

AIR TRAFFIC MANAGEMENT PROCEDURES

(ATMP)

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Explanation of Changes

Add/Revise Para.	EXPLANATION
Chapter 10 FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) SERVICES	Add Chapter 10 in accordance with ICAO DOC 4444, 16th edition, amendment 12.
1-2-7 ABBREVIATIONS	Add FF-ICE, GUFI, IAP, PFP and SWIM; delete AIM; textual correction of ATA.
1-3-1 ICAO DEFINITIONS	Add and revise the definitions related to FF-ICE and flight plan in accordance with ICAO DOC 4444, 16th edition, amendment 12; add “Meteorological service provider” in accordance with ICAO DOC 4444, 16th edition, amendment 13.
2-1-10 MINIMUM FUEL	Punctuation correction in accordance with ICAO DOC 4444.
2-1-11 REPORTING ESSENTIAL FLIGHT INFORMATION	Delete reference.
2-6-1 FAMILIARIZATION	Add note on the source of meteorological data.
2-6-8 CHAFF SERVICE	Numbering correction.
3-7-2 TAXI AND GROUND MOVEMENT OPERATIONS	Revise subparagraph h. in accordance with FAA 7110.65BB CHG1 and add reference.
3-10-9 RUNWAY EXITING	Revise example.
4-5-6 LEVEL INFORMATION	Revise example.
4-8-1 APPROACH CLEARANCE	Revise the relevant content and add phraseology and examples in accordance with FAA 7110.65BB CHG1.
4-8-5 CIRCLING APPROACH	Revise note in accordance with FAA 7110.65BB CHG2 and ICAO standards.
4-8-7 MISSED APPROACH	Revise the relevant content in accordance with FAA 7110.65BB CHG1.
4-8-9 PRACTICE INSTRUMENT APPROACHES	Revise the title and the relevant content in accordance with FAA 7110.65BB CHG1.
7-3-4 APPROACHES TO MULTIPLE RUNWAYS	Revise subparagraph b.; textual correction of subparagraph c.3.
7-4-1 AUTHORIZATION	Textual correction.
Entire Document	1. Punctuation after “NOTE” and “REFERENCE” unified as a dash. 2. Spelling, spacing and layout corrections.

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Chapter 1. INTRODUCTION

Section 1. GENERAL

1-1-1 PURPOSE

This manual prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services. Controllers are required to be familiar with the provisions of this manual that pertain to their operational responsibilities and to exercise their best judgment if they encounter situations that are not covered by it.

1-1-2 PUBLICATION

The electronic file of this manual will be published on the Civil Aviation Administration (CAA) official website (Rules and Regulations/ Handbooks and Procedures/ Air Traffic Management Procedures (ATMP). Military related units, air traffic control units, and the interested aviation public could download it from the website.

1-1-3 CANCELLATION

The 19th edition of ATMP, published on November 30, 2025, will be invalidated on November 30, 2026.

1-1-4 EXPLANATION OF MAJOR CHANGES

This manual replaces the 19th edition of ATMP and has been revised mainly based on ICAO Document 4444 and the FAA Order 7110.65 to ensure that flight operations in this region comply with international safety-related policies. If further information is desired, direct questions to the Air Traffic Services Division (ATSD), CAA.

1-1-5 EFFECTIVE DATE

This manual is effective on November 30,2026.

1-1-6 RECOMMENDATIONS FOR PROCEDURAL CHANGES

a. CAA Personnel should submit recommended changes in procedures directly to unit management.

b. Recommendations from other sources should be submitted through appropriate CAA, military, or industry/user channels to ATSD, CAA or AIR FORCE COMMAND HEADQUATERS.

1-1-7 PROCEDURAL LETTERS OF AGREEMENT

Procedures/minima which are applied jointly or otherwise require the cooperation or concurrence of more than one unit/organisation must be documented in a letter of agreement. Letters of agreement only supplement this manual. Any minima they specify must not be less than that specified herein unless appropriate military authority has authorized application of reduced separation between military aircraft.

REFERENCE—

OBJECTIVES OF THE AIR TRAFFIC SERVICES, Para 2-1-1.

1-1-8 CONSTRAINTS GOVERNING SUPPLEMENTS AND PROCEDURAL DEVIATIONS

a. Exceptional or unusual requirements may dictate procedural deviations or supplementary procedures to this manual. Prior to implementing supplemental or any procedural deviation that alters the level, quality,

or degree of service, obtain prior approval from the authority concerned.

b. If military operations or units are involved, prior approval by the appropriate headquarters is required for subsequent interface with CAA.

NOTE—

TERMINAL: *Headquarters Military has delegated to authorize base commanders to reduce same runway separation standards for military aircraft. These are specified and approved by affected ATC and user units. When applied, appropriate advisories may be required; e.g., "(Ident) continue straight ahead on right side; F-16 landing behind on left." (Ident) hold position on right side; F-5 behind on left".*

REFERENCE—

CONTROL OF RUNWAYS-IN-USE, Para 3-1-2.

Section 2. TERMS OF REFERENCE

1-2-1 WORD MEANINGS

As used in this manual:

a. *"Shall" or "must"* or an action verb in the imperative sense, means a procedure is mandatory.

b. "*Shall not" or "must not"* means a procedure is prohibited.

c. "*Should"* means a procedure is recommended.

d. *"May" or "need no"* means a procedure is optional.

e. *"Will"* means futurity, not a requirement for the application of a procedure.

f. Singular words include the plural.

g. Plural words include the singular.

h. *"Aircraft"* means the airframe, crew members or both.

i. *"Approved separation"* means separation in accordance with the applicable minima in this manual.

j. *"Miles"* means nautical miles unless otherwise specified.

k. *Track, bearing, azimuth, heading, and wind direction* information shall always be magnetic unless specifically stated otherwise.

l. *"Time"* when used for ATC operational activities, is the hour and the minute in Coordinated Universal Time (UTC). Change to the next minute is made at the minute plus 30 seconds.

m. *"Runway"* means the runway used by aircraft and, unless otherwise specified, does not include helipads and/or their accompanying takeoff/landing courses. (See Pilot/ Controller Glossary term**s** – Runway and Helipad.)

n. (Not applicable in English version.)

o. *Data block= Track label*

p. *Radar/Video map= System map*

1-2-2 SAME, RECIPROCAL AND CROSSING TRACKS

For the purpose of application of longitudinal separation, the terms *same track*, *reciprocal tracks* and *crossing tracks* shall have the following meanings:

a. **Same tracks:** same direction tracks and intersecting tracks or portions thereof, the angular difference of which is less than 45 degrees or more than 315 degrees, and whose protected airspaces overlap (see FIG 1-2-1)

b. **Reciprocal tracks:** opposite tracks and intersecting tracks or portions thereof, the angular difference which is more than 135 degrees but less than 225 degrees, and whose protected airspaces overlap (see FIG 1-2-2)

c. **Crossing tracks:** intersecting tracks or portions thereof other than those specified in a) and b) above (see FIG 1-2-3).

FIG 1-2-1 Aircraft on same tracks

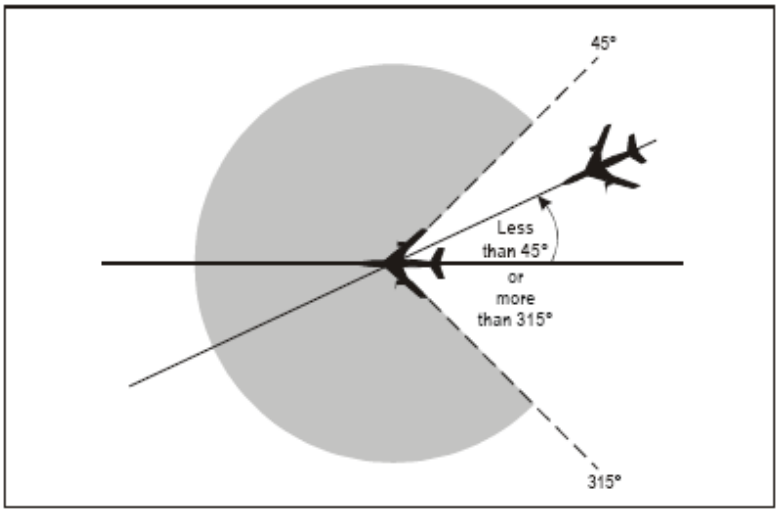


FIG 1-2-2 Aircraft on reciprocal tracks

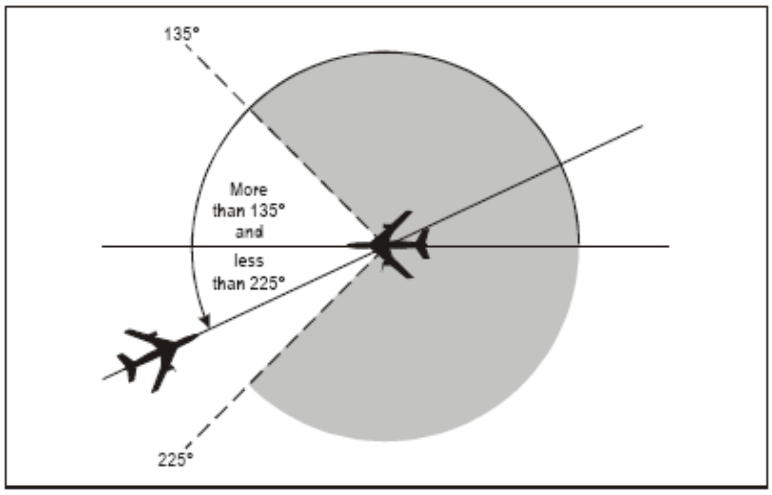
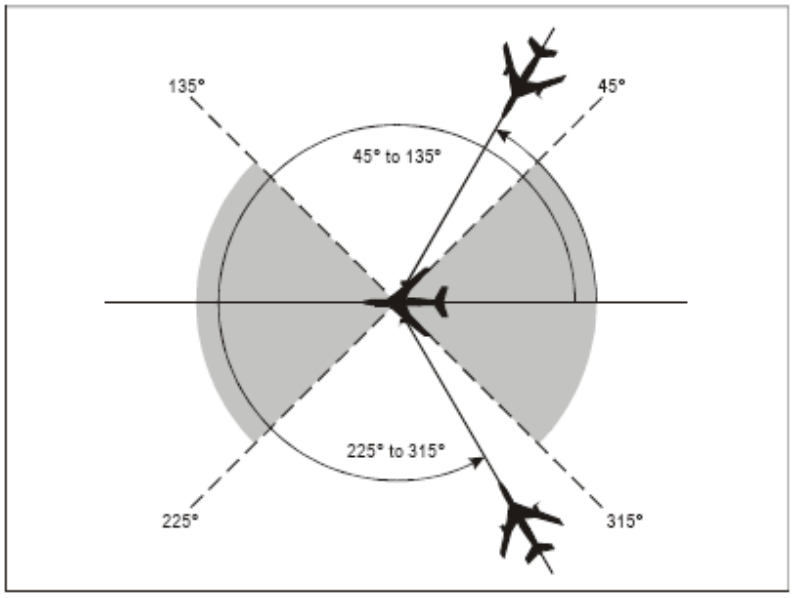


FIG 1-2-3 Aircraft on crossing tracks



1-2-3 NOTES

Statements of fact, or of a prefatory or explanatory nature relating to directive material, are set forth as notes.

1-2-4 REFERENCES

As used in this manual, references direct attention to an additional source of information.

1-2-5 ANNOTATIONS

Revised, reprinted, or new pages are marked as follows:

a. The change number and the effective date are printed on each revised or additional page.

b. A page that does not require a change is reprinted in its original form.

c. Bold vertical lines in the margin of changed pages indicate the location of substantive revisions to the manual. Bold vertical lines adjacent to the title of a chapter, section, or paragraph means that extensive changes have been made to that chapter, section, or paragraph.

d. Paragraphs/sections annotated with ***EN ROUTE*** or ***TERMINAL*** are only to be applied by the designated type unit. When they are not so designated, the paragraphs/sections apply to both types of (en route and terminal) units.

e. The annotation, ***MILITARY***, denotes that the procedure immediately following the annotation applies only to the designated service.

NOTE—
Military procedures shall be applied by:

① *ATC units operated by that military service.*

② *Other ATC units when specified in a letter of agreement.*

f. WAKE TURBULENCE APPLICATION inserted within a paragraph means that the remaining information in the paragraph requires the application of wake turbulence procedures.

g. The annotation PHRASEOLOGY denotes the prescribed words and/or phrases to be used in communications.

NOTE—
Controllers may, after first using the prescribed phraseology for a specific procedure, rephrase the message to ensure the content is understood. Good judgment shall be exercised when using non-standard phraseology.

h. The annotation EXAMPLE provides a sample of the way the prescribed phraseology associated with the preceding paragraph(s) will be used. If the preceding paragraph(s) does (do) not include specific prescribed phraseology, the EXAMPLE merely denotes suggested words and/or phrases that may be used in communications.

