1P/S	1,000		I	1
AT−302/400/402	AT3T	1T/S			I	
AT−501	AT5P	1P/S			I	
AT−502/503	AT5T	1T/S			I	
AT−602	AT6T	1T/S			I	
AT−802	AT8T	1T/S+			III	

ANTONOV (Russia)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
An−2	AN2	1P/S			I	
An−8	AN8	2T/L			III	
An−12	AN12	4T/L			III	
An−22	AN22	4T/H			III	
An−70	AN70	4T/H			III	
An−74−100/200	AN72	2J/L			III	
An−124 Ruslan	A124	4J/H			III	
An−140	A140	2T/L			III	
An−225 Mriya	A225	6J/H			III	

AVIATION DEVELOPMENT (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Alaskan Bushmaster	ALBU	1P/S			I	

BEAGLE AIRCRAFT (UK)

(Also BEAGLE−AUSTER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−109 Airedale	AIRD	1P/S			I	
B−121 Pup	PUP	1P/S	575	750	I	2
B−125 Bulldog	BDOG	1P/S			I	
B−206 Basset	BASS	2P/S	1,200	1,300	II	8

BEECH AIRCRAFT COMPANY (USA)

(Also CCF, COLEMILL, DINFIA, EXCALIBUR, FUJI, HAMILTON, JETCRAFTERS, RAYTHEON, SWEARINGEN, VOLPAR)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
1900 (C−12J)	B190	2T/S+	2,400	2,400	III	7
B300 Super King Air 350	B350	2T/S+	3,000	3,000	III	7
100 King Air (U−21F Ute)	BE10	2T/S	2,250	2,250	II	7
17 Stagger Wing (UC−43 Traveler, YC−43 Traveler)	BE17	1P/S	1,375	1,375	I	2
Twin Beech 18/Super H18	BE18	2P/S	1,400	1,000	II	4
18 (turbine)	B18T	2T/S	2,000	2,000	II	
19 Musketeer Sport, Sport	BE19	1P/S	680	680	I	1
200, 1300 Super King Air, Commuter (C−12A to F, C−12L/R, UC−12, RC−12, Tp101, Huron)	BE20	2T/S+	2,450	2,500	III	7
23 Musketeer, Sundowner	BE23	1P/S	740	800	I	2
24 Musketeer Super, Sierra	BE24	1P/S	1,000	1,000	I	3
300 Super King Air	BE30	2T/S+	3,000	3,000	III	6
33 Debonair, Bonanza (E−24)	BE33	1P/S	1,000	1,000	I	4
35 Bonanza	BE35	1P/S	1,200	1,200	I	3
36 Bonanza (piston)	BE36	1P/S	1,100	1,100	I	2
36 Bonanza (turbine)	B36T	1/T/S			I	
400 Beechjet, Hawker 400 (T−1 Jayhawk, T−400)	BE40	2J/S+	3,300	2,200	III	8
50 Twin Bonanza (U−8D/E/G, RU−8 Seminole)	BE50	2P/S	1,600	1,600	II	4
55 Baron (T−42 Chochise, C−55,	BE55	2P/S	1,700	1,700	II	6
56 Turbo Baron	BE56	2P/S			II	
58 Baron	BE58	2P/S	1,730	1,730	II	6
60 Duke	BE60	2P/S	1,600	1,600	II	8
65 Queen Air (U−8F Seminole)	BE65	2P/S	1,300	1,300	II	5
70 Queen Air	BE70	2P/S			II	
76 Duchess	BE76	2P/S	1,500	1,500	II	4
77 Skipper	BE77	1P/S	750	750	I	1
80 Queen Air (Zamir)	BE80	2P/S	1,275	1,275	II	
88 Queen Air	BE88	2P/S			II	
95 Travel Air	BE95	2P/S	1,250	1,250	II	5
99 Airliner	BE99	2T/S	1,750	1,750	II	5
90, A90 to E90 King Air (T−44	BE9L	2T/S	2,000	2,000	II	5
F90 King Air	BE9T	2T/S	2,600	2,600	II	7
2000 Starship	STAR	2T/S+	2,650	2,650	III	7
Premier 1, 390	PRM1	2J/S+	3,000	3,000	III	
T34A/B, E−17 Mentor (45)	T34P	1P/S	1,150	1,150	I	1
T−34C Turbo Mentor	T34T	1T/S	1,100	1,000	I	
T−6A Texan II	TEX2*	1T/S			I	
U−21A/G, EU−21, JU−21, RU−21, Ute (A90−1 to 4)	U21	2T/S	2,000	2,000	II	
QU−22 (1074/1079)	U22	1P/S			I	

BELLANCA AIRCRAFT (USA)

(Also AERONCA, CHAMPION, DOWNER, HINDUSTAN, NORTHERN)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Aeronca Chief/Super Chief,	AR11	1P/S	500	500	I	1
Aeronca Sedan	AR15	1P/S	500	500	I	2
14 Junior, Cruiseair, Cruiseair Senior Cruisemaster	B14A	1P/S	1,030	1,030	I	1
14 Bellanca 260/A/B/C	B14C	1P/S	1,500		I	
17 Viking, Super Viking, Turbo	BL17	1P/S	1,100	1,100	I	1
19 Skyrocket	BL19	1P/S			I	
8 Decathlon, Scout	BL8	1P/S	1,000	1,000	I	2
Champion Lancer 402	CH40	2P/S	650	1,000	II	
7 ACA/ECA Champ, Citabria,	CH7A	1P/S	750	750	I	1
7 GCBC/KCAB Citabria	CH7B	1P/S	1,100	1,100	I	1
T−250 Aries	T250	1P/S			I	

BOEING COMPANY (USA)

(Also GRUMMAN, IAI, LOCKHEED−BOEING, MCDONNELL DOUGLAS, NORTHROP−GRUMMAN, ROHR)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
B−52 Stratofortress	B52	8J/H	3,000	3,000	III	
707−100 (C−137B)	B701	4J/H	3,500	3,500	III	9
707−300(C−18, C−137C, E−8J−Stars, EC−18, EC−137,	B703	4J/H	3,500	3,500	III	9
717−200	B712	2J/L			III	7
720	B720	4J/L	3,000	3,000	III	9
727−100 (C−22)	B721	3J/L	4,500	4,500	III	7
727−200	B722	3J/L	4,500	4,500	III	7
727−100RE Super 27	R721	3J/L	4,300	4,300	III	
727−200RE Super 27	R722	3J/L	4,300	4,300	III	
737−100	B731	2J/L	3,000	3,000	III	7
737−200 (Surveiller, CT−43,	B732	2J/L	3,000	3,000	III	7
737−300	B733	2J/L	5,500	3,500	III	7
737−400	B734	2J/L	6,500	3,500	III	8
737−500	B735	2J/L	5,500	3,500	III	7
737−600	B736	2J/L	4,000	4,000	III	7
737−700, BBJ, C−40	B737	2J/L	4,000	4,000	III	8
737−800, BBJ2	B738	2J/L	4,000	4,000	III	7
737−900	B739	2J/L	4,000	4,000	III	8
747−100	B741	4J/H	3,000	3,000	III	10
747−200 (E−4, VC−25)	B742	4J/H	3,000	3,000	III	10
747−300	B743	4J/H	3,000	3,000	III	10
747−400 (Domestic, no winglets)	B74D	4J/H	3,000	3,000	III	

747−400 (International, winglets)	B744	4J/H	3,000	3,000	III	10

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
747−400LCF Dreamlifter	BLCF	4J/H			III	
747SCA Shuttle Carrier	BSCA	4J/H			III	
747SR	B74R	4J/H	3,000	3,000	III	10
747SP	B74S	4J/H	3,000	3,000	III	9
757−200 (C−32)	B752	2J/L	3,500	2,500	III	7
757−300	B753	2J/L	3,500	2,500	III	8
767−200	B762	2J/H	3,500	3,500	III	9
767−300	B763	2J/H	3,500	3,500	III	9
767−400	B764	2J/H	3,500	3,500	III	9
777−200, 777−200ER	B772	2J/H	2,500	2,500	III	9
777−200LR, B777−200LRF	B77L	2J.H			III	
777−300	B773	2J/H	2,500	2,500	III	9
777−300ER	B77W	2J/H			III	
787−3 Dreamliner, Dreamliner	B783	2J/H			III	
787−8 Dreamliner, Dreamliner	B788	2J/H			III	
787−9 Dreamliner, Dreamliner	B789	2J/H			III	
C−135B/C/E/K Stratolifter (EC−135, NKC−135, OC−135,	C135	4J/H	2,000	2,000	III	
C−17 Globemaster 3	C17	4J/H			III	
C−97 Stratofreighter	C97	4P/L	2,500	3,000	III	
KC−135A Stratotanker (J57	K35A	4J/H	2,500	3,000	III	
KC 135D/E Stratotanker (TF33 engines)	K35E	4J/H	5,000	3,000	III	
KC 135R/T, C−135FR, Stratotanker (CFM56 engines)	K35R	4J/H	5,000	3,000	III	
KE−3	KE3	4J/H	3,500	3,500	III	
RC−135	R135	4J/H	3,000	3,000	III	
E−3A (TF33), E−B/C, JE−3,	E3TF	4J/H	3,500	4,000	III	
E−3A (CFM56), E−3D/F, Sentry	E3CF	4J/H			III	
E6 Mercury	E6	4J/H	3,500	3,500	III	
E−767	E767	2J/H	2,500	2,500	III	
75 Kaydet (PT−13, PT−17, PT−18, PT−27, N2S)	ST75	1P/S	840	840	I	

BOMBARDIER (Canada)

(Also CANADAIR)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
BD−100 Challenger 300	CL30	2J/S+	3,500	3,500	III	7
BD−700 Global 5000	GL5T	2J/L	3,500	3,500	III	7
BD−700 Global Express, Sentinel	GLEX	2J/L			III	7

BRITISH AEROSPACE (BAe) (UK)

(Also AIL, AVRO, BAC, BUCURESTI, DE HAVILLAND, HANDLEY−PAGE, HAWKER−SIDDELEY, JETSTREAM, KANPUR, MCDONNELL−DOUGLAS, RAYTHEON, SCOTTISH−AVIATION, VOLPAR)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
BAe 748 (Andover, C−91)	A748	2T/L	2,500	2,000	III	5
ATP Advance Turboprop (ATP)	ATP	2T/L	3,000	3,000	III	6
BAC−111 One−Eleven	BA11	2J/L	2,400	2,400	III	7
BAC−167 Strikemaster	JPRO	1J/S			III	
BAe HS 125 Series 1/2/3/400/600	H25A	2J/S+	2,500	2,000	III	6
BAe−125−700/800 (C−29,	H25B	2J/S+	3,000	4,000	III	7
BAe−125−1000	H25C	2J/S+	3,000	4,000	III	7
BAe−146−100 Statesman	B461	4J/L	3,500	3,500	III	7
BAe−146−200 Quiet Trader,	B462	4J/L	3,500	3,500	III	7
BAe−146−300	B463	4J/L			III	7
BAe−3100 Jetstream 31 (T.Mk.3)	JS31	2T/S+	2200	2200	III	5
BAe−3200 Jetstream Super 31	JS32	2T/S+	2600	2600	III	5
BAe−4100 Jetstream 41	JS41	2T/S+	2200		III	7
Harrier, Sea Harrier	HAR*	1J/L	5,000	8,000	III	
Hawk, T−45 Goshawk, CT−155	HAWK	1J/S+			III	
Jetstream 1	JS1	2T/S+	2,200	2,200	III	
Jetstream 3	JS3	2T/S+	2,200	2,300	III	
Jetstream 200	JS20	2T/S+	2,200	2,200	III	
Nimrod	N1M	4J/L			III	
RJ−70	RJ70	4J/L			III	7
RJ−85	RJ85	4J/L			III	7
RJ−100	RJ1H	4J/L			III	7
Tornado	TOR	2J/L			III	

BRITTEN NORMAN LTD. (A subsidiary of Pilatus Aircraft LTD.) (UK)

(Also AVIONS FAIREY, BAC, BUCURESTI, DE HAVILLAND, HAWKER−SIDDELEY, IRMA, PADC, ROMAERO, VICKERS)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
BN−2, BN−2A/B Islander, Defender, Maritime Defender	BN2P	2P/S	1,250	1,250	II	1
BN−2T Turbine Islander, Turbine	BN2T	2T/S	1,500	1,500	II	1
Trident	TRID	3J/L	3,000	3,000	III	
BN−2A Mk3 Trislander	TRIS	3P/S	1,200	1,000	III	2
VC−10	VC10	4J/H	1,900	2,000	III	
Viscount	VISC	4T/L	1,200	1,500	III	10

BUSHMASTER AIRCRAFT CORP. (USA—*see Aircraft Hydro Forming*)

CAMAIR AIRCRAFT CORP. (USA)

(Also RILEY, TEMCO)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
480 Twin Navion	TNAV	2P/S	1,800	2,000	II	

CANADAIR BOMBARDIER LTD. (Canada)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
CL−41 Tutor (CT−114)	CL41	1J/S			III	
CL−44 Forty Four	CL44	4T/L			III	
CL−44−O Guppy	CL4G	4T/L			III	
CL−66, CV−580 (CC−109	CVLT	2T/L	1,500	1,500	III	
CL−600/Challenger 699/601/604 (CC−144, CE−144)	CL60	2J/L	2,250	3,000	III	8
CL−600 Regional Jet CRJ−100,	CRJ1	2J/L			III	7
CL−600, Regional Jet CRJ−200, RJ−200	CRJ2	2J/L			III	7
CL−600 Regional Jet CRJ−700	CRJ7	2J/L			III	7
CL−600 Regional Jet CRJ−900	CRJ9	2J/L			III	8
T−33, CT−133 Silver Star	T33	1J/L	2,000	2,000	III	

CESSNA AIRCRAFT COMPANY (USA)

(Also AVIONES−COLOMBIA, COLEMILL, DINFIA, ECTOR, FMA, FUJI, REIMS, RILEY, SUMMIT, WREN)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−37 Dragonfly (318D/E),	A37*	2J/S	3,370	3,000	III	
120	C120	1P/S	640	640	I	1
140	C140	1P/S	640	640	I	3
150, A150, Commuter, Aerobat	C150	1P/S	670	1,000	I	1
152, A152, Aerobat	C152	1P/S	750	1,000	I	1
170	C170	1P/S	690	1,000	I	4
172, P172, R172, Skyhawk,	C172	1P/S	650	1,000	I	1
172RG, Cutlass RG	C72R	1P/S	650	1,000	I	1
175, Skylark	C175	1P/S	850	1,000	I	2
177, Cardinal	C177	1P/S	850	1,000	I	2
177, Cardinal RG	C77R	1P/S	850	1,000	I	2
180, Skywagon 180 (U−17C)	C180	1P/S	1,130	1,130	I	2
182, Skylane	C182	1P/S	890	1,000	I	2
R182, TR182 (Turbo) Skylane RG	C82R	1P/S	890	1,000	I	2
185, A185 Skywagon, Skywagon 185, AgCarryall (U−17A/B)	C185	1P/S	1,000	1,000	I	2