NOTE—
The use of the exact text contained in an EXAMPLE not preceded with specific prescribed phraseology is not mandatory. However, the words and/or phrases are expected, to the extent practical, to approximate those use in the example.

1-2-6 PHRASEOLOGY

a. Most phraseologies are not intended to be exhaustive, and when circumstances differ, pilots, ATS personnel and other ground personnel will be expected to use plain language, which should be as clear and concise as possible, in order to avoid possible confusion.

b. Words in parentheses ( ) indicate that specific information, such as a level, a place or a time, etc., must be inserted to complete the phrase, or alternatively that optional phrases may be used. Words in square parentheses [ ] indicate optional additional words or information that may be necessary in specific

instances.

PHRASEOLOGY:

NUMBER ... FOLLOW (aircraft type and position) [additional instructions if required].

CONTINUE APPROACH [PREPARE FOR POSSIBLE GO AROUND]

1-2-7ABBREVIATIONS

As used in this manual, the following abbreviations have the meanings indicated (see TBL 1-2-1)

TBL 1-2-1 ATMP Abbreviations

Abbreviation	***Meaning***
ABM	Abeam
ABN	Aerodrome beacon
AC	Advisory Circular
ACAS	Airborne Collision Avoidance System
ACK	Acknowledgement
ADIZ	Air defense identification zone (to be pronounced "AY-DIZ")
ADS	Automatic Dependent Surveillance
ADS-B	Automatic Dependent Surveillance-Broadcast
A/G	Air-to-Ground
AGL	Above Ground Level
AIDC	ATS Interfacility Data Communications
AIP	Aeronautical Information Publication
AIRMET	Airmen's meteorological information
AISS	Aeronautical Information Services System
ALERFA	Alert Phase code (Alerting Service)
ALS	Approach light system
ALTRV	Altitude reservation
ANWS	Air Navigation and Weather Services
AOC	Air Operation Center
AP	Air police
ARSR	Air route surveillance radar
ASDE	Airport surface detection equipment
ASD	Air Situation Display
ASR	Airport surveillance radar
APMW	Approach Path Monitoring Warning
ATA	Actual time of arrival
ATC	Air traffic control
ATCAA	ATC assigned airspace
ATD	Along Track Distance
ATFM	Air traffic flow management
ATIS	Automatic terminal information service
ATM	Air traffic management
ATMS	Air Traffic Management System
ATMP	Air Traffic Management Procedure
ATPRC	Air Traffic Procedures Revision Committee
ATS	Air Traffic Services
ATSD	Air Traffic Services Division
AWOS	Automated weather observation system
AWS	Aeronautical Weather Station
BO	Base Operations Office
BASE	Cloud base

Abbreviation	*Meaning*
CAA	Civil Aviation Administration
CAF	Chinese Air Force
CAT	Clear air turbulence
CAS	Calibrated Air Speed
CAVOK	Visibility, cloud and present weather better than prescribed values or conditions (to be pronounced "KAV-OH-KAY")
CLAM	Cleared Level Adherence Monitoring
COP	Change over point
CPL	Current Flight Plan
CPDLC	Controller Pilot Data Link Communication
CRL	Current Reported Level
CTA	Control Area
DAIW	Danger Area Infringement Warning
DETRESFA	Distress Phase code (Alerting Service)
DF	Direction finder
DH	Decision height
DME	Distance measuring equipment compatible with TACAN
DR	Dead Reckoning
DUPE	Duplicate SSR Code
EDCT	Expect departure clearance time
EFC	Expect further clearance
ELBA	Emergency location beacon-aircraft
ELT	Emergency locator transmitter
ETA	Estimated time of arrival
ETO	Estimate Time Over
FAA	Federal Aviation Administration (USA)
FAF	Final Approach Fix
FANS	Future Air navigation System
FDEP	Flight data entry and printout
FDIO	Flight data input/output
FDP	Flight Data Processing
FDR	Flight Data Record
FF	Flight Following
FF-ICE	Flight and Flow — Information for a Collaborative Environment
FIC	Flight Information Center
FIR	Flight Information Region
FIS	Flight Information Station
FL	Flight Level
FMS	Flight Management System
FNA	Final Approach
FOD	Foreign Object Damage
FPCW	Flight Plan Conflict Warning
FPL	Filed flight plan (message type designator)
GBAS	Ground-Based Augmentation Stations (to be pronounced “GEE-BAS”)
GCA	Ground controlled approach
GNSS	Global Navigation Satellite System
GP	Glide path
GPS	Global Positioning System
GUFI	Globally Unique Flight Identifier
HIRL	High intensity runway lights
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organization

Abbreviation	*Meaning*
IDENT	Aircraft identification
IFR	Instrument flight rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
INCERFA	Uncertainty Phase code (Alerting Service)
INREQ	Information request
INS	Inertial Navigation System
LLWS	Low Level Wind Shear
LLWAS	Low level wind shear alert system
L/MF	Low/medium frequency
LOA	Letter of Agreement
LORAN	Long-range Navigation System
MACH	Mach Number
MALS	Medium intensity approach light system
MALSR	Medium approach light system with runway alignment indicator lights
MAP	Missed approach point
MCA	Minimum crossing altitude
MCI	Mode-C intruder
MDA	Minimum descent altitude
MEA	Minimum en route (IFR) altitude
METAR	Aerodrome routine meteorological report (in meteorological code)
MIA	Minimum IFR altitude
MIRL	Medium intensity runway lights
MOA	Military operations area
MOCA	Minimum obstruction clearance altitude
MPR	Missed Position Report
MRA	Minimum reception altitude
MRTS	Multi-Radar Tracking System
MSAW	Minimum Safe Altitude Warning
MSL	Mean sea level
MSTS	Multi Sensor Tracking System
MTCD	Mid-term Conflict Detection
MTI	Moving target indicator
MVA	Minimum vectoring altitude
NDB	Nondirectional radio beacon
NM	Nautical Mile
NOTAM	Notice to Airmen
NRCC	National Rescue Coordination Center
NTZ	No transgression zone
OCA	Obstacle Clearance Altitude
PAPI	Precision Approach Path Indicator
PAR	Precision approach radar
PDC	Pre-Departure Clearance
PFP	Preliminary Flight Plan
PIREP	Pilot report
POB	Persons on board
RAIL	Runway alignment indicator lights
RAIM	Receiver Autonomous Integrity Monitoring
RAIW	RVSM Airspace Infringement Warning
RAM	Route Adherence Monitoring
RBP	Radar ByPass Processing
RCLS	Runway centerline system

Abbreviation	*Meaning*
REDL	Runway edge light(s)
REF	Reference to...or refer to...
REIL	Runway end identifier lights
RFL	Requested Flight Level
RL	Report leaving
RNAV	Area Navigation
RNP	Required Navigation Performance
RTQC	Real Time Quality Control
RVR	Runway visual range
RVSM	Reduced Vertical Separation Minima
SAP	Segregated Airspace Probe
SAR	Search and rescue
SBAS	Satellite Based Augmentation System (to be pronounced “ESS-BAS”)
SC	System Coordinator
SELCAL	Selective calling system
SFA	Single frequency approach
SFO	Simulated flameout
SID	Standard instrument departure
SIGMET	Significant meteorological information
SMR	Surface Movement Radar
SNMAP	Safety Nets and Monitoring Aids Processing
SPECI	Aerodrome special meteorological report (in meteorological code)
SPECIAL	Local special meteorological report (in abbreviated plain language)
SST	Super Sonic Transport
STAR	Standard instrument arrival
STCA	Short Term Conflict Alert
STOL	Short takeoff and landing
SVFR	Special Visual Flight Rules
SWIM	System-Wide Information Management
TAA	Terminal arrival altitude
TACAN	TACAN-UHF navigation aid (omnidirectional course and distance information)
TACC	Taipei Area Control Center
TCAS	Traffic Alert and Collision Avoidance System
TDZL	Touchdown zone light system
TMA	Terminal control area
TODA	Take-off distance available
TOHAP	Terrain and obstacle hazard and airspace protection
TORA	Take-off run available
TRACON	Terminal radar approach control
UHF	Ultra high frequency
UTC	Coordinated Universal Time.
VASI	Visual Approach Slope Indicator System
VCSS	Voice Communications Switching System
VFR	Visual flight rules
VHF	Very high frequency
VLF	Very low frequency
VMC	Visual Meteorological Conditions
VOR	VHF navigational aid (omnidirectional course information)
VOR/DME	Collocated VOR and DME navigation aids (VHF course and UHF distance information)
VORTAC	Collocated VOR and TACAN navigation aids (VHF and UHF course and distance information)
VTOL	Vertical Takeoff and Landing

Abbreviation	***Meaning***
WAM	Wide Area Multilateration
WSO	Weather Service Office
WSP	Weather Systems Processor

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Section 3. DEFINITIONS

1-3-1 ICAO DEFINITIONS

The following definitions are from ICAO PANS-ATM, Doc 4444.

***Note*—**

① Throughout the text of this document the term "service" is used as an abstract noun to designate functions, or service rendered; the term "unit" is used to designate a collective body performing a service.

② All references to "Radio Regulations" are to the Radio Regulations published by the International Telecommunication Union (ITU). Radio regulations are amended from time to time by the decisions embodied in the Final Acts of World Radiocommunication Conferences held normally every two to three years. Further information on the ITU processes as they relate to aeronautical radio system frequency use is contained in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of approved ICAO policies *(Doc 9718).*

When the following terms are used in the present document they have the following meanings:

Accepting unit/controller: Air traffic control unit/air traffic controller next to take control of an aircraft.

***Note*—** *See definition of "transferring unit/controller".*

ADS agreement: An ADS reporting plan which establishes the conditions of ADS data reporting (i.e. data required by the air traffic services unit and frequency of ADS reports which have to be agreed to prior to the provision of the ADS services).

***Note*—** *The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.*

ADS contract: A means by which the terms of an ADS agreement will be exchanged between the ground system and the aircraft, specifying under what conditions ADS reports would be initiated, and what data would be contained in the reports.

***Note*—** *The term "ADS contract" is a generic term meaning variously, ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode. Ground forwarding of ADS reports may be implemented between ground systems.*

ADS service: A service using aircraft information provided by means of automatic dependent surveillance.

Advisory airspace: An airspace of defined dimensions, or designated route, within which air traffic advisory service is available.

Advisory route: A designated routine along which air traffic advisory service is available.

***Note*—** *Air traffic control service provides a much more complete service than air traffic advisory service; advisory areas and routines are therefore not established within controlled airspace, but air traffic advisory service may be provided below and above control areas.*

Aerodrome: A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

***Note*—** *The term "aerodrome" where used in the provisions relating to flight plans and ATS messages is intended to cover also sites other than aerodromes which may be used by certain types of aircraft, e.g. helicopters or balloons.*

Aerodrome control service: Air traffic control service for aerodrome traffic.

Aerodrome control tower: A unit established to provide air traffic control service to aerodrome traffic.

Aerodrome elevation: The elevation of the highest point of the landing area.

Aerodrome traffic: All traffic on the maneuvering area of an aerodrome and all aircraft flying in the vicinity

of an aerodrome.

Note— *An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.*

Aerodrome traffic circuit: The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

Aeronautical fixed services (AFS): A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

Aeronautical fixed station: A station in the aeronautical fixed service.

Aeronautical ground light: Any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

Aeronautical Information Publication (AIP): A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

Aeronautical mobile service: A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies.

Aeronautical station: A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

Aeronautical telecommunication station: A station in the aeronautical telecommunication service.

Airborne collision avoidance system (ACAS): An aircraft system based on secondary surveillance radar (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.

Aircraft: Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of air against the earth's surface.

Aircraft address: A unique combination of 24 bits available for assignment to an aircraft for the purpose of air-ground communications, navigation and surveillance.

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.

Aircraft observation: The evaluation of one or more meteorological elements made from an aircraft in flight.

Aircraft proximity: A situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. An aircraft proximity is classified as follows:

Risk of collision: The risk classification of an aircraft proximity in which serious risk of collision has existed.

Safety not assured: The risk classification of an aircraft proximity in which the safety of the aircraft may have been compromised.

No risk of collision: The risk classification of an aircraft proximity in which no risk of collision has existed.

Risk not determined: The risk classification of an aircraft proximity in which insufficient information was available to determine the risk involved, or inconclusive or conflicting evidence precluded such determination.

Air-ground communication: Two-way communication between aircraft and stations or locations on the surface of the earth.

AIRMET information: Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for low-level flights in the flight

information region concerned or sub-area thereof..

AIRPROX: The code word used in an air traffic incident report to designate aircraft proximity.

Air-report: A report from an aircraft in flight prepared in conformity with requirements for position, and operational and/or meteorological reporting.

Air-taxiing: Movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than 37 km/h (20 kt).

Note— *The actual height may vary, and some helicopters may require air-taxiing above 8m (25 ft) AGL to reduce ground effect turbulence or provide clearance for cargo sling loads.*

Air-to-ground communications: One way communication from aircraft to stations or locations on the surface of the earth.