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
188, A188, T188 AgWagon, AgPickup AgTruck, AgHusky	C188	1P/S	1,000	1,000	I	1
190	C190	1P/S	1,090	1,090	I	2
195 (LC−126)	C195	1P/S	1,200	1,200	I	
205	C205	1P/S	965	1,000	I	3
206, P206m T206m TP206, U206, TU206, (Turbo) Super Skywagon, (Turbo) Super Skyland, (Turbo) Skywagon 206, (Turbo)	C206	1P/S	975	1,000	I	2
206 (turbine)	C06T	1/T/S			I	
207 (Turbo) Skywagon 207, (Turbo) Stationair 7/8	C207	1P/S	810	1,000	I	2
207 (turbine)	C07T	1T/S			I	
208 Caravan 1, (Super) Cargomaster, Grand Caravan (C−98, U27)	C208	1T/S	1,400	1,400	I	3
210, T210, (Turbo) Centurion	C210	1P/S	900	1,000	I	2
P210 Pressurized Centurion	P210	1P/S	1,000	1,000	I	
P210 (turbine)	C10T	1T/S			I	
T303 Crusader	C303	2P/S	3,500	3,000	II	2
310, T310 (U−3, L−27)	C310	2P/S	2,800	2,000	II	4
320 (Executive) Skyknight	C320	2P/S	2,900	2,000	II	5
335	C335	2P/S	2,200	2,000	II	4
336 Skymaster	C336	2P/S	1,340	1,340	II	
337, M337, MC337, T337B/C/D/E/F/H (Turbo)Super Skymaster (O−2)	C337	2P/S	1,250	1,500	II	3
T337G, P337 Pressurized	P337	2P/S	1,250	1,500	II	3
340	C340	2P/S	2,900	2,000	II	4
401, 402, Utililiner, Businessliner	C402	2P/S	2,500	2,000	II	3
402 (turbine)	C02T	2T/S			II	
404 Titan	C404	2P/S	2,600	2,000	II	5
404 (turbine)	C04T	2T/S			II	
F406 Caravan 2, Vigilant	F406	2T/S	1,850		II	6
411	C411	2P/S	2,800	2,000	II	4
414, Chancellor 414	C414	2P/S	2,300	2,000	II	6
414 (turbine)	C14T	2T/S			II	
421, Golden Eagle, Executive Commuter	C421	2P/S			II	6
421 (turbine)	C21T	2T/S			II	
425, Corsair, Conquest 1	C425	2T/S	3,500	2,500	II	5
441 Conquest, Conquest 2	C441	2T/S	4,200	3,000	II	6
5000 Citation, Citation 1	C500	2J/S	3,100	3,500	III	6
501 Citation 1SP	C501	2J/S	4,300	3,000	III	6
525 Citationjet Citation CJ1	C525	2J/S	3,000		III	7
525A Citation CJ2	C25A	2J/S	3,870		III	
525B Citation CJ3	C25B	2J/S+			III	

526 Citation jet	C526	2J/S	3,000		III	

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
550, S550, 552 Citation 2/S2/Bravo (T−47, U−20)	C550	2J/S+	5,300	3,000	III	7
551 Citation 2SP	C551	2J/S	5,300	3,000	III	5
560 Citation 5/5 Ultra/5Ultra Encore (UC−35, OT−47,	C560	2J/S+	6,000	3,500	III	8
650 Citation 3/6/7	C650	2J/S+	3,900	4,000	III	8
680 Citation Sovereign	C680	2J/S+			III	
750 Citation 10	C750	2J/S+	3,500	3,500	III	9
AW	CAW	1P/S			I	
O−1, TO−1, OE, L−19, TL−19 Bird Dog (305,321)	O1	1P/S	1,150	1,150	I	
T37 (318A/B/C)	T37*	2J/S	3,000	3,000	III	
T−50 Bobcat (AT−8, AT−17, UC−78, Crane)	T50	2P/S			II	
DC−6	CDC6	1P/S			I	
C−34/37/38/145/165, Airmaster	CMAS	1P/S			I	

CHAMPION *(USA−see Bellanca Aircraft)*

CHRISTEN INDUSTRIES, INC.

(USA)

(Also AVIAT)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−1 Huskey	HUSK	1P/S	1,500	1,500	I	

CIRRUS (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
SR−20, SR−20 SRV, SRV	SR20	1P/S			I	1
SR−22	SR22	1P/S			I	1
VK−30 Cirrus	VK3P	1P/S			I	

COLEMILL (USA) *(See BEECH, PIPER, CESSNA)*
CONSTRUCCIONES AERONAUTICAS (CASA) (Spain)

(Also NURTANIO, NUSANTARA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
C−212 Aviocar (T−12, TE−12, TR−12, D−3, Tp89)	C212	2T/S+	900	900	III	5

CURTISS−WRIGHT CORP. (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
C−46 Commando	C46	2P/L	600	700	III	

DASSAULT−BREGUET (France)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
1150 Atlantic, Altantique 2	ATLA	2T/L			III	
Alpha Jet	AJET	2J/S			III	
Falcon 10/100, Mystere 10/100	FA10	2J/S+	2,300	1,600	III	8
Falcon 20/100, Mystere 20/200, Gardian (HU−25,	FA20	2J/S+	2,000	2,200	III	7
Falcon 50, Mystere 50 (T−16)	FA50	3J/S+	1,800	1,600	III	8
Falcon 900, Mystere 900 (T−18)	F900	3J/L	2,000	1,700	III	8
Falcon 2000	F2TH	2J/S+	2,500	1,500	III	8
Jaguar	JAGR	2J/S+			III	
Mirage 2000, Vajara	MIR2	1J/S+			III	
Mirage 3/5/50 (F−103)	MIRA	1J/S+			III	
Mirage F1 (C−14, CE−14)	MRF1	1J/S+			III	
Super Etendard	ETAR	1J/S+			III	

DEHAVILLAND (Canada/UK)

(Also AIRTECH, HAWKER−SIDDELEY, OGMA, RILEY, SCENIC)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
DHC−1	DHC1	1P/S	900	1,000	I	1
DHC−2 Mk1 Beaver (U−6, L−20)	DHC2	1P/S	840	1,000	I	2
DHC−2 Mk3 Turbo Beaver	DH2T	1T/S	1,220	1,000	I	2
DHC−3 Otter (U−1, NU−1, UC)	DHC3	1P/S	750	1,000	I	1
DHC−3 Turbo Otter	DH3T	1T/S			I	
DHC−4 Caribou (C−7, CV−2)	DHC4	2P/S+	1,350	1,000	III	5
DHC−5 (C−8, CV−7, CC−115,	DHC5	2T/L	2,000	1,500	III	1
DHC−6 Twin Otter (UV−18,	DHC6	2T/S	1,600	1,800	II	4
DHC−7 Dash 7 (O−5, EO−5)	DHC7	4T/L	4,000	4,000	III	2
DHC8 – 100 Dash 8 (E−9, CT−142, CC−142)	DH8A	2T/L	1,500	1,500	III	4
DHC8 – 200 Dash 8	DH8B	2T/L	1,500	1,500	III	4
DHC8 – 300 Dash 8	DH8C	2T/L	1,500	1,500	III	5
DHC8 – 400 Dash 8	DH8D	2T/L	2,500	2,500	III	6
DH−104 Dove, Sea Devon	DOVE	2P/S	1,420	1,420	II	4
DH−114 Heron	HERN	4P/S+	1,075	1,075	III	8

DIAMOND (Canada)

(Also HOAC)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
DA−20/22, DV−20 Katana, Speed Katana	DV20	1P/S	525	500	I	2
DA−42 TwinStar	DA42	2P/S	1,100	500	II	2

DORNIER GmbH (FRG)

(Also CASA, HINDUSTAN. Also see FAIRCHILD−DORNIER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
228	D228	2T/S+	2,000	2,000	III	2
328	D328	2T/S+	2,000	2,000	III	7
27	DO27	1P/S	700	800	I	1
Do 28 A/B (Agur)	DO28	2P/S	1,500	1,500	II	
Do 28D/D−1/D−2, 128−2	D28D	2P/S	1,000	−	II	1
Do−28D−6, 128−6 Turbo Skyservant	D28T	2T/S	1,500	−	II	1

ECLIPSE AVIATION (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Eclipse 500	EA50	2J/S	1,725	3,000	III	4

EMBRAER (Brazil)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
CBA−123 Vector	VECT	2T/S+			III	
EMB−110/111 Bandeirante (C−95, EC−95, P−95, R−95,	E110	2T/S+	1,500	1,500	III	7
EMB−120 Brasilia (VC−97)	E120	2T/S+	2,300	2,300	III	7
EMB−121 Xingu (VU−9, EC−9)	E121	2T/S+			III	
EMB−135, ERJ−135/140	E135	2J/L	2,410	2,030	III	7
EMB−145, ERJ−145 (R−99)	E145	2J/L	2,350	2,190	III	7
EMB−145XR	E45X	2J/L			III	7
EMB−170/175	E170	2J/L			III	7
EMB−190/195	E190	2J/L			III	7

EXTRA (FRG)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
200	E200	1P/S	1,000	1,000	I	
230	E230	1P/S	1,500	1,500	I	
300, 350	E300	1P/S	2,500	1,500	I	
400	E400	1P/S	1,500	1,500	I	
500	E500	1T/S	1,800	1,800	I	

FAIRCHILD DORNIER (USA/FRG)

(Also CONAIR, FAIRCHILD−HILLER, FLEET, FOKKER, KAISER, PILATUS, SWEARINGEN)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
228	D228	2T/S+	2,000	2,000	III	
328	D328	2T/S+	2,000	2,000	III	
328JET, Envoy 3	J328	2J/S+			III	6
728JET, Envoy 7	J728	2J/L			III	

FAIRCHILD INDUSTRIES (USA)

(Also CONAIR, FAIRCHILD−HILLER, FLEET, FOKKER, KAISER, PILATUS, SWEARINGEN)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−10, OA−10 Thunderbolt 2	A10*	2J/L	6,000	5,000	III	
C−119, R4Q Flying Box Car	C119	2P/L	750	750	III	5
C−123 Provider	C123	2P/L	890	1,000	III	
F−27, FH−227	F27	2T/L	3,000	3,000	III	5
M−62 (PT−19/23/26, T−19	FA62	1P/S	650	650	I	
Pilatus/Peacemaker/Porter	PC6P	1P/S	580	600	I	
PC−6 Heli−Porter	PC6T	1T/S	580	600	I	
Merlin 2	SW2	2T/S	2,350	2,500	II	6
SA−226TB, SA−227TT Merlin 3, Fairchild 300	SW3	2T/S+	2,350	2,500	III	5
SA−226AC, SA−227AC/AT Metro, Merlin 4, Expediter	SW4	2T/S+	2,400	2,500	III	5

FOKKER BV (Netherlands)

(Also FAIRCHILD, FAIRCHILD−HILLER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
F−27 Friendship, Troopship, Maritime	F27	2T/L	3,000	3,000	III	
F−28, Fellowship	F28	2J/L	4,650	2,000	III	7
50, Maritime Enforcer	F50	2T/L	3,500	3,500	III	3
60	F60	2T/L	3,500	3,500	III	
70	F70	2J/L	4,500	3,000	III	
100	F100	2J/L	3,500	3,500	III	7

GAF (Australia)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
N2/22/24 Nomad, Floatmaster, Missionmaster, Searchmaster	NOMA	2T/S	1,300	1,100	II	2

GATES LEARJET CORP. (USA)

(Also LEAR JET, LEARJET, SHIN MEIWA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
23	LJ23	2J/S	4,500	4,000	III	8
24	LJ24	2J/S+	4,500	4,000	III	7
25	LJ25	2J/S+	4,500	4,000	III	9
28, 29	LJ28	2J/S+	4,500	4,000	III	7
31	LJ31	2J/S+	4,500	4,000	III	7
35, 36 (C−21, RC−35, RC−36,	LJ35	2J/S+	4,500	4,000	III	9
40	LJ40	2J/S+			III	
45	LJ45	2J/S+			III	
55	LJ55	2J/S+	5,000	4,000	III	8
60	LJ60	2J/S+	5,000	4,000	III	10

GENERAL DYNAMICS CORP. (USA)

(Also BOEING CANADA, CANADAIR, CANADIAN VICKERS, CONSOLIDATED, CONVAIR, FOKKER, GRUMMAN, KELOWNA, LOCKHEED, LOCKHEED MARTIN, MITSUBISHI, SABCA, SAMSUNG, TUSAS)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Canso/Catalina***	CAT	2P/S+	600	600	III	7
Convair 240/340/440, Liner,	CVLP	2P/L	1,000	800	III	7
Convair 540/580/600/640	CVLT	2T/L	1,500	1,500	III	7
F−111, EF−111, (RF−111 Aardvark, Raven	F111*	2J/L	5,000	5,000	III	
F−16 A/B/C/D/N, NF−16, TF−16 Fighting Falcon, Netz, Barak,	F16*	1J/L	8,000	5,000	III	
F−16XL Fighting Falcon	F16X*	1J/L			III	
Valiant	VALI	1P/S	600	750	I	

GREAT LAKES (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
2T−1 Sport Trainer, Sport	G2T1	1P/S	1,000	800	I	

GROB (FRG)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
G109 Ranger (Vigilant)	G109	1P/S	600	600	I	2
G115 A/B/C/D/E, Bavarian (Heron), Tutoa	G115	1P/S	1,200	1,100	I	
G−120	G120	1P/S	1,280		I	

GRUMMAN AEROSPACE CORP. (USA)

(Also AERO MOD, AMERICAN GENERAL, GRUMMAN AMERICAN, GULFSTREAM AMERICAN MID−CONTINENT, NORTHROP GRUMMAN, SERV−AERO)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−6, EA−6, KA−6 Intruder, Prowler	A6*	2J/L	7,500	5,000	III	
AA1 Trainer,Tr2, T−Cat, Lynx	AA1	1P/S	850	1,250	I	1
AA−5, Traveller, Cheetah Tiger	AA5	1P/S	660	1,000	I	1
C−1, TF Trader (G−96)	G96	2P/S+			III	
C−2 Greyhound	C2	2T/L	1,000	2,200	III	
E−2, TE−2, Hawkeye, Daya	E2	2T/L	2,690	3,000	III	
F−3F (G−11/32), Replica	F3F	1P/S			I	
F−6F Hellcat (G−50)	HCAT	1P/S+			III	
F−7F Tigercat (G−51)	TCAT	2P/S+			III	
F−9F Panther (G−79)	F9F	1JS+			III	
F−14 Tomcat	F14*	2J/L	6,000	4,000	III	
G−164 Ag−Cat, Super Ag−Cat	G164	1P/S	1,500	1,500	I	1
G164 Turbo Ag−Cat	G64T	1T/S	1,500	1,500	I	1
G−21 A/38/39 Goose (JRF)***	G21	2P/S	1,000	1,000	II	
G−44 Widgeon (J4F)***	G44	2P/S	1,000	1,500	II	5
G−73 Mallard***	G73	2P/S+	1,600	1,600	III	6
G−73T Turbo Mallard***	G73T	2T/S+			III	
G−1159, G−1159B Gulfstream 2/2B/2SP	GLF2	2J/L	5,000	4,000	III	8
GA−7 Cougar	GA7	2P/S	1,600	1,500	II	1
HU−16, SA−16, UF Albatross (G−64/111)***	U16	2P/S+	1,500	1,500	III	4
OV−1, RV−1, AO−1 Mohawk	V1	2T/S+	2,100	1,300	III	
S−2, S2F, P−16 Tracker (G−89)	S2P	2P/S+			III	
S−2 Turbo Tracker	S2T	2T/S+			III	
X−29 (712)	X29	1J/S+			III	