Air traffic: All aircraft in flight or operating on the maneuvering area of an aerodrome.

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.

Air traffic control clearance: Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

Note—

① For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance" when used in appropriate contexts.

② The abbreviated term "clearance" may be prefixed by the words "taxi", "take-off", "departure", "en-route", "approach" or "landing" to indicated the particular portion of flight to which the air traffic control clearance relates.

Air traffic control instruction: Directives issued by air traffic control for the purpose of requiring a pilot to take a specific action.

Air traffic control service: A service provided for the purpose of:

a) Preventing collisions:

   1) Between aircraft, and

   2) On the maneuvering area between aircraft and obstructions

b) Expediting and maintaining an orderly flow of air traffic.

Air traffic control unit: A generic term meaning variously, area control centre, approach control unit or aerodrome control tower.

Air traffic flow management (ATFM): 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.

Air traffic management (ATM): The dynamic, integrated management of air traffic and airspace including air traffic services, airspace management and air traffic flow management - safely, economically and efficiently - through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

Air traffic service (ATS): 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).

Air traffic services airspaces: Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

Note— *ATS airspaces are classified as Class A to G as shown in Annex 11, Appendix 4.*

Air traffic services reporting office: A unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure.

Note— *An air traffic services reporting office may be established as a separate unit or combined with an existing unit, such as another air traffic services unit, or a unit of the aeronautical information service.*

Air traffic services unit: A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

Airway: A control area or portion thereof established in the form of a corridor.

ALERFA: The codeword used to designate an alert phase.

Alerting service: A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

Alert phase: A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

Allocation, allocate: Distribution of frequencies, SSR Codes, etc. to a State, unit or service. Distribution of 24-bit aircraft addresses to a State or common mark registering authority.

Alphanumeric characters (alphanumerics): A collective term of letters and figures (digits).

Alternate aerodrome: An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed or to land at the aerodrome of intended landing. Alternate aerodromes include the following:

Take-off alternate: An alternate aerodrome at which an aircraft can land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-route alternate: An aerodrome at which an aircraft would be able to land after experiencing an abnormal or emergency condition while en route.

Destination alternate: An alternate aerodrome to which an aircraft may proceed should it become either impossible or inadvisable to land at the aerodrome of intended landing.

Note— *The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.*

Altitude: The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

Approach control service: Air traffic control service for arriving or departing controlled flights.

Approach control unit: A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

Approach sequence: The order in which two or more aircraft are cleared to approach to land at the aerodrome.

Appropriate ATS authority: The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

Appropriate authority:

a) Regarding flight over the high seas: The relevant authority of the State of Registry.

b) Regarding flight other than over the high seas: The relevant authority of the State having sovereignty over the territory being overflown.

Apron: A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

Area control centre (ACC): A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

Area control service: Air traffic control service for controlled flights in control areas.

Area navigation (RNAV): A method of navigation which permits aircraft operation on any desired flight

path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Area navigation route: An ATS route established for the use of aircraft capable of employing area navigation.

Assignment, assign: Distribution of frequencies to stations. Distribution of SSR Codes or 24-bit aircraft addresses to aircraft.

ATIS: The symbol used to designate automatic terminal information service.

ATS route: A specified route designated for channeling the flow of traffic as necessary for the provision of air traffic services.

***Note*—**

① The term "ATS route" is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

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.

Automatic dependent surveillance (ADS): A surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position-fixing systems, including aircraft identification, four-dimensional position and additional data as appropriate.

Automatic terminal information service (ATIS): The automatic provision of current, route information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

Data link-automatic terminal information service (D-ATIS): The provision of ATIS via data link.

Voice-automatic terminal information service (Voice-ATIS): The provision of ATIS by means of continuous and repetitive voice broadcasts.

Base turn: A turn expected by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal.

***Note*—** *Base turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.*

Blind transmission: A transmission from one station to another station in circumstances where two-way communication cannot be established but where it is believed that the called station is able to receive the transmission.

Broadcast: A transmission of information relating to air navigation that is not addressed to a specific station or stations.

Ceiling: The height above the ground or water of the base of the lowest layer of cloud below 6,000m (20,000ft) covering more than half the sky.

Clearance limit: The point to which an aircraft is granted an air traffic control clearance.

Code (SSR): The number assigned to a particular multiple pulse reply signal transmitted by a transponder in Mode A or Mode C.

Computer: A device which performs sequences of arithmetical and logical steps upon data without human intervention.

***Note*—** *When the word "computer" is used in this document it may denote a computer complex, which includes one or more computers and peripheral equipment.*

Control area: A controlled airspace extending upwards from a specified limit above the earth.

Controlled aerodrome: An aerodrome at which air traffic control service is provided to aerodrome traffic.

***Note*—** *The term "controlled aerodrome" indicates that air traffic control service is provided to aerodrome traffic but does not necessarily imply that a control zone exists.*

Controlled airspace: An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.

Note— *Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D and E as described in Annex 11, 2.6.*

Controlled flight: Any flight which is subject to an air traffic control clearance.

Controller-pilot data link communications (CPDLC): A means of communication between controller and pilot, using data link for ATC communications.

Control zone: A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

Cruise climb: An aeroplane cruising technique resulting in a net increase in altitude as the aeroplane mass decreases.

Cruising level: A level maintained during a significant portion of a flight.

Current data authority: The designated ground system through which a CPDLC dialogue between a pilot and a controller currently responsible for the flight is permitted to take place.

Current flight plan (CPL): The flight plan that reflects changes to the filed flight plan, if any, by subsequent ATC clearances.

Data convention: An agreed set of rules governing the manner or sequence in which a set of data may be combined into a meaningful communication.

Data link initiation capability (DLIC): A data link application that provides the ability to exchange addresses, names and version numbers necessary to initiate data link applications.

Data processing: A systematic sequence of operations performed on data.

Note— *Examples of operations are the merging, sorting, computing or any other transformation or rearrangement with the object of extracting or revising information, or of altering the representation of information.*

Decision altitude (DA) or decision height (DH): A specified altitude or height in the precision approach or approach with vertical guidance at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note—

① Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.

② The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.

③ For convenience where both expressions are used they may be written in the form "decision altitude/height" and abbreviated "DA/H".

Dependent parallel approaches: Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are prescribed.

DETRESFA: The code word used to designate a distress phase.

Discrete code: A four-digit SSR Code with the last two digits not being "00".

Distress phase: A situation wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

Downstream data authority: A designated ground system, different from the current data authority through which the pilot can contact an appropriate ATC unit for the purposes of receiving a downstream clearance.

eFPL: The symbol used to designate a filed flight plan exchanged using FF-ICE services.

Elevation: The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.

Emergency phase: A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.

Estimated elapsed time: The elapsed time required to proceed from one significant point to another.

Estimated off-block time: The estimated time at which the aircraft will commence movement associated with departure.

Estimated time of arrival: For IFR flights, the time at which it is estimated that the aircraft will arrive over the 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.

Expected approach time: The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding fix to complete its approach for a landing.

Note— *The actual time of leaving the holding fix will depend upon the approach clearance.*

Final approach: That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified.

a) At the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or

b) 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:

1) A landing can be made, or

2) A missed approach procedure is initiated.

Flight and flow — information for a collaborative environment (FF-ICE): Information necessary for planning, coordination, and notification of flights, exchanged in a standardized format between members of the ATM community, including those involved in flight operations and aerodrome operations.

Flight and flow — information for a collaborative environment (FF-ICE) services: A set of services established for the purposes of facilitating the exchange of FF-ICE, accurate assessment of demands, appropriate resource planning, and optimizing flight planning and execution.

Flight and flow — information for a collaborative environment (FF-ICE) services unit: A unit designated by the appropriate ATS authority for the provision of FF-ICE services.

Note— The appropriate ATS authority may designate an existing unit, such as an air traffic services unit, or a local or regional air traffic flow management unit as an FF-ICE services unit.

Flight crew member: A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Flight information centre: A unit established to provide flight information service and alerting service.

Flight information region (FIR): An airspace of defined dimensions within which flight information service and alerting service are provided.

Flight information service: A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

Flight level: A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

Note—

① A pressure type altimeter calibrated in accordance with Standard Atmosphere:

a) When set to a QNH altimeter setting, will indicate altitude

b) When set to QFE altimeter setting, will indicate height above the QFE reference datum

c) When set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.

② The terms "height" and "altitude", used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

Flight plan: Specified information relative to an intended flight or portion of a flight of an aircraft.

Note—

① The term flight plan may be prefixed by the words "preliminary", "filed", "current" or "operational" to indicate the context and different stages of a flight.

② When the word "message" is used as a suffix to this term, it denotes the content and format of the flight plan data as transmitted.

Flight visibility: The visibility forward from the cockpit of an aircraft in flight.

Flow control: Measures designed to adjust the flow of traffic into a given airspace, along a given route, or bound for a given aerodrome, so as to ensure the most effective utilization of the airspace.

Forecast: A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.

FPL: The symbol used to designate a filed flight plan exchanged via aeronautical fixed service (AFS).

Glide path: A descent profile determined for vertical guidance during a final approach.

Globally unique flight identifier (GUFI): An unchangeable data element associated with a flight that allows all eligible members of the ATM community to unambiguously refer to information pertaining to the flight.

Ground effect: A condition of improved performance (lift) due to the interference of the surface with the airflow pattern of the rotor system when a helicopter or other VTOL aircraft is operating near the ground.

Note— *Rotor efficiency is increased by ground effect to a height of about one rotor diameter for most helicopters.*

Ground visibility: The visibility at an aerodrome, as reported by an accredited observer or by automatic systems.

Heading: The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid).

Height: The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

Holding fix: A geographical location that services as a reference for a holding procedure.

Holding procedure: A predetermined maneuver which keeps an aircraft within a specified airspace while awaiting further clearance.

Human Factors principles: Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

Human performance: Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

IFR: The symbol used to designate the instrument flight rules.

IFR flight: A flight conducted in accordance with the instrument flight rules.

IMC: The symbol used to designate instrument meteorological conditions.

INCERFA: The code word used to designate an uncertainty phase.

Incident: An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Note— *The type of incidents which are of main interest to the International Civil Aviation Organization for accident prevention studies are listed in the* ICAO Accident/Incident Reporting Manual *(Doc 9156)*.

Independent parallel approaches: Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are not prescribed.

Independent parallel departures: Simultaneous departures from parallel or near-parallel instrument runways.

Initial approach segment: That segment of an instrument approach procedure between the initial approach fix and intermediate approach fix or, where applicable, the final approach fix or point.

Instrument approach procedure (IAP): A series of predetermined maneuvers by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

Non-precision approach (NPA) procedure: An instrument approach procedure which utilizes lateral guidance but does not utilize vertical guidance.

Approach procedure with vertical guidance (APV): An instrument procedure which utilizes lateral and vertical guidance but does not meet the requirements established for precision approach and landing operations.

Precision approach (PA) procedure: An instrument approach procedure using precision lateral and vertical guidance with minima as determined by the category of operation:

Note— *Lateral and vertical guidance refers to the guidance provided either by:*

a) A ground-based navigation aid, or

b) Computer-generated navigation data.

Instrument meteorological conditions (IMC): Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

Note—

① The specified minima for visual meteorological conditions are contained in Chapter 3 of Annex 2.

② In a control zone, a VFR flight may proceed under instrument meteorological conditions if and as authorized by air traffic control.

Landing area: That part of a movement area intended for the landing or take-off aircraft.

Level: A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

Location indicator: A four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station.

Maneuvering area: That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Meteorological information: Meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

Meteorological office: An office designated to provide meteorological service for international air navigation.

Meteorological report: A statement of observed meteorological conditions related to a specified time and location.

Meteorological service provider: The relevant entity designated to provide meteorological service for international air navigation on behalf of a Contracting State.

Minimum fuel: The term used to describe a situation in which an aircraft's fuel supply has reached a state

where little or no delay can be accepted.

Note — *This is not an emergency situation but merely indicates that an emergency situation is possible, should any undue delay occur.*

Missed approach procedure: The procedure to be followed if the approach cannot be continued.

Mode (SSR): The conventional identifier related to specific functions of the interrogation signals transmitted by an SSR interrogator. There are four modes specified in Annex 10: A, C, S and intermode.

Movement area: That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the maneuvering area and the apron(s).

Multilateration (MLAT) system: A group of equipment configured to provide position derived from the secondary surveillance radar (SSR) transponder signals (replies or squitters) primarily using time difference of arrival (TDOA) techniques. Additional information, including identification, can be extracted from the received signals.

Near-parallel runways: Non-intersecting runways whose extended centre lines have an angle of convergence/divergence of 15 degrees or less.

Next data authority: The ground system so designated by the current data authority through which an onward transfer of communications and control can take place.

Non-radar separation: The separation used when aircraft position information is derived from sources other than radar.