GULFSTREAM AEROSPACE CORP. (USA)

(Also GRUMMAN, GRUMMAN AMERICAN, GULFSTREAM, GULFSTREAM AMERICAN, IAI)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
690 Jetprop Commander 840/900	AC90	2T/S	2,500	2,500	II	
695 Jetprop Commander	AC95	2T/S	2,500	2,500	II	
AA−1 T−Cat, Lynx	AA1	1P/S	850	1,250	I	

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
AA−5 Traveler, Cheetah, Tiger	AA5	1P/S	660	1,000	I	
GA−7 Cougar	GA7	2P/S	1,600	1,500	II	
GAC 159−C, Gulfstream 1	G159	2T/S+	2,000	2,000	III	7
G−1159, G−1159B/TT Gulfstream 2/2B/2SP/2TT	GLF2	2J/L	5,000	4,000	III	
G−1159A Gulfstream 3/SRA−1, SMA−3	GLF3	2J/L	5,000	4,000	III	8
G−1159C Gulfstream 300/4/4SP/ 400/SRA−4 (C−20F/G/H, S102, Tp102,	GLF4	2J/L	5,000	4,000	III	8
G−1159D Gulfstream 5/500/550 (C−37)	GLF5	2J/L	5,000	4,000	III	7

HAMILTON AVIATION (USA)

(Also VOLPAR)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Westwind 2/3	B18T	2T/S	2,000	2,000	II	1
Little Liner	BE18	2P/S	1,400	1,000	II	
T−28 Nomair	T28	1P/S	2,500	2,500	I	

HANDLEY PAGE (UK)

(Also BRITISH AEROSPACE, JETSTREAM, SCOTTISH AVIATION, VOLPAR)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
HP−137 Jetstream 1	JS1	2T/S+	2,200	2,200	III	
HP−137 Jetstream 200	JS20	2T/S+	2,200	2,200	III	

HELIO AIRCRAFT COMPANY (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
H−391/392/395/250/295/700/800, HT−295 Courier, Strato−Courier, Super	COUR	1P/S	850	1,000	I	1
HST−550 Stallion (AU−24)	STLN	1T/S	2,200	2,200	I	1
H−500 Twin Courier (U−5)	TCOU	2P/S	1,250	1,500	II	1

HFB (FRG)

(Also MBB)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
HFB−320	HF20	2J/S+	4,500	4,500	III	7

HOWARD (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
250, 350	L18	2P/L	1,800	2,000	III	8
DGA−15 (GH Nightingale, NH)	DG15	1P/S	1,000	1,000	I	

IAI (Israel)

(Also ISRAEL AIRCRAFT INDUSTRIES, ASTRA, GULFSTREAM)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
101 Avara, 102, 201, 202	ARVA	2T/S+	1,300	1,000	III	5
1123 Westwind	WW23	2J/S+	4,000	3,500	III	7
1124 Westwind	WW24	2J/S+	4,000	3,500	III	7
1125 Gulfstream 100, (C−38)	ASTR	2J/S+	4,000	3,500	III	7
1126 Gulfstream 200	GALX	2J/S+			III	
Gulfstream 150	G150	2J/S+			III	

ILYUSHIN (Russia)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−50, Be−976	A50	4J/H			III	
Il−14	IL14	2P/S+			III	
Il−18/20/22/24, Bizon, Zebra	IL18	4T/L			III	
Il−28	IL28	2J/L			III	
Il−38	IL38	4J/L			III	
IL−62	IL62	4J/H	3,500	2,500	III	
IL−76/78/82, Gajaraj	IL76	4J/H	3,000	2,500	III	
Il−86/87	IL86	4J/H			III	
Il−96	IL96	4J/H			III	
Il−103	I103	1P/S			I	
Il−114	I114	2T/L			III	

JETSTREAM (UK − see British Aerospace)

LAKE AIRCRAFT (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
LA−250/270 (Turbo) Renegade, Seawolf, SeaFury***	LA25	1P/S	700	700	I	2
LA−4/200, Buccaneer***	LA4	1P/S	1,100	1,000	I	2

LOCKHEED CORP. (USA)

(Also AERITALIA, CANADAIR, FIAT, FOKKER, HOWARD, LEAR, LOCKHEED−BOEING, LOCKHEED−MARTIN, MBB, MESSERSCHMITT, MITSUBISHI, PACAERO, ROCKWELL, SABCA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
B−34, PV Venture, Harpoon (L−15/137/237)	L37	2P/S+			III	
C−5 Galaxy (L−500)	C5	4J/H	2,500	2,000	III	
C−130A/B/E/F/H, CC−130, DC−130, EC−130/E/G/H/Q, HC−130, JC−130, KC−130B/F/H/R/T, LC−130, MC−130, NC−130, RC−130, TC−130, VC−130, WC−130E/H, T−10, TK−10, TL−10, Tp84	C130	4T/L	1,500	1,500	III	
C−141 Starlifter (L−300)	C141	4J/H	3,500	3,000	III	
L−049/749/1049 Constellation, Super Constellation, Starliner (C−121, RC−121, EC−121, VC−121, WV, R7V, Warning	CONI	4P/L	1,700	1,700	III	9
F−22 Raptor (L−645)	F22*	2J/L			III	
F−104, RF−104, TF−104 Starfighter (L583/683)	F104*	1J/L	5,000	4,000	III	
F−117 Nighthawk	F117	2J/L			III	
L−1011 Tri−Star (all series)	L101	3J/H	3,500	3,000	III	9
L−18 Lodestar (C−56/57/59/60, R50, XR50)	L18	2P/L	1,800	2,000	III	
L−188 Electra	L188	4T/L	1,850	2,000	III	7
L−1329 Jetstar 6/8	L29A	4J/L	4,000	3,500	III	8
L−1329−5 Jetstar 2/731	L29B	4J/L	4,000	3,000	III	9
P−2D to H, SP−2, P2V Neptune (L−426/726/826)	P2	2P/L			III	
P−3, AP−3, EP−3, NP−3, RP−3, TP−3, UP−3, VP−3, WP−3, CP−140 Orion, Aurora, Arcturus	P3	4T/L	1,850	2,000	III	
P−38, F−5 Lightning	P38	2P/S+			III	
S−3, ES−3, US−3 Viking (L−394)	S3	2J/L	2,000	2,000	III	
SR−71 Blackbird	SR71	2J/L			III	
T−33, AT−33, NT−33, RT−33 Shooting Star, T−Bird (L−580)	T33*	2J/L	2,000	2,000	III	
U−2, ER−2	U2*	1J/S+	6,000	6,000	III	

MARTIN COMPANY (USA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
404	M404	2P/L	1,600	1,500	III	3
B−26 Marauder (179)	B26M	2P/S+			III	
WB−57 (272)	WB57	2J/L			III	

MAULE AIRCRAFT CORP. (USA)

(Also SAASA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
M−4 Bee Dee, Jetasen, Rocket, Astro Rocket,	M4	1P/S	1,000	1,000	I	1
M−5, Strata Rocket, Lunar Rocket, Patroller	M5	1P/S	1,000	1,000	I	1
M−6 Super−Rocket	M6	1P/S	1,500	1,000	I	1
M−7−235/260, MT−7−235/260, MX−7−160/180/235, MXT−7−160/180 Super Rocket, Star Rocket, Comet, Star Craft,	M7	1P/S	825		I	1
M−7−420, MT−7−240, MX−7−420, MXT−7−420 Star	M7T	1T/S	4,500		I	1
M−8	M8	1P/S			I	

MCDONNELL−DOUGLAS CORP. (USA)

(Also ASTA, BOEING, DOUGLAS, GAF, LISUNOV, MITSUBISHI, ON MARK, SHANGHAI, VALMET)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Skywarrior	A3*	2J/L	5,000	6,000	III	
A−4, OA−4, TA−4 Skyhawk	A4*	1J/S+	5,000	5,000	III	
Invader	B26	2P/L	1,000	1,000	III	
YC−15	C15	4J/L			III	
C−17 Globemaster 3	C17	4J/H			III	
DC−10 (KC−10 Extender, KDC−10, MD−10)	DC10	3J/H	2,400	2,000	III	9
Skytrain (C−47, C−53, C−117 A/B/C, R4D 1 to 7)	DC3	2P/S+	1,200	1,200	III	
Super DC−3 (C−117D, R4D 8)	DC3S	2P/S+	1,330	1,330	III	8
Skymaster	DC4	4P/L	2,300	2,300	III	7
DC−6/B Liftmaster	DC6	4P/L	1,000	1,000	III	7
DC−7/B/C Seven Seas	DC7	4P/L	1,250	1,250	III	8
DC−8−50, Jet Trader	DC85	4J/H	4,000	4,000	III	9
DC−8−60	DC86	4J/H	4,000	4,000	III	
DC−8−70	DC87	4J/H	5,000	4,000	III	9
DC−9−10	DC91	2J/L	3,000	3,000	III	8
DC−9−20	DC92	2J/L	3,000	3,000	III	8
DC−9−30 (C−9, VC−9, Nightingale, Skytrain 2)	DC93	2J/L	3,000	3,000	III	8

DC−9−40	DC94	2J/L	3,000	3,000	III	8
DC−9−50	DC95	2J/L	3,000	3,000	III	8
F−15 Eagle, Baz, Akef, Ra'am	F15*	2J/L	8,000	5,000	III	
FA−18, CF−18, CF−188, EF−18, C−15, CE−15, AF−18,	F18*	2J/L	8,000	6,000	III	
F−4, RF−4, QF−4 Phantom 2/2000, Kurnass	F4*	2J/L	8,000	6,000	III	

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
MD−1	MD11	3J/H			III	9
MD−8	MD81	2J/L	3,500	3,000	III	7
MD−8	MD82	2J/L	3,500	3,000	III	7
MD−8	MD83	2J/L	3,500	3,000	III	8
MD−8	MD87	2J/L	3,500	3,000	III	7
MD−8	MD88	2J/L	3,500	3,000	III	8
MD−9	MD90	2J/L			III	8

MESSERSCHMITT (FRG)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Bf−108 Taifun	ME08	1P/S	400	500	I	1
Bf−109	ME09	1P/S			I	
Me−262, Replica	ME62	2J/S+			III	

MESSERSCHMITT−BOLKOW (FRG)

(Also BOLKOW, HFB, NORD, SIAT)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
223 Flamingo	S223	1P/S			I	
BO−209 Monsun	B209	1P/S	1,100	1,100	I	4

MITSUBISHI AIRCRAFT INTERNATIONAL INC. (USA/Japan)

(Also BEECH, RAYTHEON)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A6M Zero	ZERO	1P/S			I	
F−1	F1	2J/S+			III	
F−2	F2	1J/L	8,000	5,000	III	
F−86 Sabre	F86	IJ/L	4,000	4,000	III	
MU−2, Marquise, Solitaire	MU2	2T/S	3,500	3,000	II	6
MU−300 Diamond	MU30	2J/S+	3,500	4,000	III	7
T−2	MT2	2J/S+			III	

MOONEY AIRCRAFT CORP. (USA)

(Also AEROSTAR, ALON)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−2 Aircoupe	ERCO	1P/S	630	630	I	2
M−10 Cadet	M10	1P/S	800	800	I	1
M−18 Mite, Wee Scotsman	MITE	1P/S	750	750	I	1
M−20, M−20/A/B/C/D/E/F/G/J/L/R/S, Mark 21, Allegro, Eagle, Ranger, Master, Super 21, Chaparral, Executive, Statesman, Ovation, 201, 202,	M20P	1P/S	1,000	1,000	I	4
M−20K/M, Encore, Bravo, 231, 252, TLS, TSE (turbocharged	M20T	1P/S	1,500	1,200	I	6
M−22, Mustang	M22	1P/S	1,300	1,300	I	3

MUDRY (France)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
CAP−10	CP10	1P/S	1,500	2,000	I	4
CAP−20	CP20	1P/S	1,500	2,000	I	4
CAP−21	CP21	1P/S			I	
CAP−230/231/232	CP23	1P/S			I	
D−140 Mousquetaire	D140	1P/S			I	

NAMC (Japan)

(Also MITSUBISHI)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
YS−11	YS11	2T/L	1,500	1,500	III	6

NAVION (USA)

(Also CAMAIR, RILEY, TEMCO)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Rangemaster	RANG	1P/S	1,250	1,500	I	1

NOORDYUN AVIATION LTD. (Canada)

(Also CCF)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Norseman Mk	NORS	1P/S	700	1,000	I	2

NORD (France)

(Also AEROSPATIALE, HOLSTE, NORDFLUG, TRANSALL)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Transall C−160	C160	2T/L	2,000	2,000	III	
260 Super Broussard	N260	2T/S+	2,500	2,000	III	
262, Frégate, Mohawk 298	N262	2T/S+	2,500	2,000	III	
1000, 1001, 1002 Pingouin	ME08	1P/S	400	500	III	
1101, 1102, Noralpha, Ramier	N110	1P/S			I	
1200 to 1204 Norecrin	N120	1P/S			I	
2501 to 2508 Noratlas	NORA	2P/L	1,500	1,500	III	
3202	N320	1P/S			I	
3400	N340	1P/S			I	
SV−4	SV4	1P/S			I	

NORTHERN AVIATION *(USA−see Bellanca)*

NORTHROP CORP. (USA)

(Also CANADAIR, CASA, AIDC, F+W EMMEN, KOREAN AIR, NORTHROP GRUMMAN)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
B−2 Spirit	B2	4J/H			III	
C−125 Raider	C125	3P/L			III	
E−2 Hawkeye	E2	2T/L	2,690	3,000	III	
F−5, RF−5 Freedom Fighter, Tiger 2, Tigereye (N−156C/F)	F5*	2J/S+	8,000	5,000	III	
P−61 Black Widow	P61	2P/S+			III	
T−38, AT−38 Talon (N−156T)	T38*	2J/S+	8,000	5,000	III	

PARTENAVIA (Italy)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
AP−68TP−300 Spartacus	P68T	2T/S	1,500	1,500	II	3
AP−68TP−600 Viator	VTOR	2T/S	1,500	1,500	II	8
P−57 Fachiro 2	P57	1P/S			I	
P−64/66 Oscar, Charlie	OSCR	1P/S	800	1,000	I	2
P68,Victor, Observer	P68	2P/S	1,200	1,000	I	3

PIAGGIO (Industrie Aeronautiche E Meccaniche Rinaldo Piaggio SpA) (Italy)

(Also PIAGGIO−DOUGLAS, TRECKER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
P−136***	P136	2P/S	1,250	1,500	II	4
P−148	P148	1P/S			I	
P−149	P149	1P/S			I	
P−166, P−166A/B/C/DL2/M/S, Portofino, Albatross	P66P	2P/S	1,350	1,500	II	3
P−166DL3/DP1	P66T	2T/S			II	
P−180 Avanti	P180	2T/S			II	1
PD−808	P808	2J/S+	4,000	3,500	III	9

PILATUS FLUGZEUGWERKE AG (Switzerland)

(Also FAIRCHILD, FAIRCHILD−HILLER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
P−2	PP2	1P/S			I	
P−3	PP3	1P/S			I	
PC−6 Porter	PC6P	1P/S	600	600	I	
PC−6A/B/C Turbo Porter (UV−20 Chiricahua)	PC6T	1T/S	1,250	1,500	I	
PC−7 Turbo Trainer (AT−92,	PC7	1T/S	2,800		I	1
PC−9, Hudurnik	PC9	1T/S			I	
PC−12, Eagle	PC12	1T/S	1,900		I	4

PIPER AIRCRAFT CORP. (USA)

(Also AEROSTAR, AICSA, CHINCUL, COLEMILL, EMBRAER, INDAER CHILE, JOHNSTON, MACHEN, MILLER, NIEVA, SCHAFER, SEGUIN, PZL−MIELEC, TED SMITH, WAGAERO)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
AP−60, Aerostar	AEST	2P/S	1,500	1,500	II	
J−2 Cub	J2	1P/S	500	500	I	1
J−3 Cub (L−4, NE)	J3	1P/S	500	500	I	1
J−4 Cub Coupe	J4	1P/S	500	500	I	1
J−5 Cub Cruiser (L−14, AE)	J5	1P/S	500	500	I	1
PA−11 Cub Special (L−18B)	PA11	1P/S	500	500	I	1
PA−12 Super Cruiser	PA12	1P/S	600	600	I	1
PA−14 Family Cruiser	PA14	1P/S	600	600	I	1
PA−15 Vagabond	PA15	1P/S	500	500	I	1
PA−16 Clipper	PA16	1P/S	500	500	I	1
PA−17 Vagabond, Vagabond	PA17	1P/S	500	500	I	1
PA−18 Super Cub (L−18C, L−21, U−7)	PA18	1P/S	1,000	1,000	I	1
PA−20 Pacer	PA20	1P/S	850	1,000	I	1
PA−22 Tri−Pacer, Caribbean,	PA22	1P/S	1,000	1,000	I	2
PA−23−150/160 Apache	PA23	2P/S	1,050	1,000	II	2

PA−24 Comanche	PA24	1P/S	900	1,000	I	4

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
PA−25 Pawnee	PA25	1P/S	650	650	I	1
PA−23−235/250 Aztec, Turbo Aztec (U−11, E−19, UC−26)	PA27	2P/S	1,500	1,500	II	3
PA−28−140/150/151/ 160/161/180/181Archer, Cadet, Cherokee, Cherokee Archer/ Challenger/Chief/Cruiser/Flite Liner/ Warrior	P28A	1P/S	750	1,000	I	1
PA−28−201T/235/236 Cherokee, Cherokee Charger/Pathfinder, Dakota, Turbo Dakota	P28B	1P/S	900	1,000	I	3
PA−28R−1802/3, Turbo Arrow 3/200/201 Cherokee	P28R	1P/S	750	1,000	I	3
PA−28RT Arrow 4, Turbo Arrow	P28T	1P/S	900	1,000	I	2
PA−30/39 Twin Comanche, Twin Comanche CR, Turbo Twin	PA30	2P/S	1,500	1,500	II	1
PA−31/31P Navajo, Navajo Chieftain, Chieftain, Pressurized Navajo, Mohave,	PA31	2P/S	1,500	1,500	II	2
PA−32 Cherokee Six, Six, Saratoga, Turbo Saratoga, 6, 6XT	PA32	1P/S	850	1,000	I	3
PA−32R Cherokee Lance, Lance, Saratoga SP/2 HP/2TC, Turbo Saratoga	P32R	1P/S	850	1,000	I	3
PA−32RT Lance 2, Turbo Lance	P32T	1P/S	850	1,000	I	4
PA−34 Seneca	PA34	2P/S	1,300	1,300	II	7
PA−36 Pawnee Brave	PA36	1P/S	800	1,000	I	2
PA−38 Tomahawk	PA38	1P/S	750	750	I	3
PA−44, Seminole, Turbo	PA44	2P/S	1,100	1,000	II	2
PA−46 310P/350P Malibu, Malibu Mirage	PA46	1P/S	1,000	1,000	I	4
PA−46−500TP Malibu Meridian	P46T	1T/S	1,500	1,500	I	4
PA−31T3−500 T−1040	PAT4	1P/S	1,300	1,200	I	
PA−31T1−500 Cheyenne 1	PAY1	2T/S	2,200	2,000	II	5
PA−31T−620.T2−620 Cheyenne, Cheyenne 2	PAY2	2T/S	2,400	2,000	II	2
PA−42−720 Cheyenne 3	PAY3	2T/S	2,400	2,000	II	8
PA−42−1000 Cheyenne 400	PAY4	2T/S	2,500	2,000	II	4
PA−28R−300 Pillán	PILL	1P/S	750	1,000	I	
108 Voyager, Station Wagon 108	S108	1P/S	800	800	I	2

PITTS AEROBATICS (Manufactured by Christen Industries, Inc.)(USA)

(Also AEROTEK, AVIAT, CHRISTEN, KIMBALL)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
S−1 Special	PTS1	1P/S	1,500	1,500	I	
S−1−11 Super Stinker	PTSS	1P/S			I	
S−2 Special	PTS2	1P/S	1,500	1,500	I	
S−12 Macho Stinker, Super	PTMS	1P/S			I	

RAYTHEON (See

BEECH) ROBIN

(France)

(Also APEX)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
R−1180 Aiglon	R100	1P/S			I	
R−2100/2112/2120/2160, Alpha, Alpha Sport, Super Club	R200	1P/S			I	
R−300/3000/3100/3120/3140	R300	1P/S			I	

ROCKWELL INTERNATIONAL CORP. (USA)

(Also AERO COMMANDER, CANADAIR, CCF, COMMANDER, COMMONWEALTH, GULFSTREAM, HAMILTON, MITSUBISHI, NOORDUYN, NORTH AMERICAN PACAERO, NORTH AMERICAN ROCKWELL, PACIFIC AIRMOTIVE, ROCKWELL, RYAN, SUD, TUSCO)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
100 Commander 100	VO10	1P/S	850	850	I	1
112, 114 Commander 112/114, Alpine Commander, Gran Turismo Commander	AC11	1P/S	1,000	1,200	I	2
200 Commander 200	M200	1P/S	1,400	1,000	I	1
500 Shrike Commander	AC50	2P/S	1,340	1,500	II	3
Commander 520	AC52	2P/S	1,340	1,500	II	1
560 Commander 560	AC56	2P/S	1,400	1,500	II	4
680F, 680FP, Commander	AC68	2P/S	1,375	1,375	II	5
680FL, Grand Commander,	AC6L	2P/S	1,250	1,250	II	6
720 Alti−Cruiser	AC72	2P/S	1,300	1,300	II	4
680T, 680V Turbo Commander	AC80	2T/S	2,000	1,500	II	4
690 Turbo Commander 690, Jetprop	AC90	2T/S	2,500	2,500	II	6
695 Jetprop Commander	AC95	2P/S	2,500	2,500	II	6
700, 710 Commander 700/710	RC70	2P/S			II	

AC−130 Spectre	C130	4T/L	1,500	1,500	III	
B−1 Lancer	B1*	4J/H	3,000	5,000	III	
FR−06 Fanranger, Ranger 2000	R2TH	1J/S			III	
Mitchell	B25	2P/L	980	980	III	
Sabre	F86*	1J/L	4,000	4,000	III	

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Jet Commander 1121	JCOM	2J/S+	5,000	4,500	III	9
Lark 100 Commander	LARK	1P/S	700	1,000	I	1
Navion NA 145/154	NAVI	1P/S	750	600	I	2
Mustang	P51	1P/S	2,500	2,500	III	
NA−265 Sabre 40/60/65	SBR1	2J/S+	4,000	3,500	III	
NA−265 Sabre 75/80	SBR2	2J/S+			III	
OV−10 Bronco	V10	2T/S	2,000	2,500	II	
S−2 Thrush Commander	SS2P	1P/S			I	
Super Sabre F−100	SSAB	1J/L	4,000	4,000	III	
T−2 Buckeye	T2*	2J/L	5,700	6,000	III	
Trojan, Nomair, Nomad	T28	1P/S	2,500	2,500	III	
Texan, Harvard	T6	1P/S	800	800	I	2
Darter 100	VO10	1P/S	850	850	I	
X−31	X31	1J/S+			III	

RUSCHMEYER (FRG)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
R−90−230FG	R90F	1P/S	1,000	1,000	I	
R−90−230RG,MF−85	R90R	1P/S	1,000	1,000	I	
R−90−420AT	R90T	1T/S	1,100	1,100	I	

SAAB (Sweden/USA)

(Also SAAB−FAIRCHILD)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
29 (J29)	SB29	1J/S			III	
32 Lansen (J32)	SB32	1J/S+			III	
35 Draken (J35, Sk35, F−35, RF−35, TF−35)	SB35	1J/S+			III	
37 Viggen (AJ37, AJS37, JA37, SP37, SH37, Sk37)	SB37	1J/S+			III	
39 Gripen (JAS39)	SB39	1J/S+			III	
91 Safir (Sk50)	SB91	1J/S			III	
105 (Sk60)	SB05	2J/S			III	
340	SF34	2T/L	2,000	2,000	III	5
2000	SB20	2T/L			III	

MFI−15/17 Safari, Supporter (T−17)	MF17	1P/S			I	

SHORT BROTHERS LTD. (UK)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
330, Sherpa (C−23), SD3−30	SH33	2T/S+	1,380	1,380	III	6
360, SD3−60	SH36	2T/S+	1,400	1,400	III	6
SC−5 Belfast	BELF	4T/L			III	
SC7 Skyvan, Skyliner	SC7	2T/S	1,500	1,500	II	2

SILVAIRE (USA)

(Also LUSCOMBE, TEMCO)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
8	L8	1P/S	900	1,000	I	3

SOCATA (See AEROSPATIALE)

STINSON (USA)

(Also PIPER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
10, 105, HW−75, HW−80,	S10	1P/S	750	1,000	I	
108 Voyager, Station Wagon	S108	1P/S	750	1,000	I	
L−5, U−19, OY Sentinel (V−76)	L5	1P/S	750	750	I	
SR, V−77 Reliant (AT−19)	RELI	1P/S	700	700	I	3

SUD AVIATION *(See Aerospatiale)*

SWEARINGEN AVIATION *(USA−see Fairchild Industries)*

TAYLORCRAFT AVIATION CORP. (USA)

(Also TAYLOR KITS)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
15 Tourist, Foursome	TA15	1P/S	800	1,000	I	
19, F−19 Sportsman	TF19	1P/S	800	1,000	I	1
20 Ranchwagon, Topper, Seabird, Zephyr 400	TA20	1P/S	1,000	1,000	I	4
A	TAYA	1P/S			I	
BC, BF, BL, Ace, Sportsman,	TAYB	1P/S			I	
DC, DCO, DF, DL (O−57, L−2)	TAYD	1P/S			I	
F−21	TF21	1P/S	1,100	1,100	I	4
F−22 Classic, Tri−Classic, Ranger, Trooper, Tracker	TF22	1P/S	875		I	

TED SMITH AEROSTAR CORP. (USA)

(Also AEROSTAR, AICSA, MACHEN, PIPER)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Aero	AEST	2P/S	1,800	1,500	II	5

VFW−FOKKER (Zentralgesellschaft VFW−Fokker mbH (FRG/Netherlands))

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
VFW	VF14	2J/L	3,100	3,000	III	8

VOUGHT CORP. (USA)

(Also GLOBE, LTV, TEMCO)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
A−7, TA−7 Corsair	A7*	1J/L	8,000	6,000	III	
Swift	GC1	1P/S	1,000	1,000	I	2

YAKOVLEV (RUSSIA)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
Yak−4	YK40	3J/S+			III	8

ZENAIR (Canada)

(Also ZENITH)

Model	Type Designator	Description	Performance Information			
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.	LAHSO Group
CH−600/601 Zodiac, Super	CH60	1P/S			I	
CH−620 Gemini	CH62	2P/S			II	
CH−801 Stol	CH80	1P/S			I	
CH−2000 Zenith	CH2T	1P/S	780		I	

Aircraft Information -Helicopters/Rotorcrafts

TYPE ENGINE ABBREVIATIONS

P	piston
T	jet/turboprop
J	jet

CLIMB AND DESCENT RATES

Climb and descent rates based on average en route climb/descent profiles at median weight between maximum gross takeoff and landing weights.

SRS

SRS means "same runway separation;" categorization criteria is specified in para 3-9-6, Same Runway Separation.

MANUFACTURERS

Listed under the primary manufacturer are other aircraft manufacturers who also make versions of some of the aircraft in that group.