Normal operating zone (NOZ): Airspace of defined dimensions extending to either side of an ILS localizer course. Only the inner half of the normal operating zone is taken into account in independent parallel approaches.

NOTAM: A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

No transgression zone (NTZ): In the context of independent parallel approaches, a corridor of airspace of defined dimensions located centrally between the two extended runway centre lines, where a penetration by an aircraft requires a controller intervention to maneuver any threatened aircraft on the adjacent approach.

Obstacle clearance altitude (OCA) or obstacle clearance height (OCH): The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note —

① Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 2m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.

② For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

Operational control: The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

Operator: A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Performance-based navigation (PBN): Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note — *Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.*

Pilot-in-command: The pilot designated by the operator, or in the case of general aviation, the owner, as

being in command and charged with the safe conduct of a flight.

Precision approach radar (PAR): Primary radar equipment used to determine the position of an aircraft during final approach, in terms of lateral and vertical deviations relative to a nominal approach path, and in range relative to touchdown.

***Note*—** *Precision approach radars are designated to enable pilots of aircraft to be given guidance by radio communication during the final stages of the approach to land.*

Preliminary flight plan (PFP): The information related to a flight submitted by an operator or a designated representative to conduct collaborative planning of a flight, prior to filing a flight plan.

Pressure-altitude: An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.

Primary radar: A radar system which uses reflected radio signals.

Primary surveillance radar (PSR): A surveillance radar system which uses reflected radio signals.

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.

***Note*—**

① Procedure turns are designated "left" or "right" according to the direction of the initial turn.

② Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.

Profile: The orthogonal projection of a flight path or portion thereof on the vertical surface containing the nominal track.

PSR blip: The visual indication, in non-symbolic form, on a radar display of the position of an aircraft obtained by primary radar.

Radar: A radio detection device which provides information on range, azimuth and/or elevation of objects.

Radar approach: An approach in which the final approach phase is executed under the direction of a radar controller.

Radar clutter: The visual indication on a radar display of unwanted signals.

Radar contact: The situation which exists when the radar position of a particular aircraft is seen and identified on a radar display.

Radar control: Term used to indicate that radar-derived information is employed directly in the provision of air traffic control service.

Radar controller: A qualified air traffic controller holding a radar rating appropriate to the functions to which he is assigned.

Radar display: An electronic display of radar-derived information depicting the position and movement of aircraft.

Radar identification: The situation which exists when the radar position of a particular aircraft is seen on a radar display and positively identified by the air traffic controller.

Radar map: Information superimposed on a radar display to provide ready indication of selected features.

Radar monitoring: The use of radar 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 air traffic control clearances.

Radar position indication (RPI): The visual indication, in symbolic form, on a radar display, of the position of an aircraft obtained after automatic processing of positional data derived from primary and/or secondary surveillance radar.

Radar position symbol (RPS). The visual indication, in symbolic form, on a radar display, of the position of an aircraft obtained after automatic processing of positional data derived from primary and/or secondary surveillance radar.

Radar separation: The separation used when aircraft position information is derived from radar sources.

Radar service: Term used to indicate a service provided directly by means of radar.

Radar track position: An extrapolation of aircraft position by the computer based upon radar information and used by the computer for tracking purposes.

Note — *In some cases, information other than radar-derived information is used to assist the tracking processes.*

Radar unit: That element of an air traffic services unit which uses radar equipment to provide one or more services.

Radar vectoring: Provision of navigational guidance to aircraft in the form of specific headings, based on the use of radar.

Receiving unit/controller: Air traffic services unit/air traffic controller to which a message is sent.

Note — *See definition of "sending unit/controller".*

Repetitive flight plan (RPL): A flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units.

Reporting point: A specified geographical location in relation to which the position of an aircraft can be reported.

Required navigation performance (RNP): A statement of the navigation performance necessary for operation within a defined airspace.

Note — *Navigation performance and requirements are defined for a particular RNP type and/or application.*

Rescue coordination centre: A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.

Rescue unit: A unit composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue.

RNP type: A containment value expressed as a distance in nautical miles from the intended position within which flights would be for at least 95 per cent of the total flying time.

Example: *RNP 4 represents a navigation accuracy of plus or minus 7.4 km (4 NM) on a 95 per cent containment basis.*

Runway: A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Runway-holding position: A designated position intended to protect a runway, an obstacle limitation surface, or an ILS sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.

Note — *In radiotelephony phraseologies, the expression "holding point" is used to designate the runway-holding position.*

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 aircraft.

Runway visual range (RVR): The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings of the lights delineating the runway or identifying its centre line.

Secondary radar: A radar system wherein a radio signal transmitted from the radar station initiates the transmission of a radio signal from another station.

Secondary surveillance radar (SSR): A surveillance radar system which uses transmitters/receivers

(interrogators) and transponders.

Segregated parallel operations: on parallel or near-parallel instrument runways in which one runway is used exclusively for approaches and the other runway is used exclusively for departures.

Sending unit/controller: Air traffic services unit/air traffic controller transmitting a message.

***Note*—** *See definition of "receiving unit/controller".*

Shoreline: A line following the general contour of the shore, except that in cases of inlets or bays less than 30 nautical miles in width, the line shall pass directly across the inlet or bay to intersect the general contour on the opposite side.

SIGMET information: Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations.

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.

Special VFR flight: A VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

SSR response: The visual indication, in non-symbolic form, on a radar display, of a response from an SSR transponder in reply to an interrogation.

Standard instrument arrival (STAR): A designated instrument flight rule (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.

Standard instrument departure (SID): A designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en-route phase of a flight commences.

Stopway: A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

Surveillance radar: Radar equipment used to determine the position of an aircraft in range and azimuth.

Taxiing: Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

Taxiway: A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

a) *Aircraft stand taxilane:* A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.

b) *Apron taxiway:* A portion of a taxiway system located on an apron and intended to provide a through taxi route across the apron.

c) *Rapid exit taxiway:* A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

Terminal control area (TMA): A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

Threshold: The beginning of that portion of the runway usable for landing.

Total estimated elapsed time: For IFR flights, the estimated time required from take-off to 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 destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from take-off to arrive over the destination aerodrome.

Touchdown: The point where the nominal glide path intercepts the runway.

Note — *"Touchdown" as defined above is only a datum and it is not necessarily the actual point at which the aircraft will touch the runway.*

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).

Traffic avoidance advice: Advice by an air traffic services unit specifying maneuvers to assist a pilot to avoid a collision.

Traffic information: Information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.

Transfer of control point: A defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next.

Transferring unit/controller: Air traffic control unit/air traffic controller in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit/air traffic controller along the route of flight.

Note — *See definition of "accepting unit/controller".*

Transition altitude: The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.

Transition layer: The airspace between the transition altitude and the transition level.

Transition level. The lowest flight level available for use above the transition altitude.

Uncertainty phase: A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

Unmanned free balloon: A non-power-driven, unmanned, lighter-than-air aircraft in free flight.

Note — *Unmanned free balloons are classified as heavy, medium or light in accordance with specifications contained in Annex 2, Appendix 4.*

VFR: The symbol used to designate the visual flight rules.

VFR flight: A flight conducted in accordance with the visual flight rules.

Visibility: Visibility for aeronautical purposes is the greater of:

a) 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.

b) The greatest distance at which lights in the vicinity of 1,000 candelas can be seen and identified against an unlit background.

Note —

① 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 (MOR).

② The definition applies to the observations of visibility in local route and special reports, to the observations of prevailing and minimum visibility reported in METAR and SPECI and to the observations of ground visibility.

Visual approach: An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain.

Visual meteorological conditions: Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

Note— *The specified minima are contained in Annex 2, Chapter 4.*

VMC: The symbol used to designate visual meteorological conditions.

Waypoint: A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

Fly-by waypoint: A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure, or

Flyover waypoint: A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.

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Chapter 2. GENERAL CONTROL

Section 1. GENERAL

2-1-1 OBJECTIVES OF THE AIR TRAFFIC SERVICES

The objectives of the air traffic services are to:

a. Prevent collisions between aircraft.

b. Prevent collisions between aircraft on the maneuvering area and obstructions on that area.

c. Expedite and maintain an orderly flow of air traffic.

d. Provide advice and information useful for the safe and efficient conduct of flights.

e. Notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organisations as required.

f. Air Traffic Control services are not provided to any drone operating below 400ft AGL.

NOTE—

If drone operating is within the prohibited area, restricted area or at a certain distance from the boundary of an aerodrome or airfield, ATC shall clear the aircraft in accordance with para 8-3-2, Separation Minima.

REFERENCE—

ICAO DEFINITIONS, Para 1-3-1.

2-1-2 DUTY PRIORITIES

a. Give priority to the provision of air traffic control service over the provision of flight information service whenever the provision of air traffic control service so requires.

b. The provision of safety alerts is a function of the air traffic control service.

REFERENCE—

SAFETY ALERT, Para 2-1-8

2-1-3 GENERAL PROVISIONS OF SEPARATION

a. Unless otherwise specified, vertical or horizontal separation shall be provided:

1. Between all flights in Class A airspaces
2. Between IFR flights in Class C, D, E and E surface airspaces
3. Between IFR flights and VFR flights in Class C airspace
4. Between IFR flights and special VFR flights, and
5. Between special VFR flights, when so prescribed by the appropriate ATS authority.

Except for the cases under 2. above in airspace Classes D, E and E surface, during the hours of daylight, when flights have been cleared to climb or descend subject to maintaining own separation and remaining in visual meteorological conditions.

REFERENCE—

MAINTAIN VMC ON IFR FLIGHT PLAN. Para 7-1-3

b. No clearance shall be given to execute any manoeuvre that would reduce the spacing between two aircraft to less than the separation minimum applicable in the circumstances.

c. Larger separations than the specified minima should be applied whenever exceptional circumstances such as unlawful interference or navigational difficulties call for extra precautions. This should be done with due regard to all relevant factors so as to avoid impeding the flow of air traffic by the application of excessive separations.

d. Where the type of separation or minimum used to separate two aircraft cannot be maintained, another type of separation or another minimum shall be established prior to the time when the current separation minimum would be infringed.

e. The objectives of the air traffic control service in para 2-1-1 do not include prevention of collision with terrain. The procedures prescribed in this document do not relieve pilots of their responsibility to ensure that any clearances issued by air traffic control units are safe in this respect. When vectoring an IFR flight and when giving an IFR flight a direct routing which takes the aircraft off an ATS route, the radar controller shall issue clearances such that the prescribed obstacle clearance will exist at all times until the aircraft reaches the point where the pilot will resume own navigation.

2-1-4 PROCEDURAL PREFERENCE

a. Use automation procedures in preference to non-automation procedures when workload, communications, and equipment capabilities permit.

b. Use radar separation in preference to nonradar separation when it will be to an operational advantage and workload, communications, and equipment permit.

c. Use nonradar separation in preference to radar separation when the situation dictates that an operational advantage will be gained.

NOTE—

One situation may be where vertical separation would preclude excessive vectoring.

2-1-5 GENERAL PRIORITIES

Provide air traffic control service to aircraft on a “first come, first served” basis as circumstances permit, except the following:

NOTE—

It is solely the pilot’s prerogative to cancel an IFR flight plan. However, a pilot's retention of an IFR flight plan does not afford priority over VFR aircraft. For example, this does not preclude the requirement for the pilot of an arriving IFR aircraft to adjust his flight path, as necessary, to enter a traffic circuit in sequence with arriving VFR aircraft.

a. An aircraft already at a level has priority over an aircraft requesting that level.

b. When two or more aircraft are at the same level, the preceding aircraft has priority.

c. Within an RVSM level band, an RVSM approved aircraft has priority for level assignment over a non-RVSM approved aircraft.

d. Assign levels at a holding fix or visual holding point to facilitate clearing each aircraft to approach in its proper priority. Normally, the first aircraft to arrive over a holding fix or visual holding location should be at the lowest level, with following aircraft at successively higher levels.

e. When extended holding is anticipated, turbojet aircraft permitted to hold at higher levels to conserve fuel retain their place in the approach sequence.

f. In establishing approach and departure sequences, facilitate the movement of the maximum number of aircraft with the least average delay.

g. A landing aircraft has priority over a departing aircraft if the latter cannot take-off with the prescribed separation minima.

h. Aircraft landing and taking-off have priority over taxiing aircraft.

2-1-6 SPECIFIC PRIORITIES

Provided that safety is not jeopardized, assign priority for the use of airspace and the maneuvering area in the following order:

a. An aircraft that is believed to be in a state of emergency, including being subject to unlawful interference.

b. An aircraft which anticipates being compelled to land because of factors affecting the safe operation of the aircraft (engine failure, shortage of fuel, etc).

c. Air ambulance (MEDEVAC) aircraft; when verbally requested, military evacuation flights; when requested by the pilot, ground handling of patients, vital organs and urgently needed medical supplies.

d. Aircraft engaged in search and rescue operations.

e. Armed forces combat mission aircraft.

f. Presidential aircraft and entourage, and any escort, support aircraft.