AEROSPATIALE (France)

(Also ATLAS, CASA, CHANGHE, EUROCOPTER, HELIBRAS, HINDUSTAN, IAR, ICA, NURTANIO, NUSANTARA, REPUBLIC, SINGAPORE, SUD, WESTLAND)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Lama SA−315	LAMA	1T/S	1,000	1,000	I
Alouette 2	ALO2	1T/S	1,280	1,280	I
Alouette 3	ALO3	1T/S	1,500	1,500	I
Dauphine SA−360/361	S360	1T/S	1,400	1,500	I
Dauphine 2 SA−365C	S65C	2T/S	1,800	1,000	I
Ecurevil/AStar AS−350/550	AS50	1T/S	1,000	1,000	I
Gazelle SA−341/342	GAZL	1T/S	1,620	1,620	I
Puma SA−330 (CH−33, HT−19)	PUMA	2T/L	1,250	1,500	I
Super Puma AS 332/532, SA−330)	AS32	2T/L	1,250	1,500	I
Super Frelon SA−321/Z−8	FREL	3T/L	1,200	1,500	I
Twin Star AS−355/555	AS55	2T/S	1,350	1,300	I

AUGUSTA (Constuzioni Aeronautiche Giovanni Agusta SpA) (Italy)

(Also BELL, NUSANTARA, SABCA)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model 147J−3B−1, Ranger	B47J	1P/S	500	500	I
Model A 109/A/A−II	A109	2T/S	1,620	1,500	I
Model 212 ASW, Griffon	B12	2T/S	1,420	1,420	I

BELL/BOEING

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Ospre	V22	2T/L	–	–	II

BELL HELICOPTER TEXTRON (USA)

(Also AGUSTA, AIDC, COMMONWEALTH, DORNIER, FUJI, GLOBAL, KAWASAKI, NUSANTARA, TROOPER, UNC, WESTLAND)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Biglifter, Bell 204, 205, 214A/B, AB−204	UH1	1T/S	1,500	1,500	I
Cobra	HUCO	1T/S	1,375	1,375	I
Jet Ranger/Long Ranger/ Sea Ranger/Kiowa/Model	B06	1T/S	1,200	1,000	I
Huey/Iroquois/Model 205 A−1	UH1	1T/S	1,500	1,500	I
Ranger Model 47J	B47J	1P/S	1,000	1,000	I
Sioux/Model 47G, OH−13	B47G	1P/S	1,000	1,000	I
Twin Huey, Model 212, Model 214B/B−1, Model 412, Griffon	B12	2T/S	1,420	1,420	I
Model 214ST, Super Transport	BSTP	2T/S	1,420	1,420	I
Model 222, 230, 430	B222	2T/S	1,500	1,000	I

BOEING VERTOL COMPANY (USA)

(Also BOEING HELICOPTERS, KAWASAKI, MERIDIONALI, VERTOL)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Chinook, Model 234	H47	2T/L	1,500	1,500	I
Sea Knight 107, CH−113,	H46	2T/S+	2,130	2,130	I

BOLKOW (Germany)

(Also CASA, EUROCOPTER, MBB, MESSERSCHMITT−BOLKOW, NURTANIO, NUSANTARA, PADC)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model 105,	B105	2T/S	1,500	1,500	I

BRANTLEY−HYNES HELICOPTER, INC. (USA)

(Also BRANTLEY, HYNES)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model B−2/A/B,	BRB2	1P/S	1,400	1,400	I
Model	B305	1P/S	1,300	1,300	I

ENSTROM CORP. (USA)

(Also WUHAN)

Model	Type Designator	Description	Performance		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Falcon/Model F−28/A/C/F, Sentinel/ Model F−28−FP,	EN28	1P/S	800	800	I
Shark/Model 280FX, 28, Falcon, Sentinel	EN28	1P/S	1,200	1,200	I
Turbo Shark 480, TH−28	EN48	1P/S	1,500	1,500	I

FAIRCHILD/REPUBLIC (includes Hiller) (USA)

(Also FAIRCHILD HILLER, ROGERSON HILLER)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Hiller UH−12/Raven,	UH12	1P/S	1,500	1,500	I

HILLER (See FAIRCHILD/REPUBLIC (USA))

HUGHES HELICOPTERS (See MCDONNELL−DOUGLAS

HELICOPTERS (USA)) KAMAN AEROSPACE

CORPORATION USA)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
H−2 Seasprite, Super Seasprite	H2	2T/L	2,400	2,400	I
Huskie 600−3/5	H43B	1T/L	2,000	2,000	I

KAWASAKI HEAVY INDUSTRIES LTD. (Japan)

(Also BOEING VERTOL, VERTOL)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
KV−107/II, Sea Knight, Labrador, Voyaguer, CH−113	H46	2T/S+	1,500	1,500	I

MCDONNELL−DOUGLAS HELICOPTERS (includes Hughes Helicopters) (USA)

(Also AGUSTA, BREDANARDI, KAWASAKI, KOREAN AIR, NARDI, RACA, SCHWEIZER)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model 77/Apache, Pethen, Longbow Apache	H64	2T/S+	1,500	1,500	I
Model 269, 200, 280, 300, Skynight, TH−55 Osage	H269	1P/S	1,000	1,000	I
Model 300/C	H269	1P/S	1,200	1,200	I
Model 500C, 369, 530F, Defender, Black Tiger, Night	H500	1P/S	1,500	1,500	I
Osage	H269	1P/S	1,000	1,000	I
Pawnee, Model 369, Model 500D/MD/MG	H500	1T/S	1,500	1,500	I

MESSERSCHMIDTT−BOLKOW−BLOHM (MBB) (FRG)

(Also BOLKOW, CASA, EUROCOPTER, MBB, NURTANIO, NUSANTARA, PADC)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model BO	B105	2T/S	1,200	1,200	I

MBB/KAWASAKI (FRG/Japan)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model BK	BK17	2T/S	1,500	1,500	I

ROBINSON HELICOPTER COMPANY INC. (USA)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model	R22	1P/S	800	800	I

SCHWEIZER AIRCRAFT CORP. (USA)

(Also BREDANARDI, HUGHES, KAWASAKI, NARDI)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Model 269C, 200, 280, 300, Skynight	H269	1P/S	1,000	1,000	I
269D, 330, 333	S330	1T/S			I

SIKORSKY AIRCRAFT (USA)

(Also AGUSTA, ASTA, HAWKER DE HAVILLAND, HELIPRO, KOREAN AIR, MITSUBISHI, TUSAS, UNITED CANADA, VAT, WESTLAND)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/ Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Blackhawk S−70, WS−70, Seahawk, Pavehawk, Rescuehawk, Thunderhawk, Jayhawk, Oceanhawk, Deserthawk, Yanshuf, LAMPS	H60	2T/S+	2,000	2,000	I
Chickasaw S−55, H−19, HO4S,	S55P	1P/S	800	1,000	I
Choctaw/Seashore/Seaboat S−58, CH−34	S58P	1P/L	1,120	1,120	I
Model S−51	S51	1P/L	1,000	1,000	I
Model S−52, Hummingbird	S52	1P/L	950	1,000	I
Model S−62	S62	1T/S	1,020	1,000	I
Model S−76, Spirit, Eagle	S76	2T/S	1,300	1,300	I
S−61R (CH−3, HH−3, Pelican)	S61R	2T/L	1,500	1,500	I
S−61A/B/D/L/N Sea King, Commando, CH−124	S61	2T/L	1,500	1,500	I
Sea Stallion S−65, Yasur	H53	2T/L	1,500	1,500	I
Skycrane S−64E/F, Tarhe S−64	S64	2T/L	1,300	1,300	I

WESTLAND HELICOPTERS LTD. (UK)

Model	Type Designator	Description	Performance Information		
		Number & Type Engines/Weight Class	Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
WG	WG30	2T/S	1,200	1,200	I

Aircraft Information – Specific Homebuilt/Experimental Aircraft

Homebuilt and Experimental Aircraft*

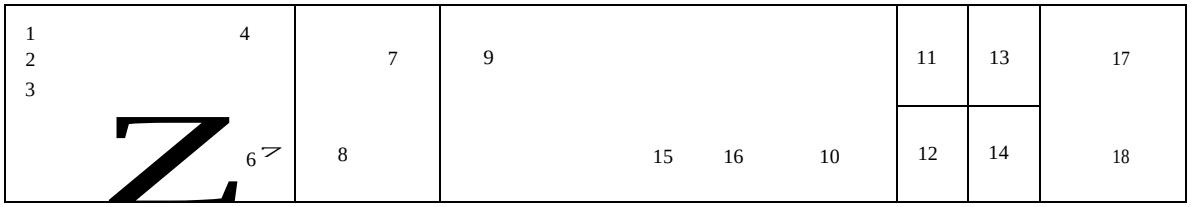
Designator Criteria	Type Designator	Performance Information**		
		Climb Rate (fpm)	Descent Rate (fpm)	SRS Cat.
Aircraft with cruise (indicated) airspeeds of 100 knots or less	HXA	500	500	I
Aircraft with cruise (indicated) airspeeds of greater than 100 knots, up to and including 200 knots	HXB	750	750	I
Aircraft with cruise (indicated) airspeeds greater than 200 knots	HXC	1,000	1,000	I

NOTE−
**Configuration diversity and the fact that airworthiness certificates are issued to aircraft builders, vice manufacturers, necessitates the assignment of generic aircraft type designators based on cruise performance, rather than specific manufacturer and normal descriptive/performance information.*

***All performance criteria have been estimated because configuration diversity precludes determining precise aircraft−specific information.*

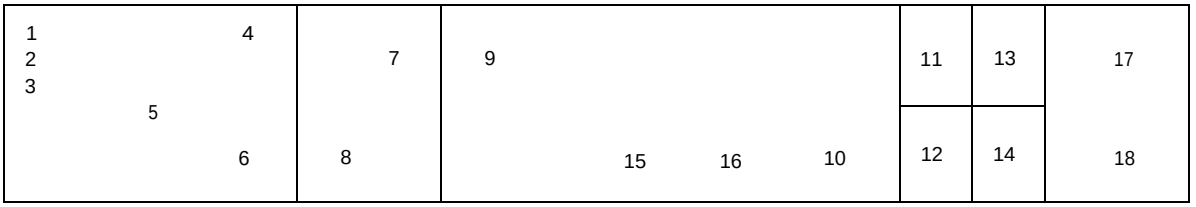
APPENDIX B. STRIPMARKING GUIDE

IFR/Radar Departures Nassau



1. Aircraft Identification Prefix identification with company identifier.
2. Type of aircraft. Transponder, DME capability/TAS optional. Prefix type with number of aircraft, when more than one. 'H' for heavy aircraft.
3. Beacon code/ATIS code.
4. Departure point.
5. Initial route of flight. For short range clearances, indicate radial and DME fix if required.
6. Estimated time of departure (ETD).
7. ATD. UP arrow (↑) indicating departure. Departure transition Area (DTA) e.g., PEA.
8. Destination.
9. Level or altitude information. Control Data.
10. Transfer of control point, when applicable.
11. Runway to be used. Indicate intersection when used. (Circle, or tick, when coordination is complete for use of runway other than the runway in use).
12. Radar contact (R), Radar services terminated Time *(1).* Pilot resumed own navigation (Radar hand-off, (circle symbol when complete)
13. Radar contact lost ()/Time.
14. Radar contact re-established (R)/Time.
15. Fix designator (e.g., LAU).
16. Fix estimate/actual time over fix.
17. Departure frequency assigned.
18. Additional control data as required.

IFR/Radar Arrivals Nassau



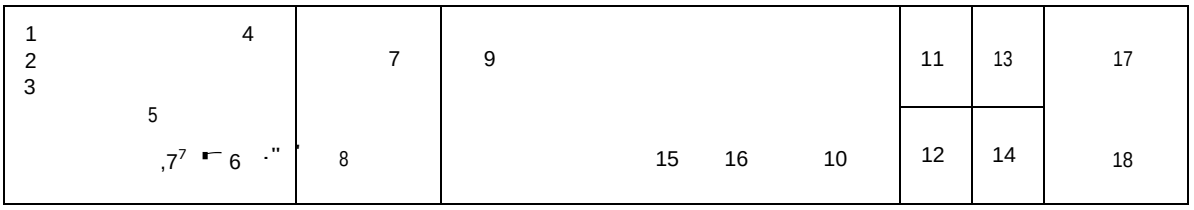
1. Aircraft identification. Prefix identification with company identifier.
2. Type of aircraft. Transponder, DME capability/TAS optional. Prefix type with number of aircraft, when more than one. 'H' for heavy aircraft.
3. Beacon code/ATIS code.
4. Departure point.
5. Inbound route.
6. Clearance Limit, Fix designator.
7. Clearance limit estimate. DOWN arrow (↓) indicating arrival.
8. Destination.
9. Level or altitude information. Control data.
10. Transfer of control point. Time optional.
11. Runway to be used. Indicate intersection when used. (Circle, or tick, when coordination is complete for use of runway other than the runway in use.)
12. Radar contact (R), Radar services terminated Time
    (i). Pilot resumed own navigation 06, Radar hand-off, (circle symbol when complete)
13. Holding fix designator.
14. Time aircraft enters and departs holding fix.
15. Expect Further Clearance Time (EFC).
16. Time clearance issued to depart Holding Fix.
17. Reserved.
18. Indicate symbol 'Z'/Time when aircraft is handed over to local ATC.

VFR/Radar Departures Nassau

<table>
<tr>
<td rowspan="2">1
2
3
4
5
6</td>
<td rowspan="2">7
8</td>
<td rowspan="2">9
15
16
10</td>
<td>11</td>
<td>13</td>
<td rowspan="2">17
18</td>
</tr>
<tr>
<td>12</td>
<td>14</td>
</tr>
</table>

1. Aircraft identification.
2. Type of aircraft. Transponder, DME capability/TAS optional. Prefix type with number of aircraft, when more than one. ‘H’ for heavy aircraft.
3. Beacon code/ATIS code.
4. Departure point.
5. Reserved.
6. Estimated time of departure, optional.
7. ATD. UP arrow (↑), indicating departure.
8. Destination.
9. Level or altitude information, surrounded by a large “V” indicating VFR flight. Control data.
10. Record turn left (LT), right (RT).
11. Runway to be used. Indicate intersection when used. (Circle, or tick, when coordination is complete for use of runway other than the runway in use.)
12. Radar contact (R), Radar services terminated)/Time
13. Radar contact lost/Time.
14. Radar contact re-established (R)/ Time.
15. Reserved.
16. Reserved.
17. Departure frequency assigned.
18. * Additional control data as required.

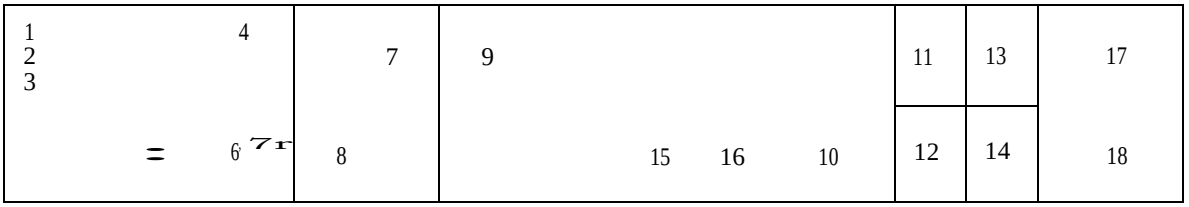
VFR/Radar Arrivals Nassau



1. Aircraftidentification.
2. Typeof aircraft. Transponder, DME capability/TAS optional. Prefix type with number of aircraft, when more than one. 'H' for heavy aircraft..
3. Beaconcode/ATIScode.
4. Departure point.
5. Arrival route. Radial or heading optional.
6. Estimated time of departure.
7. Aerodrome estimate. Down arrow(↓)indicating arrival.
8. Destination.
9. Level or altitude information, surrounded by a large "V" indicating VFR flight. Control data.
10. Reserved.
11. Runway to be used. Indicate intersection when used. (Circle, or tick, when coordination is complete for use of runway other than the runway in use.)
12. Radarcontact established (R), Radarservices terminated (20/Time.
13. Radar contact lost OK/Time.
14. Radarcontactre-established (R) Time.
15. Reserved.
16. Reserved.
17. Reserved.
18. Symbol and Time when aircraftis handedover to the Local ATCO.

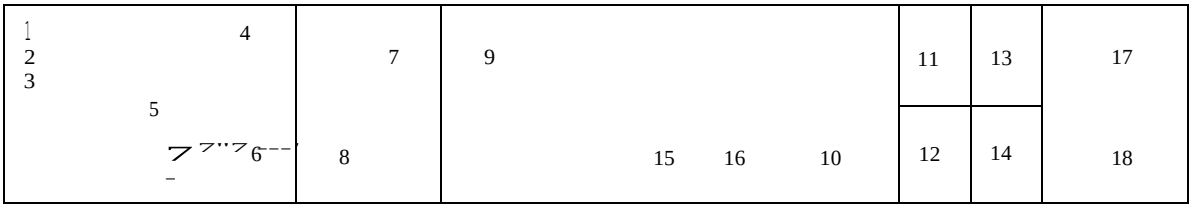
NOTE: In the event of Radarfailure, ATCOs in the TRACON will be required to utilizean abbreviated versionof this strip.