NOTE—

Presidential aircraft and entourage include aircraft and entourage of the President, Vice President, or other public figures when designated by the military authority.

g. Other military mission flights by pre-arrangement.

h. Flight Check aircraft.

i. All other aircraft, except that IFR have priority over special VFR.

2-1-7 EXPEDITIOUS COMPLIANCE

a. Use the word “immediately” only when expeditious compliance is required to avoid an imminent situation.

b. Use the word “expedite” only when prompt compliance is required to avoid the development of an imminent situation. If an “expedite” climb or descent clearance is issued by ATC, and subsequently the level to maintain is changed or restated without an expedite instruction, the expedite instruction is cancelled.

c. In either case, if time permits, include the reason for this action.

2-1-8 SAFETY ALERT

Issue a safety alert to an aircraft if you are aware the aircraft is in a position/level which, in your judgment, places it in unsafe proximity to terrain, obstructions, or other aircraft. The issuance of safety alert is a first priority duty. Once the pilot informs you action is being taken to resolve the situation, you may discontinue the issuance of further alerts. Do not assume that because someone else has responsibility for the aircraft that the unsafe situation has been observed and the safety alert issued; inform the appropriate controller.

NOTE—

① *Conditions, such as workload, traffic volume, the quality/limitations of the radar system, and the available lead time to react are factors in determining whether it is reasonable for the controller to observe and recognize such situations. While a controller cannot see immediately the development of every situation where a safety alert must be issued, the controller must remain vigilant for such situations and issue a safety alert when the situation is recognized.*

② *Recognition of situations of unsafe proximity may result from MSAW, automatic level readouts, Conflict/Mode C Intruder Alert, observations on a PAR scope, or pilot reports.*

③ *Once the alert is issued, it is solely the pilot's prerogative to determine what course of action, if any, will be taken.*

a. Terrain/Obstruction Alert- Immediately issue/initiate an alert to an aircraft if you are aware the aircraft is at a level which, in your judgment, places it in unsafe proximity to terrain/obstructions. Issue the alert as follows:

PHRASEOLOGY:

(Identification) LOW LEVEL ALERT, CHECK YOUR LEVEL IMMEDIATELY.

THE, as appropriate, MEA/MVA/MOCA/MIA IN YOUR AREA IS (level),

or if an aircraft is past the final approach fix,

and, if known, issue

THE, as appropriate, OCA/MDA/DA IS (level).

b. Aircraft Conflict/Mode C Intruder Alert- Immediately issue/initiate an alert to an aircraft if you are aware of another aircraft at a level which you believe places them in unsafe proximity. If feasible, offer the pilot an alternate course of action. When an alternate course of action is given, end the transmission with the word "immediately."

PHRASEOLOGY—

(Identification) TRAFFIC ALERT (position of traffic if time permits),

ADVISE YOU TURN LEFT/RIGHT (specific heading, if appropriate

and/or

CLIMB/DESCEND (specific level if appropriate) IMMEDIATELY.

EXAMPLE:

"EVA Eight Five Seven, Traffic Alert, 12'o clock, 1 mile, advise you turn left immediately."

Or

"EVA Eight Five Seven, Traffic Alert, 12'o clock, 1 mile, advise you turn left and climb immediately."

REFERENCE—

TERRAIN AWARENESS WARNING SYSTEM (TAWS) ALERTS, Para 2-1-29

Traffic Information, Para 2-1-22

LEVEL FILTERS, Para 5-2-17

2-1-9 IN-FLIGHT EQUIPMENT MALFUNCTIONS

a. When a pilot reports an in-flight equipment malfunction, determine the nature and extent of any special handling desired.

NOTE—

In-flight equipment malfunctions include partial or complete failure of equipment which may affect either safety and/or the ability of the flight to proceed under IFR in the ATC system. Controllers may expect reports from pilots regarding VOR, TACAN, ADF, GNSS, or low frequency navigation receivers, impairment of air-ground communications capability, or other equipment deemed appropriate by the pilot (e.g. airborne weather radar). Pilots should communicate the nature and extent of any assistance desired from ATC.

b. Provide the maximum assistance possible consistent with equipment, workload, and any special handling requested.

c. Relay to other controllers or units who will subsequently handle the aircraft, all pertinent details concerning the aircraft and any special handling required or being provided.

2-1-10 MINIMUM FUEL

If an aircraft declares a state of "minimum fuel," inform any unit to whom control jurisdiction is transferred of the minimum fuel problem and be alert for any occurrence which might delay the aircraft en route.

NOTE—

Use of the term "minimum fuel" indicates recognition by a pilot that his fuel supply has reached a state where, upon reaching destination, he cannot accept any undue delay. This is not an emergency situation but merely an advisory that

indicates an emergency situation is possible should any undue delay occur. A minimum fuel advisory does not imply a need for traffic priority. Common sense and good judgment will determine the extent of assistance to be given in minimum fuel situations. If, at any time, the remaining usable fuel supply suggests the need for traffic priority to ensure a safe landing, the pilot should declare an emergency and report fuel remaining in minutes.

PHRASEOLOGY–

a) MINIMUM FUEL

b) ROGER [NO DELAY EXPECTED or EXPECT (delay information)]

2-1-11 REPORTING ESSENTIAL FLIGHT INFORMATION

Report as soon as possible to the appropriate FIC/FIS, aerodrome authority, TACC, approach control unit, operations office, or military operations office any flight conditions which may have an adverse effect on air safety, including information on any radioactive material or toxic chemical clouds, for transmission to aircraft likely to be affected.

NOTE—

ATSD/FIC are responsible for classifying and disseminating Notices to Airmen.

REFERENCE—

TIMELY INFORMATION, Para 3-3-3.

2-1-12 NAVAID MALFUNCTIONS

a. When an aircraft reports a NAVAID malfunction, take the following actions:

   1. Request a report from a second aircraft.
   2. If the second aircraft reports normal operations, continue use and inform the first aircraft. Record the incident on appropriate form.
   3. If the second aircraft confirms the malfunction or in the absence of a second aircraft report, activate the standby equipment or request the monitor unit to activate.
   4. If normal operation is reported after the standby equipment is activated, continue use, record the incident on appropriate form, and notify maintenance personnel.
   5. If continued malfunction is reported after the standby equipment is activated or the standby equipment cannot be activated, inform maintenance personnel and request advice on whether or not the aid should be shut down. In the absence of a second aircraft report, advise the maintenance personnel of the time of the initial aircraft report and the estimated time a second aircraft report could be obtained.

b. When an aircraft reports a GNSS anomaly, request the following information and/or take the following actions:

   1. Record the following minimum information:

      (a) Aircraft call sign and type.

      (b) Location.

      (c) Level.

      (d) Date/time of occurrence.

   2. Broadcast the anomaly report to other aircraft as necessary.

      PHRASEOLOGY:

      ATTENTION ALL AIRCRAFT, GNSS REPORTED UNRELIABLE or GNSS MAY NOT BE AVAILABLE [DUE TO INTERFERENCE];
      1) IN THE VICINITY OF (location) (radius) [BETWEEN (levels)];

or
2) IN THE AREA OF (description) (or IN (name) FIR) [BETWEEN (levels)].
ATTENTION ALL AIRCRAFT, BASIC GNSS or SBAS, or GBAS UNAVAILABLE FOR (specify operation) [FROM (time) TO (time) or UNTIL FURTHER NOTICE]

EXAMPLE:

"Attention all aircraft, GNSS reported unreliable in the area 30 miles south of Anbu VOR."

2-1-13 MESSAGES CONCERNING THE OPERATION OF AERONAUTICAL FACILITIES

Messages concerning the operation of aeronautical facilities shall be transmitted to aircraft from whose flight plan it is apparent that the operation of the flight may be affected by the operating status of the operating facility concerned. Messages shall contain appropriate data on the service status of the facility in question. If information concerning the status of aeronautical facilities has been issued in the NOTAM or broadcasted on the ATIS, controllers need not provide the information verbally.

2-1-14 FORMATION FLIGHTS

Control formation flights as a single aircraft. When individual control is requested, issue advisory information which will assist the pilots in attaining separation. When pilot reports indicate separation has been established, issue control instructions as required.

NOTE—

① Separation responsibility between aircraft within the formation during transition to individual control rests with the pilots concerned until approved separation has been attained.

② Formation join-up and breakaway will be conducted in VFR weather conditions unless prior authorization has been obtained from ATC or individual control has been approved.

REFERENCE—

ADDITIONAL SEPARATION FOR FORMATION FLIGHTS, Para 5-5-8.

2-1-15 COORDINATE USE OF AIRSPACE

a. Ensure that the necessary coordination has been accomplished before you allow an aircraft under your control to enter another controller's area of jurisdiction.

b. Before you issue control instructions directly or relay through another source to an aircraft which is within another controller's area of jurisdiction that will change that aircraft's heading, route, speed, or level, 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:

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

   2. The controller receiving the transfer of control.

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

c. If you issue control instructions to an aircraft through a source other than another controller (e.g., another pilot) ensure that the necessary coordination has been accomplished with any controllers listed in subpara b.1., 2. and 3., whose area of jurisdiction is affected by those instructions unless otherwise specified by a LOA or a unit directive.

REFERENCE—

CONTROL TRANSFER, Para 2-1-16.

ADJACENT AIRSPACE, Para 5-5-9.

TRANSFERRING CONTROLLER HANDOFF, Para 5-4-5.

ACCEPTING CONTROLLER HANDOFF, Para 5-4-6.

2-1-16 CONTROL TRANSFER

a. Transfer control of an aircraft in accordance with the following conditions:

   1. At a prescribed or coordinated location, time, fix, or level; or,

   2. At the time a radar handoff and frequency change to the accepting controller have been completed and when authorized by a unit directive or LOA which specifies the type and extent of control that is transferred.

REFERENCE—

COORDINATE USE OF AIRSPACE, Para 2-1-15.

TRANSFERRING CONTROLLER HANDOFF, Para 5-4-5.

ACCEPTING CONTROLLER HANDOFF, Para 5-4-6.

b. Transfer control of an aircraft only after eliminating any potential conflict with other aircraft for which you have separation responsibility.

c. Assume control of an aircraft only after it is in your area of jurisdiction unless specifically coordinated or as specified by LOA or a unit directive.

2-1-17 SURFACE AIRSPACE

a. Coordinate with the appropriate control tower on an individual aircraft basis before issuing a clearance which would require flight within a surface airspace for which the tower has responsibility unless otherwise specified in a LOA.

b. Coordinate with the appropriate control tower for transit authorization when you are providing radar traffic information to an aircraft that will enter another unit's airspace.

   NOTE—
   The pilot is not expected to obtain his/her own authorization through each area when in contact with a radar unit.

c. Transfer communications to the appropriate unit, if required, prior to operation within a surface airspace for which the tower has responsibility.

REFERENCE—

RADIO COMMUNICATIONS TRANSFER, Para 2-1-18.

SURFACE AIRSPACE RESTRICTIONS, Para 3-1-12.

APPLICATION, Para 7-6-1.

2-1-18 RADIO COMMUNICATIONS TRANSFER

a. Transfer radio communications before an aircraft enters the accepting controller's area of jurisdiction unless otherwise coordinated or specified by a LOA or a unit directive.

b. Transfer radio communications by specifying the following:

NOTE—

Radio communications transfer procedures may be specified by a LOA.

   1. The unit name or location name and terminal function to be contacted. ***TERMINAL:*** Omit the location name when transferring communications to another controller within your unit, or when the tower and approach control share the same name (for example, Taipei Tower and Taipei Approach). EXCEPTION. Controllers must include the name of the unit when instructing an aircraft to change frequency for final approach guidance.

   2. Frequency to use except the following may be omitted:

      (a) Departure frequency if previously given or published on a SID chart for the procedure issued.

(b) ***TERMINAL:*** Ground or local control frequency if in your opinion the pilot knows which frequency is in use.

EXAMPLES:

"Contact Tower."

"Contact Ground."

"Contact Ground, One Two Zero Decimal Eight."

"Contact Taipei Radio."

"Contact Departure."

"Contact Taipei Control, One Two Six Decimal Seven."

3. Time, fix, level, or specifically when to contact a unit. You may omit this when compliance is expected upon receipt.

NOTE—
Pilots are expected to maintain a listening watch on the transferring controller's frequency until the time, fix, or level specified.

PHRASEOLOGY:

CONTACT (unit name or location name and terminal function), (frequency).

If required,

AT (time, fix, or level).

c. Controllers must, within a reasonable amount of time, take appropriate action to establish/restore communications with all aircraft for which a communications transfer or initial contact to his/her sector is expected/required.

NOTE—

For the purposes of this paragraph, a reasonable amount of time is considered to be 5 minutes from the time the aircraft enters the controller's area of jurisdiction or comes within range of radio/communications coverage. Communications include two-way VHF or UHF radio contact, data link, or high frequency (HF) radio.

d. In situations where an operational advantage will be gained, and following coordination with the accepting controller, you may instruct aircraft on the ground to monitor the accepting controller's frequency.

EXAMPLES:

"Monitor Tower."

"Monitor Ground."

"Monitor Ground, One Two Zero Decimal Eight."

e. In situations where a sector has multiple frequencies or when sectors are combined using multiple frequencies and the aircraft will remain under your jurisdiction, transfer radio communication by specifying the following:

PHRASEOLOGY:

(Identification) CHANGE TO MY FREQUENCY (state frequency).

EXAMPLE:

"United Two Two Two, change to my frequency One Two Three Decimal Four."

f. Avoid issuing a frequency change to helicopters known to be single-piloted during air-taxiing, air-transiting, or low-level flight. Whenever possible, relay necessary control instructions until the pilot is able to change frequency.

NOTE—

Most light helicopters are flown by one pilot and require the constant use of both hands and feet to maintain control. Although Flight Control Friction Devices assist the pilot, changing frequency near the ground could result in inadvertent ground contact and consequent loss of control. Pilots are expected to advise ATC of their single-pilot status if unable to comply with a frequency change.

g. In situations where the controller does not want the pilot to change frequency but the pilot is expecting or may want a frequency change, use the following phraseology:

PHRASEOLOGY:

REMAIN THIS FREQUENCY.

REFERENCE—

CLEARANCE INFORMATION, Para 4-7-1.

COMMUNICATION TRANSFER, Para 5-12-8.

2-1-19 OPERATIONAL REQUESTS

Respond to a request from another controller, a pilot or vehicle operator by one of the following verbal means:

a. Restate the request in complete or abbreviated terms followed by the word "APPROVED." The phraseology "APPROVED AS REQUESTED" may be substituted in lieu of a lengthy read back.

PHRASEOLOGY:

(Requested operation) APPROVED.

or

APPROVED AS REQUESTED.

b. State restrictions followed by the word "APPROVED."

PHRASEOLOGY:

(Restriction and/or additional instructions, requested operation) APPROVED.

c. State the word "UNABLE" and, time permitting, a reason.

PHRASEOLOGY:

UNABLE (requested operation)

and when necessary,

(reason and/or additional instructions.)

d. State the words "STAND BY."

NOTE—
"STAND BY" is not an approval or denial. The controller acknowledges the request and will respond at a later time.

REFERENCE—

TRAFFIC INFORMATION, Para 2-1-22.

ROUTE OR LEVEL AMENDMENTS, Para 4-2-4.

2-1-20 WAKE TURBULENCE

a. Except as provided for in 2-1-20 e., wake turbulence separation minima shall be based on a grouping of aircraft types into four categories according to the maximum certificated take-off mass as follows:

1. SUPER (J) — aircraft types specified as such in ICAO Doc 8643, Aircraft Type Designators;
2. HEAVY (H) — all aircraft types of 136,000 kg or more, with the exception of aircraft types listed in ICAO Doc 8643 in the SUPER (J) category;

3. MEDIUM (M) — aircraft types less than 136,000 kg but more than 7,000 kg; and
4. LIGHT (L) — aircraft types of 7,000 kg or less.

b. Apply wake turbulence procedures to an aircraft operating behind another aircraft when wake turbulence separation is required.

NOTE—

① The wake turbulence category for each aircraft type is contained in ICAO Doc 8643, Aircraft Type Designators.

② Para 5-5-4, Minima and Para 5-5-7, Passing or Diverging specify the required radar wake turbulence separations. Time-based separations are contained in Para 3-9-7, Same Runway Separation, Para 3-9-8, Wake Turbulence Separation for Intersection Departures, Para 3-9-9, Intersecting Runway /Intersecting flight path separation, Para 6-1-4, Arrival Minima, and Para 6-7-5, Interval Minima.

c. The separation minima shall continue to touchdown for all IFR aircraft not making a visual approach or maintaining visual separation.

d. Wake turbulence separation need not be applied:

1. For arriving VFR flights landing on the same runway as a preceding landing SUPER, HEAVY or MEDIUM aircraft; and
2. Between arriving IFR flights executing visual approach when the aircraft has reported the preceding aircraft in sight and has been instructed to follow and maintain own separation from that aircraft.

e. When approved by the appropriate ATS authority, wake turbulence separation minima may be applied utilizing wake turbulence groups and shall be based on wake generation and resistance characteristics of the aircraft. These depend primarily on maximum certificated take-off mass, wing characteristics and speeds; the group designators are described as follows:

1. GROUP A — aircraft types of 136,000 kg or more, and a wing span less than or equal to 80 m but greater than 74.68 m;
2. GROUP B — aircraft types of 136,000 kg or more, and a wing span less than or equal to 74.68 m but greater than 53.34 m;
3. GROUP C — aircraft types of 136,000 kg or more, and a wing span less than or equal to 53.34 m but greater than 38.1 m;
4. GROUP D — aircraft types less than 136,000 kg but more than 18,600 kg, and a wing span greater than 32 m;
5. GROUP E — aircraft types less than 136,000 kg but more than 18,600 kg, and a wing span less than or equal to 32 m but greater than 27.43 m;
6. GROUP F — aircraft types less than 136,000 kg but more than 18,600 kg, and a wing span less than or equal to 27.43 m;
7. GROUP G — aircraft types of 18,600 kg or less (without wing span criterion).

NOTE—

① Information on the wake turbulence group for each aircraft type is contained in ICAO Doc 8643 Aircraft Type Designators.

② Guidance on the implementation of wake turbulence separation between wake turbulence groups can be found in the Manual on Implementation of Wake Turbulence Separation Minima (ICAO Doc 10122).

③ Wake turbulence Group A is equivalent to the SUPER wake turbulence category, and Groups B and C are equivalent to the HEAVY category.

2-1-21 WAKE TURBULENCE CAUTION

a. Aerodrome controllers shall, when applicable, apply the wake turbulence separation minima whenever the responsibility for wake turbulence avoidance rests with the pilot-in-command, aerodrome controllers

shall, to the extent practicable, advise aircraft of the expected occurrence of hazards caused by turbulent wake.

NOTE—
Occurrence of turbulent wake hazards cannot be accurately predicted and aerodrome controllers cannot assume responsibility for the issuance of advice on such hazards at all times, nor for its accuracy. Information on hazards due to wake vortices is contained in the Air Traffic Services Planning Manual (ICAO Doc 9426).

b. In issuing clearances or instructions, air traffic controllers should take into account the hazards caused by jet blast and propeller slipstream to taxiing aircraft, to aircraft taking off or landing, particularly when intersecting runways are being used, and to vehicles and personnel operating on the aerodrome.

c. When applicable, include the word SUPER or HEAVY, in the advice.

PHRASEOLOGY:

CAUTION WAKE TURBULENCE (traffic information).

EXAMPLE:

"Caution wake turbulence, preceding super Airbus three eighty, twelve o'clock, 8 miles."

2-1-22 TRAFFIC INFORMATION

Unless an aircraft is operating within the Class A airspace or omission is requested by the pilot, issue traffic information to all aircraft (IFR or VFR) on your frequency when in your judgment their proximity may diminish to less than the applicable separation minima. Where no separation minima applies, such as for VFR aircraft outside of Class C airspace, issue traffic information to those aircraft on your frequency when in your judgment their proximity warrants it. Provide this service as follows:

a. To radar identified aircraft:

1. Azimuth from aircraft in terms of the 12-hour clock, or
2. When rapidly maneuvering aircraft prevent accurate issuance of traffic as in 1 above, specify the direction from an aircraft's position in terms of the eight cardinal compass points (N, NE, E, SE, S, SW, W ,and NW). This method shall be terminated at the pilot's request.
3. Distance from aircraft in miles.
4. Direction in which traffic is proceeding and/or relative movement of traffic.

   NOTE—
   Relative movement includes closing, converging, parallel same direction, opposite direction, diverging, overtaking, crossing left to right, crossing right to left.

5. If known, type of aircraft and level.

   REFERENCE—
   DESCRIPTION OF AIRCRAFT TYPES, Para 2-4-21.

PHRASEOLOGY:

TRAFFIC, (number) O'CLOCK,

or when appropriate,

(direction)(number) MILES, (direction)-BOUND and/or (relative movement),

and if known,

(type of aircraft and level).

or when appropriate,

(type of aircraft and relative position), (number of feet) FEET ABOVE/BELOW YOU.

If level is unknown,

LEVEL UNKNOWN.

EXAMPLES:

"Traffic, eleven o'clock, one zero miles, southbound, converging, Heavy Boeing Seven Seven Seven, one one thousand."

"Traffic, twelve o'clock, one five miles, opposite direction, level unknown."

"Traffic, ten o'clock, one two miles, southeast bound, one thousand feet below you."

6. When requested by the pilot, issue radar vectors to assist in avoiding the traffic, provided the aircraft to be vectored is within your area of jurisdiction or coordination has been effected with the sector/ unit in whose area the aircraft is operating.
7. If unable to provide vector service, inform the pilot.

   REFERENCE—

   OPERATIONAL REQUESTS, Para 2-1-19.
8. Inform the pilot of the following when traffic you have issued is not reported in sight:
   (a) The traffic is no factor.
   (b) The traffic is no longer depicted on radar.

PHRASEOLOGY:

TRAFFIC NO FACTOR/NO LONGER OBSERVED,

or

(number) O'CLOCK TRAFFIC NO FACTOR/NO LONGER OBSERVED,

or

(direction) TRAFFIC NO FACTOR/NO LONGER OBSERVED.

b. To aircraft that are not radar identified:

1. Distance and direction from fix.
2. Direction in which traffic is proceeding.
3. If known, type of aircraft and level.
4. ETA over the fix the aircraft is approaching, if appropriate.

PHRASEOLOGY:

TRAFFIC, (number) MILES/MINUTES (direction) OF (aerodrome or fix), (direction)-BOUND,

and if known,

(type of aircraft and level),

ESTIMATED (fix)(time),

or

TRAFFIC, NUMEROUS AIRCRAFT VICINITY(location).

If level is unknown,

LEVEL UNKNOWN.

EXAMPLES:

"Traffic, one zero miles southwest of Magong V-O-R, northeast bound, Boeing Seven Seven Seven, descending to one one thousand."

"Traffic, reported one zero miles west of Sigang VORTAC, northeast bound, C-130, level unknown, estimated Chiayi TACAN one three one five."

"Traffic, eight minutes northwest of Hengchun VORTAC, northwest bound, DASH-eight, seven thousand, estimated Sigang VORTAC one zero three five."

"Traffic, numerous aircraft, vicinity of Hualian Aerodrome."

c. For aircraft displaying Mode C, not radar identified, issue indicated level.

EXAMPLE:

"Traffic, one o'clock, 6 miles, eastbound, level indicates six thousand five hundred."

REFERENCE—

TRAFFIC INFORMATION, Para 3-1-6.

VISUAL SEPARATION, Para 7-2-1.

VFR DEPARTURE INFORMATION, Para 7-5-10.

2-1-23 BIRD ACTIVITY INFORMATION

a. Issue advisory information on pilot-reported, tower observed, or radar-observed and pilot-verified bird activity. Include position, species or size of birds, if known, track of flight, and level. Do this for at least 15 minutes after receipt of such information from pilots or from adjacent units unless visual observation or subsequent reports reveal the activity is no longer a factor.

EXAMPLES:

"Flock of geese, one o'clock, seven miles, northbound, last reported at four thousand."

"Flock of small birds, southbound along Tam Sui River, last reported at three thousand."

"Numerous flocks of ducks, vicinity Tseng Chen Lake, level unknown."

b. Relay bird activity information to adjacent units and to FIC/FIS whenever it appears it will become a factor in their areas.

2-1-24 TRANSFER OF POSITION RESPONSIBILITY

The transfer of position responsibility shall be accomplished in accordance with appropriate unit directives each time the operational responsibility for a position is transferred from one specialist to another.

2-1-25 WHEELS DOWN CHECK

MILITARY

a. Advise military aircraft to check wheels down when being cleared for low approach, cleared to land, or cleared for a touch-and-go landing. This advice must be given even though the pilot has stated wheels down.

NOTE—

The intent is to remind the pilot to lower the wheels, not to place responsibility on the controller.

PHRASEOLOGY:

CHECK WHEELS DOWN, CLEARED TO LAND.

b. Approach/arrival control, GCA shall issue the wheels down check as follows:

1. To aircraft conducting ASR, PAR, or radar monitored approaches, before the aircraft starts descent on final approach.
2. To aircraft conducting instrument approaches and remaining on the radar unit's frequency, before the aircraft passes the final approach fix.

PHRASEOLOGY:

WHEELS SHOULD BE DOWN.

2-1-26 SUPERVISORY NOTIFICATION

Ensure supervisor/controller-in-charge is aware of conditions which impact sector/position operations including, but not limited to, the following:

a. Weather.

b. Equipment status.

c. Potential sector overload.

d. Emergency situations.

e. Special flights/operations.