Radar Enroute IFR Departures From Other Than Nassau International



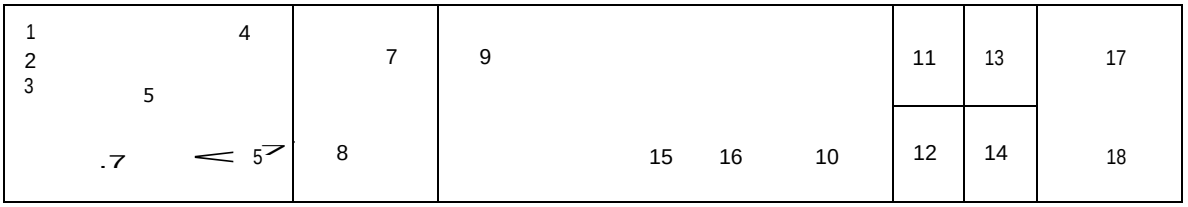
1. Aircraft identification. Prefix identification with company identifier.
2. Type of aircraft. Transponder, DME capability/TAS optional. Prefix type with number of aircraft, when more than one. 'H' for heavy aircraft.
3. Beacon code/ATIS code.
4. Departure point/optional.
5. Initial outbound route (see block 17).
6. Initial Fix designator.
7. Estimate over initial Fix/actual time over initial fix.
8. Destination.
9. Level information/Control Data/ATC clearance.
10. Transfer of control point. Fix, Level and Time.
11. Symbol "R", indicating radar Contact established/Time.
12. Expect further Clearance (EFC), Expect Departure Clearance (EDC) or symbol or abbreviation (1< or VIFNO) indicating clearance void if aircraft not off ground by.
13. Departure point.
14. Departure Time (Four digits).
15. Fix designator (e.g., LAU).
16. Fix estimate.
17. Symbol "V" for enroute flight.
18. Symbol, g indicating Radar Services Terminated/Time... Symbol indicating cancellation/Time.

Radar Enroute IFR Arrivals To Other Than Nassau International



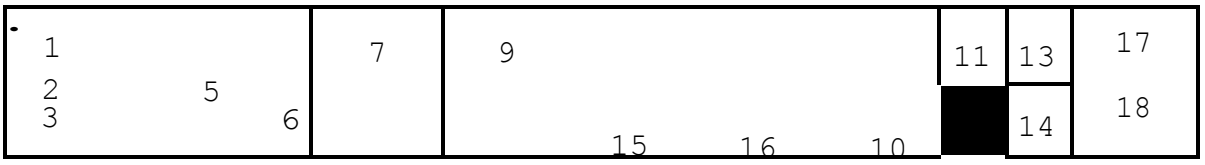
1. Aircraft identification. Prefix identification with company identifier.
2. Type of aircraft. Transponder, DME capability/TAS optional. Prefix type with number of aircraft, when more than one. 'H' for heavy aircraft.
3. Beacon code/ATIS code.
4. Point of departure.
5. Initial inbound route.
6. Clearance limit/Fix/ATA.
7. Estimated time at clearance limit/ATA.
8. Destination (e.g. MTAM, MYER, MYEM, etc.).
9. Level information/Control Data/complete route of flight when appropriate.
10. Transfer of control point (e.g., Fix, Altitude or Time).
11. Indicate by a tick *(')* when coordination, if necessary, is complete.
12. Radar contact established (R), Radar services terminated (R)/Time, (RV) pilot resume down navigation.
13. Second position (Fix) designator.
14. Estimate or Actual Time over second position (Fix).
15. Third position (Fix) designator.
16. Estimate or Actual Time over third position (Fix).
17. Symbol ( ) Radar contact lost.
18. Symbol ' X' indicating Radar Services Terminated/Time.
    Symbol indicating IFR cancellation.

Radar Enroute/Position Reports



1. Aircraft identification. Prefix identification with company identifier.
2. Type of aircraft. Transponder, DME capability/TAS optional. Prefix type with number of aircraft, when more than one. 'H' for heavy aircraft.
3. Beacon code/ATIS code.
4. Reserved.
5. Route of flight.
6. Present position or Fix designator/DTA/ATA.
7. Actual time at present position or Fix.
8. Destination/optional.
9. Level or altitude information/Control Data. Route of flight when required.
10 Transfer of control point: Fix, Level, Time/DTA/ATA.
11. Symbol "R", indicating radar Contact established/Time
    (RV) pilot resumed own navigation, Radar hand-off
    (Circle symbol when hand off complete).
12. Expect further Clearance (EFC).
13. Second Fix designator.
14. Estimate over second fix.
15. Reserved.
16. Reserved.
17. Symbol "V" for enroute flight.
18. Symbol 'X' indicating Radar Services Terminated/Time.
    Symbol indicating cancellation/Time

Procedural Arrival For TFC Within The Nassau Control Area



1. Aircraft identification.
2. Type (to be prefixed by number information is involved) of aircraft and transponder capability/air speed.
3. ATIS Code/Beacon Code where applicable.
4. Departure point.
5. Inbound route.
6. Clearance Limit.
7. ETA @ Clearance Limit.
8. Destination.
9. Control Data, including Level information, holding instructions, EFC or EAC time, type of approach given, etc.
10. Transfer Control Time or Point.
11. Secondary Fix, e.g., Hawke, Melon, Peach or Prune intersections.
12. Actual time over secondary Fix.
13. N/A.
14. Time approach clearance delivered.
15. Time approach control assumed jurisdiction.
16. Actual time aircraft is handed over to Aerodrome ATCO.
17. Missed approach time and instructions issued.
18. Arrival time.

Flight Information
Centre

1.	2.	3.	10	2. '	13.	14.
4.	5.					
6. •	7. 8. 9.					

1. Aircraft identification. Prefix identification with Charter Company identifier.

2. Number of aircraft (if more than one) type of aircraft and suffix indicating any special equipment.

3. True airspeed.

4. Departure point.

5. Route of flight. Estimated time of departure.

6. Destination.

7. Actual Departure time.

8. Estimated Time Arrival.

9. Fuel Endurance or FEXHA. Souls on Board.

10. Symbol for Type of Flight and Altitude.

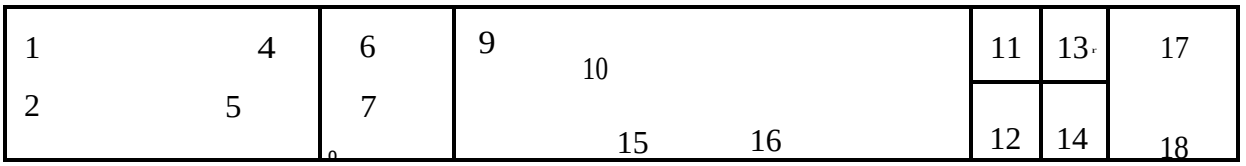
11. Action Time - Actual Time Arrival or Time of Cancellation of Flight Plan.

12. Time of initial contact.

13. Information received from Aircraft. Negative Contact when communications has not been established. - Supplementary information from FIC or other source. Indicate Estimates Time Enroute on Proposed Flight Plan. Pilots name. Citizenship of souls on board. ADIZ information. ADCUS information.

14. Data issued to aircraft including ATC clearance and instructions complete and exact.

FIC/Position Reports



1. Aircraft identification. Prefix identification with Charter Company identifier.
2. Type of aircraft: Transponder, DME capability. TAS optional. Prefix aircraft type with number of aircraft, when more than one.
3. Beacon Code/ATIS.
4. Initial time of contact. (HR MM SS).
5. Route of flight.
6. Present position or fix designator.
7. Actual time at present position or fix.
8. Destination/optional.
9. Level or Altitude information/Control Data. Route of flight when required.
10. Clearance information.
11. Second fix designator.
12. Estimate over second Fix.
13. Third Fix Designator.
14. Estimate over third Fix.
15. Reserved.
16. Reserved.
17. Frequency assignment.
18. Cancellation and Time.

NASSAU Flight Information Centre

<table>
<tr><td rowspan="3">1
2
3</td><td colspan="2" rowspan="3">4
5
6</td><td rowspan="3">7
8</td><td colspan="3" rowspan="3">9
15
16
10</td><td>11</td><td>13</td><td rowspan="2">17</td></tr>
<tr><td rowspan="2">12</td><td rowspan="2">14</td></tr>
<tr><td>18</td></tr>
</table>

Departures from other than Nassau International

1. Aircraft identification. Prefix identification with Charter Company identifier.
2. Aircraft type. Transponder, DME capability/TAS optional. Prefix aircraft type with number of aircraft, when more than one.
3. Beacon Code/ATIS Code.
4. Departure point/optional.
5. Initial outbound route.
6. Proposed time of departure.
7. Actual time of departure.
8. Destination Aerodrome.
9. Level information/Control Data/ATC Clearance.
10. Reserved.
11. Initial Fix designator.
12. Estimate for initial Fix.
13. Reserved.
14. Reserved.
15. Reserved.
16. Reserved.
17. Frequency assignment.
18. Cancellation and Time.

Special VFR Departures

1 4 2 5 3 6	7 8	9 15 16 10			17 18
			12	14	
MD/N39272 ZQA .PN 68/A 02xx	1000 ER	0 E 15NM ZQA M SVFR 1500	[redacted]	R	1200 15
			R	R	

1. Aircraft identification. Prefix identification with charter company identifier.

2. Aircraft type/Transponder, DME capability/TAS optional.

3. Beacon code/ATIS code.

4. Point of Departure.

5. Magnetic bearing/optional.

6. Estimated time of departure/optional

7. Actual time of departure. An up arrow (↑) to indicate a departure.

8. Destination.

9. Control data.

10. Departure frequency.

11. Runway used. Indicate intersection when used. (Circle, or tick, when coordination is complete for use of runway other than runway in use.)

12. Radar Contact (R), Radar Services Terminated (I)/Time.

13. Radar Contact Lost ()/Time.

14. Radar Contact re-established (R)/TIME.

15-16. Additional control data as appropriate.

17. Departure frequency.

18. Transponder code change "SQUAWK 1200"/TIME.

SVFR/Radar Arrivals Nassau.

1 • 2 3	4 5 6	7	9	11 12	13 14	17 18

1. Aircraft identification. Prefix identification with Charter Company identifier.

2. Aircraft type/Transponder, DME capability/TAS optional.

3. Beacon Code/ATIS Code.

4. Point of Departure.

5. Magnetic bearing/optional.

6. Estimated time of departure/optional.

7. Estimated time of arrival. A down (↓) arrow to indicate arrival.

8. Destination.

9 Control data.

10. Departure frequency.

11. Runway used. Indicate intersection when used. (Circle, or tick, when coordination is complete for use of runway other than runway in use.)

12. Radar Contact (R), Radar Services Terminated (g)/Time.

13. Radar Contact lost ()/Time.

14. Radar Contact re-established (R)/Time.

15-16. Additional control data as appropriate.

17. Transponder code change "SQUAWK 1200"/Time.

18. Symbol ‘Z’/Time. Indicating aircraft has been transferred to Local Control.

APPENDIX C. PHRASEOLOGY GUIDE

RADIO COMMUNICATIONS

Use radio frequencies for the special purposes for which they are intended. A single frequency may be used for more than one function.

Monitor interphones and assigned radio frequencies continuously.

PILOT ACKNOWLEDGMENT/READ BACK

1. When issuing clearances or instructions, ensure acknowledgment by the pilot. If no acknowledgment is received, attempt to re-establish contact. If attempts are unsuccessful, advise the Operations Officer.

NOTE−

Pilots may acknowledge clearances, instructions, or other information by using "Wilco," "Roger," "Affirmative," or other words or remarks.

2. If altitude, heading, or other items are read back by the pilot, ensure the read back is correct. If incorrect or incomplete, make corrections as appropriate.

AUTHORIZED INTERRUPTIONS

As necessary, authorize a pilot to interrupt his/her communications guard.

NOTE−

Some users have adopted procedures to ensure uninterrupted receiving capability with ATC when a pilot with only one operative communications radio must interrupt his/her communications guard because of a safety-related problem requiring airborne communications with his/her company. In this event, pilots will request approval to abandon guard on the assigned ATC frequency for a mutually agreeable time period. Additionally, they will inform ATCOs of the NAVAID voice unit and the company frequency they will monitor.

AUTHORIZED TRANSMISSIONS

Transmit only those messages necessary for air traffic control or otherwise contributing to air safety.

FALSE OR DECEPTIVE COMMUNICATIONS

Take action to detect, prevent, and report false, deceptive, or phantom ATCO communications to an aircraft or ATCO. The following must be accomplished when false or deceptive communications occur:

1. Correct false information.

2. Broadcast an alert to aircraft operating on all frequencies within the area where deceptive or phantom transmissions have been received.

3. Collect pertinent information regarding the incident.

4. Notify the operations supervisor of the false, deceptive, or phantom transmission and report all relevant information pertaining to the incident.

AUTHORIZED RELAYS

1. Relay operational information to aircraft or aircraft operators as necessary. Do not agree to handle such messages on a regular basis. Give the source of any such message you relay.

2. Relay official CAD messages as required.

RADIO MESSAGE FORMAT

Use the following format for radio communications with an aircraft:

1. Sector/position on initial radio contact:

a. Identification of aircraft.

b. Identification of ATC unit.

c. Message (if any).

d. The word “over” if required.

2**.** Subsequent radio transmissions from the same sector/position must use the same format, except the identification of the ATC unit may be omitted.

ABBREVIATED TRANSMISSIONS

Transmissions may be abbreviated as follows:

1. Use the identification prefix and the last 3 digits or letters of the aircraft identification after communications have been established. Do not abbreviate similar sounding aircraft identifications or the identification of an air carrier or other civil aircraft having an FAA authorized call sign.

2. Omit the unit identification after communication has been established.

3. Transmit the message immediately after the call up (without waiting for the aircraft's reply) when the message is short and receipt is generally assured.

4. Omit the word "over" if the message obviously requires a reply.

INTERPHONE TRANSMISSION PRIORITIES

Give priority to interphone transmissions as follows:

1. First priority; Emergency messages including essential information on aircraft accidents or suspected accidents. After an actual emergency has passed, give a lower priority to messages relating to that accident.

2. Second priority; Clearances and control instructions.

3. Third priority; Movement and control messages using the following order of preference when possible:

a. Progress reports.

b. Departure or arrival reports.

c. Flight plans.

4. Fourth priority; Movement messages on VFR aircraft.

PRIORITY INTERRUPTION

Use the words "emergency" or "control" for interrupting lower priority messages when you have an emergency or control message to transmit.

INTERPHONE MESSAGE FORMAT

Use the following format for interphone intra/inter-unit communications:

1. Both the caller and receiver identify their unit and/or position in a manner that ensures they will not be confused with another position.

2. Between two facilities which utilize numeric position identification, the caller must identify both unit and position.