2-1-27 POSSIBLE PILOT DEVIATION NOTIFICATION

When it appears that the actions of a pilot constitute a pilot deviation, notify the pilot, work load permitting.

PHRASEOLOGY:

(Identification) POSSIBLE PILOT DEVIATION ADVISE YOU CONTACT (unit) AT (telephone number).

2-1-28 PROCEDURES IN REGARD TO AIRCRAFT EQUIPPED WITH AIRBORNE COLLISION AVOIDANCE SYSTEMS (ACAS)

a. The procedures to be applied for the provision of air traffic services to aircraft equipped with ACAS shall be identical to those applicable to non-ACAS equipped aircraft. In particular, the prevention of collisions, the establishment of appropriate separation and the information which might be provided in relation to conflicting traffic and to possible avoiding action shall conform with the normal ATS procedures and shall exclude consideration of aircraft capabilities dependent on ACAS equipment.

b. When a pilot reports an ACAS resolution advisory (RA), the controller shall not attempt to modify the aircraft flight operation until the pilot reports “Clear of Conflict”.

c. Once an aircraft departs from its ATC clearance or instruction in compliance with an RA, or a pilot reports an RA, the controller ceases to be responsible for providing separation between that aircraft and any other aircraft affected as a direct consequence of the manoeuvre induced by the RA. The controller shall resume responsibility for providing separation for all the affected aircraft when:

   1. The controller acknowledges a report from the flight crew that the aircraft has resumed the current clearance; or

   2. The controller 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.

2-1-29 TERRAIN AWARENESS WARNING SYSTEM (TAWS) ALERTS

a. When an aircraft under your control jurisdiction informs you that it is responding to a TAWS (such as GPWS or EGPWS) alert, do not issue control instructions that are contrary to the TAWS procedure that a crew member has advised you that they are executing. Provide safety alerts regarding terrain or obstructions and traffic advisories for the aircraft responding to the TAWS alert and all other aircraft under your control jurisdiction, as appropriate.

b. Once the responding aircraft has begun a maneuver in response to TAWS alert, the controller is not responsible for providing approved separation between the aircraft that is responding to a TAWS alert

and any other aircraft, airspace, terrain or obstructions. Responsibility for approved separation resumes when one of the following conditions are met:

1. The responding aircraft has returned to its assigned altitude, or
2. A crew member informs you that the TAWS maneuver is completed and you observe that approved separation has been reestablished, or
3. The responding aircraft has executed an alternate clearance and you observe that approved separation has been reestablished.

REFERENCE—

SAFETY ALERT, PARA 2-1-8

P/CG TERM –TERRAIN AWARENESS AND WARNING SYSTEM (TAWS)

P/CG TERM –GROUND PROXIMITY WARNING SYSTEM (GPWS)

P/CG TERM –ENHANCED GROUND PROXIMITY WARNING SYSTEM (EGPWS)

P/CG TERM – CONTROLLED FLIGHT INTO TERRAIN (CFIT)

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Section 2. FLIGHT PLANS AND CONTROL INFORMATION

2-2-1 RECORDING INFORMATION

a. Record flight plan information required by the type of flight plan and existing circumstances. Use authorized abbreviations when possible.

b. When flight plans are filed directly with the ATC units, record all items given by the pilot into a FDR or on a paper flight progress strip.

2-2-2 FORWARDING INFORMATION

a. Forward the flight plan information to the appropriate ATC units.

b. During ATMS operation, the above manual actions are required in cases where the data is not forwarded automatically by the computer.

NOTE—
During ATMS operation, data is exchanged between interfaced automated facilities and both the data and time of transmission are recorded automatically.

2-2-3 FORWARDING VFR DATA

Forward aircraft departure times to Flight Following position or military operations offices when they have requested them. Forward other VFR flight plan data only if requested by the pilot.

2-2-4 IFR TO VFR FLIGHT PLAN CHANGE

Request a pilot to contact the appropriate units/positions, if the pilot informs you of a desire to change from an IFR to a VFR flight plan. No invitation to change from IFR flight to VFR flight is to be made either directly or by inference.

PHRASEOLOGY:

IFR FLIGHT CANCELLED AT (time), CONTACT (unit name or location name and terminal function), (frequency).

2-2-5 IFR FLIGHT PROGRESS DATA

Forward control information from controller to controller within a unit, then to the receiving unit as the aircraft progresses along its route. Where appropriate, use computer equipment in lieu of manual coordination procedures. Do not use the remarks section of FDR/flight progress strips in lieu of voice coordination to pass control information. Ensure that flight plan and control information is correct and up-to-date. When covered by a LOA/unit directive, the time requirements of subpara a. may be reduced, and the time requirements of subpara b.1. and para 2-2-8, FORWARDING AMENDED DATA, subpara a. may be increased up to 15 minutes when facilitated by automated systems or mandatory radar handoffs; or if operationally necessary because of manual data processing or nonradar operations, the time requirements of subpara a. may be increased.

a. Forward the following information at least 15 minutes before the aircraft is estimated to enter the receiving unit's area:

1. Aircraft identification.
2. Number of aircraft if more than one, heavy aircraft indicator "H/" if appropriate, type of aircraft, and aircraft equipment suffix.
3. Assigned level and ETA over last reporting point/fix in transferring unit's area or assumed departure time when the departure point is the last point/fix in the transferring unit's area.

4. Level at which aircraft will enter the receiving unit's area if other than the assigned level.
5. True airspeed.
6. Point of departure.
7. Route of flight remaining.
8. Destination aerodrome and clearance limit if other than destination aerodrome.
9. ETA at destination aerodrome (not required for military or scheduled air carrier aircraft).
10. Level requested by the aircraft if assigned level differs from requested level (within a unit only).

    NOTE—

    When an aircraft has crossed one unit 's area and assignment at a different level is still desired, the pilot will reinitiate his request with the next unit.

    REFERENCE—

    ANTICIPATED LEVEL CHANGES, Para 4-5-7.

11. When flight plan data must be forwarded manually and an aircraft has been assigned a beacon code by the computer, include the code as part of the flight plan.
12. Longitudinal separation being used between aircraft at the same level if it results in these aircraft having less than 10 minutes separation at the units' boundary.
13. Any additional non-routine operational information pertinent to flight safety.

b. Forward position report over last reporting point in the transferring unit's area if any of the following conditions exist:
   1. Time differs more than three minutes from estimate given.
   2. Requested by receiving unit.
   3. Agreed to between units.

c. Exchange flight plan and control information with an adjacent control position when an aircraft will be operating in such close proximity to the boundary that control of traffic within the adjacent sector may be affected.

2-2-6 MANUAL INPUT OF COMPUTER ASSIGNED BEACON CODES

When a flight plan is manually entered into the computer and a computer-assigned beacon code has been forwarded with the flight plan data, insert the beacon code in the appropriate field as part of the input message.

2-2-7 ALTRV INFORMATION

EN ROUTE

When an aircraft is a part of an approved ALTRV, forward only those items necessary to properly identify the flight, update flight data contained in the ALTRV APVL, or revise previously given information.

2-2-8 FORWARDING AMENDED DATA

a. Forward any amending data concerning previously forwarded flight plans except that revisions to ETA information in para 2-2-5, IFR FLIGHT PROGRESS DATA, need only be forwarded when the time differs by more than 3 minutes from the estimate given.

   PHRASEOLOGY:

   (Identification), REVISED (revised information).

   EXAMPLES:

"Dynasty Zero Zero Four, revised flight level, three three zero."

"Cathay Four One One, revised estimate, ELATO one zero zero five."

"Asia Two Zero Two, revised level, eight thousand."

"Dynasty Eight Zero Four, revised type, HEAVY B747."

REFERECNE:

IFR FLIGHT PROGRESS DATA, Para 2-2-5.

b. During ATMS operation, computer acceptance of an appropriate input message fulfills the requirement for sending amended data. For non-ATMS operation, the amendment data are considered acknowledged upon revision on a paper flight progress strip containing the amended data.

NOTE—

①. The successful utilization of automation equipment requires timely and accurate insertion of changes and/or new data.

②. If a pilot is not issued a computer-generated preferential route and if amendment data are not entered into the computer, the next controller will have incorrect route information.

c. Forward any amended control information and record the action on the appropriate FDR or paper flight progress strip. Additionally, when a route or level in a previously issued clearance is amended within 15 minutes of an aircraft's proposed departure time, the unit that amended the clearance shall coordinate the amendment with the receiving unit via verbal and automated means to ensure timely passage of the information.

NOTE—

The term "receiving" unit means the ATC unit that is expected to transmit the amended clearance to the intended aircraft/pilot.

d. Effect manual coordination on any interunit flight plan data that is not passed through automated means.

2-2-9 ARRIVAL MESSAGES

Forward an arrival message, when an aircraft has arrived at a destination aerodrome to those ATS units who requested the arrival report. If an aircraft lands at an alternate aerodrome, send an arrival message to the ATS unit at the departure aerodrome and to the ATS units through which the aircraft would have passed according to the flight plan, had it not diverted.

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Section 3. PRESENTATION AND UPDATING OF FLIGHT PLAN AND CONTROL DATA

2-3-1 GENERAL

a. The controller on duty shall be responsible for updating the information displayed.

b. All control data and flight plan updates shall be recorded directly into the Flight Data Record for ATMS operation, or on paper strips for non-ATMS operation.

c. For ATMS operation, the following data must be updated upon receipt or issue and coordination shall be executed if necessary:

1. actual time of departures
2. aircraft types
3. pilot position reports
4. pilot estimates
5. pilot reported levels
6. cleared flight levels
7. pre-cleared flight levels
8. route or amended route details
9. changes concerning aircraft equipment capability related to RVSM, RNP or RNAV.

d. For non-ATMS operation, use paper flight progress strips to post current data on air traffic and clearances required for control and other air traffic control services. To prevent misinterpretation when data is hand printed, use standard hand-printed characters.

1. Maintain only necessary current data and remove the strips from the flight progress boards when no longer required for control purposes. To correct, update, or preplan information:

   (a). Do not erase or overwrite any item. Use an “X” to delete a climb/descend and maintain arrow, an at or above/below symbol, a cruise symbol, and unwanted level information. Write the new level information immediately adjacent to it and within the same space. For other items, draw a horizontal line through it, and write the new item immediately adjacent to it and within the same space.

   (b). Do not draw a horizontal line through a level being vacated until after the aircraft has reported or is observed (valid Mode C) leaving the level.

   (c). Preplanning may be accomplished in red pencil.

2. Use an appropriate clearance symbol followed by a dash (-) and other pertinent information to clearly show the clearance status of an aircraft. To indicate delay status use:

   (a) The symbol “H” at the clearance limit when holding instructions have been included in the aircraft's original clearance. Show detailed holding information following the dash when holding differs from the established pattern for the fix; i.e., turns, leg lengths, etc.

   (b) The symbols “F” or “O” to indicate the clearance limit when a delay is not anticipated.

3. Manually prepared strips shall conform to the format of machine-generated strips and manual strip preparation procedures will be modified simultaneously with the operational implementation of changes in the machine-generated format (see fig 2-3-1).

NOTE—

A slant line crossing through the numeral zero and the underline of the letter “S” on handwritten portion of the flight progress strips are required only when there is reason to believe the lack of these markings could lead to a misunderstanding. The slant line cross through the numeral zero is required on weather data.

FIG 2-3-1 STANDARD RECORDING OF HAND PRINTED CHARACTERS

Typed	Hand Printed
A	*A*
B	*B*
C	*C*
D	*D*
E	*E*
F	*F*
G	*G*
H	*H*
I	*I*
J	*J*
K	*K*
L	*L*
M	*M*
N	*N*
O	O
P	*P*
Q	*Q*
R	*R*
S	*S*
T	*T*
U	*U*
V	*V*
W	*W*
X	*X*
Y	*Y*
Z	*Z*

Typed	Hand Printed
1	*1*
2	*2*
3	*3*
4	*4*
5	*5*
6	*6*
7	*7*
8	*8*
9	*9*
0	*Ø*

2-3-2 AIRCRAFT IDENTITY

Indicate aircraft identity by one of the following using combinations not to exceed seven alphanumeric characters:

a. Civil aircraft, including air carrier-aircraft letter-digit registration number including the 3-letter aircraft company designator followed by the trip or flight number.