3. Caller states the type of coordination to be accomplished when advantageous. For example; handoff or point-out.

4. The caller states the message.

5. The receiver states the response to the caller's message followed by the receiver's operating initials.

6. The caller states his or her operating initials.

7. Identify the interphone voice line on which the call is being made when two or more such lines are collocated at the receiving operating position.

INTERPHONE MESSAGE TERMINATION

Terminate interphone messages with your operating initials.

WORDS AND PHRASES

1. Use the words or phrases in radiotelephone and interphone communication as contained in the P/CG or, within areas where ATCO Pilot Data Link Communications (CPDLC) is in use, the phraseology contained in the applicable CPDLC message set.

2. The word "heavy" must be used as part of the identification of heavy jet aircraft as follows:

EMPHASIS FOR CLARITY

Emphasise appropriate digits, letters, or similar sounding words to aid in distinguishing between similar sounding aircraft identifications. Additionally:

1. Notify each pilot concerned when communicating with aircraft having similar sounding identifications.

2. Notify the operations supervisor-in-charge of any duplicate flight identification numbers or phonetically similar-sounding call signs when the aircraft are operating simultaneously within the same sector.

NOTE-This is especially important when this occurs on a repetitive, rather than an isolated, basis.

ICAO PHONETICS

Use the ICAO pronunciation of numbers and individual letters. (See the ICAO radiotelephony alphabet and pronunciation in TBL C-1.)

TBL C-1
ICAO Phonetics

Character	Word	Pronunciation
0	Zero	ZE−RO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	FOW−ER
5	Five	FIFE
6	Six	SIX
7	Seven	SEV−EN
8	Eight	AIT
9	Nine	NIN−ER
A	Alfa	ALFAH
B	Bravo	BRAHVOH
C	Charlie	CHARLEE
D	Delta	DELLTAH
E	Echo	ECKOH
F	Foxtrot	FOKSTROT
G	Golf	GOLF
H	Hotel	HOHTELL
I	India	INDEE AH
J	Juliett	JEWLEE ETT
K	Kilo	KEYLOH
L	Lima	LEEMAH
M	Mike	MIKE
N	November	NOVEMBER
O	Oscar	OSSCAH
P	Papa	PAHPAH
Q	Quebec	KEHBECK
R	Romeo	ROWME OH
S	Sierra	SEEAIRAH
T	Tango	TANGGO
U	Uniform	YOUNEE FORM
V	Victor	VIKTAH
W	Whiskey	WISSKEY
X	X−ray	ECKSRAY
Y	Yankee	**YAN**GKEY
Z	Zulu	**ZOO**LOO

NOTE−Syllables to be emphasised in pronunciation are in bold face.

NUMBERS USAGE State numbers as follows:

1. Serial numbers. The separate digits. *EXAMPLE−*

Number	Statement
11,495	"One one four niner five."
20,069	"Two zero zero six

2. Altitudes or flight levels:

a. Altitudes. Pronounce each digit in the number of hundreds or thousands followed by the word "hundred" or "thousand" as appropriate.

EXAMPLE−

Number	Statement
10,000	"One zero thousand."
11,000	"One one thousand."
17,900	"One seven thousand niner hundred."

NOTE−
Altitudes may be restated in group form for added clarity if the ATCO chooses.
EXAMPLE−

Number	Statement
10,000	"Ten thousand."
11,000	"Eleven thousand."
17,900	"Seventeen thousand niner hundred."

b. Flight levels. The words "flight level" followed by the separate digits of the flight level.

EXAMPLE−

Flight Level	Statement
180	"Flight level one eight zero."
275	"Flight level two seven five."

c. MDA/DH Altitudes. The separate digits of the MDA/DH altitude.

EXAMPLE−

MDA/DH Altitude	Statement
1,320	"Minimum descent altitude, one three two zero."
486	"Decision height, four eight six."

3. Time:

a. General time information. The four separate digits of the hour and minute/s in terms of UTC.

EXAMPLE−

UTC	Time (12 hour)	Statement
0715	1:15 a.m. CST	"Zero seven one five."
1915	1:15 p.m. CST	"One niner one five."

b. Upon request. The four separate digits of the hours and minute/s in terms of UTC followed by the local standard time equivalent; or the local time equivalent only. Local time may be based on the 24-hour clock system, and the word "local" or the time zone equivalent must be stated when other than UTC is referenced. The term "ZULU" may be used to denote UTC.

EXAMPLE−

UTC	Time (24 hour)	Time (12 hour)	Statement
2230	1430 PST	2:30 p.m.	"Two two three zero, one four three zero Pacific or Local." or "Two−thirty P−M."

c. Time check. The word "time" followed by the four separate digits of the hour and minutes, and nearest quarter minute. Fractions of a quarter minute less than eight seconds are stated as the preceding quarter minute; fractions of a quarter minute of eight seconds or more are stated as succeeding quarter minute.

EXAMPLE−

Time	Statement
1415:06	"Time, one four one five."
1415:10	"Time, one four one five and one−quarter."

d. Abbreviated time. The separate digits of the minutes only.

EXAMPLE−

Time	Statement
1415	"One five."
1420	"Two zero."

4. Field elevation. The words "field elevation" followed by the separate digits of the elevation.

EXAMPLE−

Elevation	Statement
17 feet	"Field elevation, one seven."
817 feet	"Field elevation, eight one seven."
2,817 feet	"Field elevation, two eight one seven."

5. The number "0" as "zero" except where it is used in approved "group form" for authorized aircraft call signs, and in stating altitudes.

EXAMPLE−

As Zero	As Group

"Field elevation one six zero." "Heading three zero zero." "One zero thousand five hundred."	"Western five thirty." "EMAIR One Ten." "Ten thousand five hundred."

6. Altimeter setting. The word "altimeter" followed by the separate digits of the altimeter setting.

EXAMPLE−

Setting	Statement
30.01	"Altimeter, three zero zero one."

7. Separate digits of the indicated wind direction to the nearest 10-degree multiple, the word "at" and the separate digits of the indicated velocity in knots.

EXAMPLE−

"Wind zero three zero at two five."

"Wind two seven zero at one five gusts three five."

8. Heading. The word "heading" followed by the three separate digits of the number of degrees, omitting the word "degrees." Use heading 360 degrees to indicate a north heading.

EXAMPLE−

Heading	Statement
5 degrees	"Heading zero zero five."
30 degrees	"Heading zero three zero."
360 degrees	"Heading three six zero."

9. Radar beacon codes. The separate digits of the 4-digit code.

EXAMPLE−

Code	Statement
1000	"One zero zero zero."
2100	"Two one zero zero."

10. Runways. The word "runway," followed by the separate digits of the runway designation. For a parallel runway, state the word "left," "right," or "centre" if the letter "L," "R," or "C" is included in the designation.

EXAMPLE−

Designation	Statement
3	"Runway Three."
8L	"Runway Eight Left."
27R	"Runway Two Seven Right."

11. Frequencies.

a. The separate digits of the frequency, inserting the word “point” where the decimal point occurs.

i. Omit digits after the second digit to the right of the decimal point.

ii. When the frequency is in the L/MF band, include the word “kilohertz.”

EXAMPLE−

Frequency	Statement
126.55 MHz	“One two six point five five.”
369.0 MHz	“Three six niner point zero.”
121.5 MHz	“One two one point five.”
135.275 MHz	“One three five point two seven.”
302 kHz	“Three zero two kilohertz.”

12. Issue MLS/TACAN frequencies by stating the assigned two- or three-digit channel number.

EXAMPLE−

“M−L−Schannel Five Three Zero.” “TACAN channel Niner Seven.”

l. Speeds.

a. The separate digits of the speed followed by “knots”.

EXAMPLE−

Speed	Statement
250	“Two five zero knots.”
190	“One niner zero knots.”

b. The separate digits of the Mach number preceded by “Mach.”

EXAMPLE−

Mach Number	Statement
1.5	“Mach one point five.”
0.64	“Mach point six four.”
0.7	“Mach point seven.”

c. Miles. The separate digits of the mileage followed by the word “mile.”

NUMBER CLARIFICATION

If deemed necessary for clarity, ATCOs may restate numbers using either group or single-digit form.

EXAMPLE−

"One Seven Thousand, Seventeen Thousand."

"Altimeter Two Niner Niner Two, Twenty Nine Ninety Two."

"One Two Six Point Five Five, One Twenty Six Point Fifty Five."

UNIT IDENTIFICATION

Identify units as follows:

1. Aerodrome traffic control towers. State the name of the unit followed by the word "tower." Where military and civil aerodromes are located in the same general area and have similar names, state the name of the military service followed by the name of the military unit and the word "tower."

2. Functions within a terminal unit. State the name of the unit followed by the name of the function.

3. When calling or replying on an interphone line which connects only two non-VSCS equipped units, you may omit the unit name.

AIRCRAFT IDENTIFICATION

Use the full identification in reply to aircraft with similar sounding identifications. For other aircraft, the same identification may be used in reply that the pilot used in his/her initial call up except use the correct identification after communications have been established. Identify aircraft as follows:

U.S./Bahamas registry aircraft. State the following:

1. Civil. State the prefix "November" when establishing initial communications with U.S. registered aircraft followed by the ICAO phonetic pronunciation of the numbers/letters of the aircraft registration. The ATCO may state the aircraft type, the model, the manufacturer's name, followed by the ICAO phonetic pronunciation of the numbers/letters of the aircraft registration if used by the pilot on the initial or subsequent call.

EXAMPLE−

Air traffic ATCO's initiated call:

"November One Two Three Four Golf." "November One Two Three Four."

Responding to pilot's initial or subsequent call:

"Jet Commander One Two Three Four Papa." "Bonanza One Two Three Four Tango." "Sikorsky Six Three Eight Mike Foxtrot."

NOTE−

If aircraft identification becomes a problem when the procedures specified above are used, the call sign must be restated after the flight number of the aircraft involved.

EXAMPLE−

American Five Twenty−One American."

"Commuter Six Eleven Commuter."

2. Air carrier and other civil aircraft having authorized Bahamas call signs. State the call sign followed by the flight number in group form.

NOTE−

"Group form" is the pronunciation of a series of numbers as the whole number, or pairs of numbers they represent rather than pronouncing each separate digit. The use of group form may, however, be negated by four-digit identifiers or the placement of zeros in the identifier.

EXAMPLE−

"American Fifty-Two."

"Delta One Hundred."

"Eastern Metro One Ten."
"

EXAMPLE−

"United Five One Seven." "United Five Seven Zero."

3. Air taxi and commercial operators not having Bahamas authorized call signs. State the prefix "TANGO" on initial contact, if used by the pilot, followed by the registration number. The prefix may be dropped in subsequent communications.

EXAMPLE−

"Tango Mooney Five Five Five Two Quebec." "Tango November One Two Three Four."

4. Air carrier/taxi ambulance. State the prefix, "Medevac," if used by the pilot, followed by the call sign and flight number in group form.

EXAMPLE−

"Medevac Delta Fifty−One."

5. Civilian air ambulance. State the word "MEDEVAC" followed by the numbers/letters of the registration number.

EXAMPLE−

"Lifeguard Two Six Four Six."

Foreign registry. State one of the following:

1. Civil. State the aircraft type or the manufacturer's name followed by the letters/numbers of the aircraft registration, or state the letters or digits of the aircraft registration or callsign.

EXAMPLE−

"Stationair F−L−R−B." "C−F−L−R−B."

NOTE−

Letters may be spoken individually or phonetically.

2. Air carrier. The abbreviated name of the operating company followed by the letters or digits of the registration or call sign.

EXAMPLE−

"Air France F−L−R−L−G."

2. The flight number in group form or you may use separate digits if that is the format used by the pilot.

EXAMPLE−

“Scandinavian Sixty−eight.” “Scandinavian Six Eight.”

1. Foreign Military. Except for military services identified in FAA Order JO 7340.2, Contractions, the name of the country and the military service followed by the separate digits or letters of the registration or call sign. For military services listed in FAA Order JO 7340.2, the approved telephony followed by the separate digits of the serial number.

EXAMPLE−

“Canforce Five Six Two Seven.”

“Brazilian Air Force Five Three Two Seven Six.”

DESCRIPTION OF AIRCRAFT TYPES

Except for heavy aircraft, describe aircraft as follows when issuing traffic information.

1. Military:

a. Military designator, with numbers spoken in group form; or

b. Service and type; or

c. Type only if no confusion or misidentification is likely.

2. Air Carrier:

a. Manufacturer’s model or designator.

b. Add the manufacturer’s name, company name, or other identifying features when confusion or misidentification is likely.

EXAMPLE−

“L−Ten−Eleven.”

“American MD−Eighty. Seven Thirty−Seven.” “Boeing Seven Fifty−Seven.”

NOTE-Pilots of "interchange" aircraft are expected to inform the tower on the first radio contact the name of the operating company and trip number followed by the company name, as displayed on the aircraft, and the aircraft type.

3. General Aviation (GA) and Air Taxi:

a. Manufacturer's model or designator.

b. Manufacturer's name, or add color when considered advantageous.

EXAMPLE−

"Tri−Pacer."

"P A Twenty−Two."

"Cessna Four−Oh−One." "Blue and white King Air." "Airliner."

"Sikorsky S−Seventy−Six."

4. When issuing traffic information to aircraft following a heavy jet, specify the word "heavy" before the manufacturer's name and model.

EXAMPLE−

"Heavy L−Ten−Eleven."

"Heavy C−Five."

"Heavy Boeing Seven Forty−Seven."

AIRSPACE CLASSES

A, B, C, D, E, F, and G airspace are pronounced in the ICAO phonetics for clarification. The term "Class" may be dropped when referring to airspace in pilot/ATCO communications.

EXAMPLE−

"Cessna 123 Mike Romeo cleared to enter Bravo airspace."

"Sikorsky 123 Tango Sierra cleared to enter New York Bravo airspace."

APPENDIX D GLOSSARY

The following terms have been defined to remove any doubt about the meaning of instructions in the text of the Manual and associated documents. Where a definition in law exists, it is given here.
Suitable interpretations, where they exist, have been selected from national and international documents. Some terms appear in more than one document and sometimes with different meanings.
Terms which have not been annotated are those which have specific meanings within the text and have been defined to avoid ambiguity or misunderstanding. In some cases, they are slight modifications of definitions in other documents.

DEFINITIONS

A

Advisory Airspace: Airspace of defined dimensions, or designated route, within which Air Traffic Advisory Service is available. (ICAO)
Advisory Route: A designated route along which Air Traffic Advisory Service is available. (ICAO)
Aerodrome: Any area of land or water designed, equipped, set apart, or commonly used for affording facilities for the landing and departure of aircraft.
Aerodrome Control Service: Air Traffic Control (ATC) service for aerodrome traffic. (ICAO)
Aerodrome Traffic: All traffic on the maneuvering area of an aerodrome and all aircraft flying in the vicinity of an aerodrome. (ICAO)
Aerodrome Traffic Zone: Airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic. (ICAO)
Aircraft: Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface. (ICAO)

Aircraft Identification: A group of letters, figures, or a combination thereof which is either identical to, or the coded equivalent of, the aircraft call sign to be used in air-ground communications, and which is used to identify the aircraft in ground-ground air traffic services communications. (ICAO)
Air-Ground Communication: Two way communication between aircraft and stations or locations on the surface of the earth. (ICAO)
Air Traffic: All aircraft in flight or operating on the maneuvering area of an aerodrome. (ICAO)

Air Traffic Advisory Service: A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans. (ICAO)

Air Traffic Control Clearance: Authorization for an aircraft to proceed under conditions specified by an Air Traffic Control unit. (ICAO)

Air Traffic Flow Management: A service established with the objective of contributing to a safe, orderly, and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible, and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority. (ICAO)

Air Traffic Service: A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service). (ICAO)

Airway: A control area or portion thereof established in the form of a corridor. (ICAO)

Altitude: The vertical distance of a level, a point, or object considered as a point, measured from mean sea level. (ICAO)

Approach Sequence: The order in which two or more aircraft are cleared to approach to land at the aerodrome. (ICAO)

Approval Request: A request for clearance made by an ARTCC when an aircraft will be entering the controlled or advisory airspace of an adjacent ARTCC in less than 15 minutes, and the first designated reporting point is in the adjacent area.

Approved Departure Time: An allocated take-off time calculated from the elapsed flight time between the aerodrome of departure and the point at which the regulated flow is effective.

Apron: The part of an aerodrome provided for the stationing of aircraft for the embarkation and disembarkation of passengers, for loading and unloading of cargo, and for parking. (ANO)

Arrival Routes: Routes identified in an instrument approach procedure by which aircraft may proceed from the en route phase of flight to an initial approach fix (IAF). (ICAO)

ATS Route: A specified route designed for channeling the flow of traffic as necessary for the provision of air traffic services. (ICAO)

> Note 1: Includes airways, advisory routes, arrival and departure routes, helicopter main routes, link routes, supersonic routes etc.
>
> Note 2: An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements, and as determined by the appropriate ATS Authority, the lowest safe altitude.

ATS Surveillance Service: Term used to indicate a service provided directly by means of an ATS surveillance system. (ICAO)

ATS Surveillance System: A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft. A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR. (ICAO)

B

Base Turn: A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. These tracks are not reciprocal. (ICAO)

C

Contact Point: The position, time, or level at which an arriving aircraft is to establish communication with approach control.

Control Zone: Controlled airspace which has been further notified as a control zone and which extends upwards from the surface.

Coordination: The act of negotiation between 2 or more parties, each vested with the authority to make executive decisions appropriate to the task being discharged.

Cruising Level: A level maintained during a significant portion of a flight. (ICAO)

Current Flight Plan: The flight plan, including changes, if any, brought about by subsequent clearances. (ICAO)

D

Decision Height: In relation to the operation of an aircraft at an aerodrome means the height in a precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established. (ANO)

Declared Capacity: A measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specified portion of airspace in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors which may affect the workload of the controller responsible for the airspace. (ICAO)

E

Elevation: The vertical distance of a point or level on, or affixed to, the surface of the earth measured from mean sea level. (ICAO)

En-Route Operations: Operations conducted on published ATS routes, direct point-to-point operations between defined waypoints, or along great circle routes which are other than take-off, landing, departure, arrival, or terminal operations. [ICAO Doc 9613]. This includes all transit flights outside published ATS routes in receipt of an ATS from either a civil or military ATS provider.

Entry Point: The first airways/advisory airspace reporting point over which a flight passes on entering an FIR. (ICAO)

Exit Point: The last airways/advisory airspace reporting point over which a flight passes before leaving an FIR. (ICAO)

Estimated Time of Arrival: For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome. (ICAO)

F

Final Approach – Instrument: That part of an instrument approach which commences at the specified final approach fix or point, or where such a fix or point is not specified:
1. The end of the last procedure turn, base turn, or inbound turn of a racetrack procedure, if specified, at

Or

2. At the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:
   a. A landing can be made; or
   b. A missed approach procedure is initiated. (ICAO)

Flight Level: A surface of constant atmospheric pressure, which is related to a specific pressure datum, and is separated from other such surfaces by specific pressure intervals. (ICAO)

Flight Path Monitoring: The use of ATS surveillance systems for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path, including deviations from the terms of their ATC clearance. (ICAO)

Flight Plan: Specified information provided to air traffic services units relative to an intended flight or portion of a flight of an aircraft. (ICAO)

G

H

Heading: The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, or compass). (ICAO)

Height: The vertical distance of a level, a point, or an object considered as a point, measured from a specified datum. (ICAO)

Holding Procedure: A predetermined maneuver which keeps an aircraft within a specified airspace whilst awaiting further clearance. (ICAO)

Hot Spot: A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary. (ICAO)

I

Identification: The situation which exists when the position indication of a particular aircraft is seen on a situation display and positively identified. (ICAO)

Initial Approach Segment: That part of an instrument approach procedure between the initial approach fix and the intermediate approach fix (IF) or, where applicable, the final approach fix (FAF) or point. (ICAO)

Instrument Meteorological Conditions: Weather precluding flight in compliance with the Visual Flight Rules. (ANO)

Intermediate Approach – Instrument: That part of an instrument approach procedure between the intermediate approach fix and the final approach fix or point, or between the end of a reversal, racetrack, or dead reckoning track procedure and the final approach fix or point, as appropriate. (ICAO)

Note: In radar approaches, no distinction is made between initial and intermediate approach.

Intermediate Holding Position: A designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower. (ICAO)

J

K

Known Traffic: Traffic, the current flight details and intentions of which are known to the controller concerned through direct communication or co-ordination.

L

Level: A generic term relating to the vertical position of an aircraft in flight and meaning variously height, altitude, or flight level. (ICAO)

M

Maneuvering Area: The part of an aerodrome provided for the take-off and landing of aircraft and for the movement of aircraft on the surface, excluding the apron and any part of the aerodrome provided for the maintenance of aircraft. (ANO)

Minimum Descent Height: In relation to the operation of an aircraft at an aerodrome means the height in a non-precision approach below which descent may not be made without the required visual reference. (ANO)

Minimum Sector Altitude: The lowest safe altitude for instrument flight within sectors of an aid, unit, or aerodrome which is published in the appropriate approach chart.

Missed Approach Point: The point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed. (ICAO)

Missed Approach Procedure: The procedure to be followed if the approach cannot be continued. (ICAO)

N

Non-Precision Approach: An instrument approach using non-visual aids for guidance in azimuth or elevation but which is not a precision approach. (ANO)

O

Obstacle Clearance Height (OCH): The lowest height above the elevation of the relevant runway threshold or above the aerodrome elevation as applicable used in establishing compliance with the appropriate obstacle clearance criteria.

P

Position Indication: The visual indication, in non-symbolic and/or symbolic form, on a situation display, of the position of an aircraft, aerodrome vehicle, or other object. (ICAO)

Position Symbol: The visual indication in symbolic form, on a situation display, of the position of an aircraft, aerodrome vehicle, or other object obtained after automatic processing of positional data derived from any source. (ICAO)

Precision Approach; An instrument approach using an ILS, MLS or Precision Approach Radar for guidance in both azimuth and elevation. (ANO)

Prevailing Visibility: The visibility value that is reached or exceeded within at least half the horizon circle or within at least half of the surface of the aerodrome. These areas could comprise contiguous or non-contiguous sectors.
Primary Surveillance Radar: A surveillance radar system which uses reflected radio signals. (ICAO)
Procedural Control: Term used to indicate that information derived from an ATS surveillance system is not required for the provision of ATC service. (ICAO)
Procedural Separation: The separation used when providing procedural control. (ICAO)
Procedure Turn: A maneuver in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track. (ICAO)

Q

R

Racetrack Procedure: A procedure designed to enable the aircraft to reduce altitude during the initial approach segment and/or establish the aircraft inbound when the entry into a reversal procedure is not practical. (ICAO)
Radar Approach: An approach, in which the final approach phase is executed, under the direction of a controller using radar. (ICAO)
Radar Clutter: The visual indication on a situation display of unwanted signals. (ICAO)
Radar Contact: The situation which exists when the radar position of a particular aircraft is seen and identified on a situation display. (ICAO)
Radar Control: Term used to indicate that radar-derived information is employed directly in the provision of air traffic control service.
Radar Handoff: Transfer of responsibility for the control of an aircraft between two controllers using radar, following identification of the aircraft by both controllers.
Radar Separation: The separation used when aircraft position information is derived from radar sources. (ICAO)
Radar Service: Term used to indicate a service provided directly by means of radar.
Radial: A magnetic bearing extending from a VOR/VORTAC/TACAN.
Release Point: The position, time, or level at which an arriving aircraft comes under the jurisdiction of an approach control unit.
Reporting Point: A specified geographical location in relation to which the position of an aircraft can be reported. (ICAO)
Reversal Procedure: A procedure designed to enable an aircraft to reverse direction during the initial approach segment of an instrument approach procedure. The sequence may include procedure turns or base turns. (ICAO)
Runway: A defined rectangular area on a land aerodrome prepared for the landing and take-off run of aircraft along its length.
Runway-holding Position: A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower. (ICAO)

Runway Incursion: Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft.

S

Significant Point: A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes. (ICAO)
Situation Display: An electronic display depicting the position and movement of aircraft and other information as required. (ICAO)
SSR Response: The visual indication in non-symbolic form, on a situation display, of a response from an SSR transponder in reply to an interrogation. (ICAO)
Standard Instrument Arrival: A designated IFR arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced. (ICAO)
Standard Instrument Departure: A designated IFR departure route linking the aerodrome or specified runway of an aerodrome with a specified significant point, normally on a designated ATS route, at which the en route phase of a flight commences. (ICAO)
Surveillance Radar: Equipment used to determine the position of an aircraft in range and azimuth. (ICAO)

T

Taxiway Holding Position: A designated position at which taxiing aircraft and vehicles may be required to hold in order to provide adequate clearance from a runway or taxiway.
Terminal Control Area (TMA): A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes. (ICAO)
Threshold: The beginning of that portion of the runway useable for landing. (ICAO)
Touchdown: The point of intersection of the glide path with the runway. (ANO)
Track: The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic, or grid). (ICAO)
Traffic Avoidance Advice: Advice provided by an air traffic control unit specifying maneuvers to assist a pilot to avoid a collision. (ICAO)
Transponder: A receiver/transmitter which will generate a reply signal upon interrogation.

U

V

Vectoring: Provision of navigational guidance to aircraft in the form of specific heading, based on the use of an ATS surveillance system. (ICAO)
Visibility: Visibility for aeronautical purposes is the greater of:
1. The greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognized when observed against a bright background;
2. The greatest distance at which lights in the vicinity of 1000 candelas can be seen and identified against an unlit background. (ICAO)

Note: The two distances have different values in air of a given extinction coefficient and the latter b. varies with the background illumination. The former a. is represented by the meteorological optical range

Visual Approach: An approach by an IFR flight when part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to terrain. (ICAO)

Visual Approach (Circling): The visual phase of flight, after completing an instrument approach, to bring the aircraft into position for landing on a runway which is not suitably located for straight-in approach. (ICAO)

Visual Meteorological Conditions (VMC): Weather permitting, flight in accordance with the Visual Flight Rules. (ANO). In the Bahamas VMC is defined as sunrise to sunset, no night VMC.

W

ACRONYMS

ACARS	Aircraft Communication Addressing and Reporting System
ACAS	Airborne Collision Avoidance System
ADR	Advisory Route
ADS-B	Automatic Dependent Surveillance-Broadcast
ADT	Approved Departure Time
AFIS	Aerodrome Flight Information Service
AFTN	Aeronautical Fixed Telecommunications Network
AGCS	Air/Ground Communications Service
AGL	Above Ground Level
AIFSS	Automated International Flight Service Station
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
ALERFA	Alert Phase
AMSL	Above Mean Sea Level
ANO	Air Navigation Order
APV	Approach Procedures with Vertical Guidance
ARTCC	Area Control Centre
ATAS	Air Traffic Advisory Service
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATCU	Air Traffic Control Unit
ATD	Actual Time of Departure
ATFM	Air Traffic Flow Management
ATIS	Automatic Terminal Information Service
ATM	Aerodrome Traffic Monitor
ATS	Air Traffic Service
ATSU	Air Traffic Service Unit
ATZ	Aerodrome Traffic Zone
BASRA	Bahamas Air Sea Rescue Auxiliary
CAD	Civil Aviation Department
CAS	Controlled Air Space
CPDLC	Controller Pilot Data link Communications
c/s	Callsign
CTA	Control Area
CTR	Control Zone
DETRESFA	Distress Phase
DH	Decision Height
DME	Distance Measuring Equipment
DMO	Directives Management Officer
DOC	Designated Operational Coverage
EAT	Expected Approach Time

ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
FAF	Final Approach Fix
FIC	Flight Information Centre
FIR	Flight Information Region
FIS	Flight Information Service(s)
FL	Flight Level
ft	Foot (feet)
GA	General Aviation
GAT	General Air Traffic
GMC	Ground Movement Control
GNSS	Global Navigation Satellite System
GPWS	Ground Proximity Warning System
H/F	High Frequency
HFR	Hold For Release
IAF	Initial Approach Fix
IAP	Instrument Approach Procedure
IAS	Indicated Air Speed
ICAO	International Civil Aviation Organisation
IDENT	Identify
IF	Intermediate Approach Fix
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
INCERFA	Uncertainty Phase
kt	Knots
Lat	Latitude
LC	Local Control
Long	Longitude
LNAV	Lateral Navigation
LVP	Low Visibility Procedure
MAPt	Missed Approach Point
MATS	Manual of Air Traffic Services
MDA	Minimum Descent Altitude
MLS	Microwave Landing System
NAD	Nassau Airport Development Company
NDB	Non-Directional Beacon
NFICC	Nassau Flight Information Centre Coordinator
NOTAM	Notices to Airmen
OCA	Obstacle Clearance Altitude
OCH	Obstacle Clearance Height
OPR	Office of Primary Responsibility
PIREPS	Pilot Reports
PSR	Primary Surveillance Radar

RA	Resolution Advisory
RCC	Rescue Coordination Centre
RNAV	Area Navigation
R of A	Rules of the Air Regulation
RQS	Request Supplementary Flight Plan
RTF	Radiotelephone
RVR	Runway Visual Range
SAR	Search and Rescue
SARPs	Standards and Recommended Practices (ICAO)
SID	Standard Instrument Departure
SMAC	Surveillance Minimum Altitude Chart
SPI	Special Position Identification
SRA	Surveillance Radar Approach
SSR	Secondary Surveillance Radar
STAR	Standard Instrument Arrival
SVFR	Special Visual Flight Rules
TA	Traffic Advisory
RACAN	Tactical Air Navigation
TAS	True Airspeed
TCAS	Traffic Alert and Collision Avoidance System
TMA	Terminal Control Area
TMZ	Transponder Mandatory Zone
TRACON	Terminal Radar Approach Control
USCG	United States Coast Guard
UTC	Coordinated Universal Time
VDF	VHF Direction Finding
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VOR	VHF Omni-directional Range
WS	Watch Supervisor