EXAMPLES:

"CAL758." "MDA365." "B17918."

b. Military aircraft-

1. Prefixes indicating branch of service and/or type of mission followed by a number (see TBL 2-3-1)

TBL 2-3-1	
Prefix	Branch
A	Air force
M	Marine corps

R	Army
V	Navy

2. Assigned letters followed by flight number.

EXAMPLES:

"GA80"

c. Special-use - Approved special-use identifiers (see TBL 2-3-2)

TBL 2-3-2	
Prefix	**Mission**
FC	Flight Check
NA	National Airborne Service

2-3-3 AIRCRAFT EQUIPMENT SUFFIX

Indicate, for both VFR and IFR operations, the aircraft's radio communication, navigation, approach aid, and/or surveillance equipment and capability by adding the appropriate ICAO FPL equipment and capabilities symbol as follows:

a. Aircraft Radio Communication, Navigation and Approach Aid Equipment Suffix (see TBL 2-3-3)

TBL 2-3-3 Aircraft Equipment Suffix

Suffix	Aircraft Equipment
A	GBAS Landing System
B	LPV – APV with SBAS
C	Loran C
D	DME
E1-E3	ACARS applications
F	ADF
G	GNSS Note—When 'G' is presented then the external "GNSS augmentation" may be specified in the field 18 under "NAV/".
H	HF RTF
I	Inertial Navigation
J1-J7	CPDLC
L	ILS
M1-M3	Satellite RTF
N	No COM/NAV/APCH equipment carried, or equipment is unserviceable.
O	VOR
P1-P9	Reserved for RCP
R	PBN Approved Note—if 'R is used then PBN must be present in field 18.
S	Standard COM/NAV/APCH equipment for the route to be flown is carried and

	serviceable. (i.e., VHF, RTF, VOR and ILS) Note—If 'S' is used and other characters are present, then 'S' shall be the first character in the list.
T	TACAN
U	UHF RTF
V	VHF RTF
W	RVSM
X	MNPS (Minimum Navigation Performance Specification)
Y	8.33 kHz channel spacing
Z	Other equipment carried. Note—If 'Z' is used, than field 18 shall specify the other equipment carried, preceded by COM/ , NAV/ and/or DAT/ as appropriate.

b. Aircraft Surveillance Equipment and Capability Suffix (See TBL 2-3-4)

TBL 2-3-4 Aircraft Surveillance Equipment and Capability Suffix

Suffix	Aircraft Surveillance Equipment
N	Nil; no SURV equipment
A	Transponder- Mode A (4 digits - 4,096 codes)
C	Transponder- Mode A (4 digits – 4,096 codes) and Mode C
X	Transponder- Mode S without both aircraft identification and pressure-level transmission
P	Transponder- Mode S with pressure-level transmission but no aircraft ID transmission
I	Transponder — Mode S, including aircraft identification transmission, but no pressure-altitude transmission
S	Transponder- Mode S with both aircraft ID and pressure-level transmission
D	ADS Capability
E	Transponder-Mode S with aircraft ID、pressure-level transmission and ADS-B capability
H	Transponder-Mode S with aircraft ID、pressure-level transmission and enhanced surveillance capability
L	Transponder-Mode S with aircraft ID、pressure-level transmission、ADS-B capability and enhanced surveillance capability
B1	ADS-B with dedicated 1090 MHz ADS-B "out" capability.
B2	ADB-B with dedicated 1090 MHz ADS-B "out" and "in" capability.
U1	ADS-B "out" capability using UAT.
U2	ADS-B "out" and "in" capability using UAT.
V1	ADS-B "out" capability using VDL Mode 4.
V2	ADS-B "out" and "in" capability using VDL Mode 4.
D1	ADS-C with FANS 1/A capabilities.

G1	ADS-C with ATN capabilities.

2-3-4 CONTROL SYMBOLOGY

Use authorized control and clearance symbols or abbreviations for recording clearances, reports, and instructions. Control status of aircraft must always be current. You may use:

a. Plain language markings when it will aid in understanding information.

b. Locally approved identifiers. Use these only within your unit and not on teletypewriter or interphone circuits.

c. Plain sheets of paper or locally prepared forms to record information when flight progress strips are not used (see TBL 2-3-5 and TBL 2-3-6).

d. Control Information Symbols (see FIG 2-3-7).

TBL 2-3-5 Clearance abbreviations

Abbreviation	***Meaning***
A	Cleared to aerodrome (point of intended landing)
B	Center clearance delivered
C	ATC clears (when clearance relayed through non-ATC unit)
D	Cleared to depart from the fix
F	Cleared to the fix
H	Cleared to hold and instructions issued
L	Cleared to land
N	Clearance not delivered
Q	Cleared to fly specified sectors of a NAVAID defined in terms of tracks, bearings, radials or quadrants within a designated radius.
T	Cleared through (for landing and take-off through intermediate point)
V	Cleared over the fix
X	Cleared to cross (airway, route, radial) at (point)
Z	Tower jurisdiction

TBL 2-3-6 Miscellaneous Abbreviations

Abbreviation	***Meaning***
BC	Back track approach
FA	Final approach
FMS	Flight management system approach
GPS	GPS approach
I	Initial approach
ILS	ILS approach、ILS/DME approach
LDA	LDA approach、LDA/DME approach
LOC	LOC approach、LOC/DME approach
MA	Missed approach
NDB	NDB approach、NDB/DME approach
PA	Precision approach
PT	Procedure turn
QRF	Return Flight.
RA	Resolution Advisory (Pilot reported TCAS event)

RF	Radar Final
RH	Runway Heading
RNAV	Area Navigation Approach
RT	Radio Transfer
RP	Report immediately upon passing (fix/level)
RX	Report crossing
SA	Surveillance approach
SI	Straight-in approach
TA	TACAN approach、Hi-TACAN approach
TL	Turn left
TR	Turn right
VA	Visual approach
VR	VOR approach、VOR/DME approach

FIG 2-3-7 Control Information Symbols

Symbol	Meaning
T→( )	Depart (direction, if specified)
↑	Climb and maintain
↓	Descend and maintain
→	Cruise
@	At
X	Cross
	Maintain
	Join or intercept airway, track or course
	While in controlled airspace
	While in control area
	Enter control area
	Out of control area
NW NE E	Cleared to enter, depart, or through control zone. Indicate direction of flight by arrow and appropriate compass letter. Maintain Special VFR conditions (level if appropriate) while in control zone.
250K	Aircraft requested to adjust speed to 250 knots.
-20K	Aircraft requested to reduce speed 20 knots.
+30K	Aircraft requested to increase speed 30 knots.
(W)	Local Special VFR operations in the vicinity of (name) aerodrome are authorized until (time). Maintain special VFR conditions (level if appropriate).
>	Before
<	After or Past
170	Inappropriate level/flight level for direction of flight.(Underline assigned level/flight level in red.)
/	Until
( )	Alternate instructions
	Restriction
	At or Below

2.3.6 Flight Progress Strip

↕	At or Above
—(Dash)	From – to (route, time, etc.)
(Level) B(Level)	Indicates a block level assignment. Levels are inclusive, and the first level shall be lower than the second. Example: 310B370
V<	Clearance void if aircraft not off ground (time)
℄	Pilot canceled flight plan
✓	Aircraft has reported at assigned level. Example :80✓
✓	TERMINAL: Information forwarded (indicated information forwarded as required)
O	Information or revised information forwarded. (Circle, in red, inappropriate level/flight level for direction of flight or other control information when coordinated. Also circle, in red, the time (minutes) and level when a flight plan or estimate is forwarded. Use this method in both inter-unit and intra-unit coordination.
(50)	Other than assigned level reported (circle reported level)
10 / 6	DME holding (use with mileages) (Upper figure indicates distance from station to DME fix, lower figure indicates length of holding pattern. In this example, the DME fix is 10 miles out with a 6 mile pattern indicated.)
	DME arc of VORTAC, TACAN.
C(Freq.)	Contact (unit) or (freq.), (time fix, or level if appropriate). Insert frequency only when it is other than standard.
R	Radar contact
R	EN ROUTE: Requested level (preceding level information)
R	Radar service terminated
R	Radar contact lost
Ⓡ	Radar handoff (circle symbol when handoff completed)
RV	Radar vector
	Pilot resumed own navigation
E	EMERGENCY (in red)
W	WARNING (in red)
P	Point out initiated. Indicate the appropriate unit, sector, or position.
T	TERMINAL: Transit Flight (in red)
FUEL	Minimum fuel (in red)

NOTE—

The absence of an airway or route number between two fixes in the route of flight indicates "direct". No symbol or abbreviation is required.

Intentionally Blank

Section 4. RADIO AND INTERPHONE COMMUNICATIONS

2-4-1 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 except as follows:

TERMINAL: When combining positions in the tower, do not use ground control frequency for airborne communications.

NOTE—
Due to the limited number of frequencies assigned to towers for the ground control function, it is very likely that airborne use of a ground control frequency could cause interference to other towers or interference to your aircraft from another tower. When combining these functions, it is recommended combining them on local control. The ATIS may be used to specify the desired frequency.

2-4-2 MONITORING

Monitor interphones and assigned radio frequencies continuously.

2-4-3 PILOT ACKNOWLEDGMENT/READBACK

Ensure pilots acknowledge all Air Traffic Clearances and ATC Instructions. When a pilot reads back an Air Traffic Clearance or ATC Instruction:

a. Ensure that items read back are correct. If readback is incorrect or incomplete, make corrections as appropriate.

   NOTE—

   Pilots may acknowledge clearances, instructions, or other information by using "Wilco", "Roger", "Affirm", or other words or remarks.

b. Ensure the following are correct readback by the pilot:

   1. ATC route clearance.
   2. Clearances to enter, land on, take-off from, hold short of, cross, taxi and backtrack on, any runway.
   3. Runway-in-use, altimeter setting, SSR codes, level instructions, heading and speed instructions and, whether issued by the controller or contained in automatic terminal information service (ATIS) broadcasts, transition levels.

c. Ensure pilots use call signs and/or registration numbers in any read back acknowledging an Air Traffic Clearance or ATC Instruction.

   1. Pilots may acknowledge clearances, instructions, or other information by using "Wilco", "Roger", "Affirm", or other words or remarks.
   2. Until a pilot acknowledges a controller's clearance or instruction, a controller cannot know if a pilot will comply with the clearance or remain as previously cleared.

REFERENCE—

TAXI AND GROUND MOVEMENT OPERATIONS, Para 3-7-2.

COMMUNICATIONS FAILURE, Para 9-4-1

2-4-4 AUTHORIZED INTERRUPTIONS

As necessary, authorize a pilot to interrupt his communications guard.

NOTE—

Some users have adopted procedures to insure uninterrupted receiving capability with ATC when a pilot with only one operative communications radio must interrupt his communications guard because of a safety related problem requiring airborne communications with his 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 controllers of the NAVAID voice facility and the company frequency they will monitor.

2-4-5 AUTHORIZED TRANSMISSIONS

Transmit only those messages necessary for air traffic control or otherwise contributing to air safety.

2-4-6 FALSE OR DECEPTIVE COMMUNICATIONS

Take action to detect, prevent, and report false, deceptive, or phantom controller communications to an aircraft or controller. The following shall be accomplished when false or deceptive communications occur:

a. Correct false information.

b. Broadcast an alert to aircraft operating on all frequencies within the area where deceptive or phantom transmissions have been received.

EXAMPLE:

"Attention all aircraft, False ATC instructions have been received in the area of Taoyuan International Aerodrome. Exercise extreme caution on all frequencies and confirm instructions."

c. Collect pertinent information regarding the incident.

d. Notify the operational supervisor of the false, deceptive, or phantom transmission and report all relevant information pertaining to the incident

2-4-7 AUTHORIZED RELAYS

a. 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.

b. Relay official messages as required.

2-4-8 RADIO MESSAGE FORMAT

Use the following format for radio communications with an aircraft:

a. Sector/position on initial radio contact:

1. Identification of aircraft.
2. Identification of ATC unit.
3. Message (if any).
4. The word "over" if required.

b. Subsequent radio transmissions from the same sector/position shall use the same format except the identification of the ATC unit may be omitted.

TERMINAL: You may omit aircraft identification after initial contact when conducting the final portion of a radar approach.

REFERENCE—
AIRCRAFT IDENTIFICATION, Para 2-4-20.

2-4-9 ABBREVIATED TRANSMISSIONS

Transmissions may be abbreviated as follows:

a. 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 a CAA authorized call sign.

REFERENCE—
AIRCRAFT IDENTIFICATION, Para 2-4-20.

b. Omit the unit identification after communication has been established.

c. Transmit the message immediately after the callup (without waiting for the aircraft's reply) when the message is short and receipt is generally assured.

d. Omit the word "over" if the message obviously requires a reply.

2-4-10 INTERPHONE TRANSMISSION PRIORITIES

Give priority to interphone transmissions as follows:

a. 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.

b. Second priority - Clearances and control instructions.

c. Third priority - Movement and control messages using the following order of preference when possible:

1. Progress reports.
2. Departure or arrival reports.
3. Flight plans.

2-4-11 PRIORITY INTERRUPTION

Use the words “emergency” or “control” for interrupting lower priority messages when you have an emergency or control message to transmit.

2-4-12 INTERPHONE MESSAGE FORMAT

Use the following format for interphone intra/interunit communications:

a. Both the caller and receiver identify their unit and/or position in a manner that insures they will not be confused with another position.

NOTE—
Other means of identifying a position may be used. However, it must be operationally beneficial, and the procedure fully covered in a letter of agreement or a unit directive, as appropriate.

b. Caller states the type of coordination to be accomplished when advantageous. For example, handoff or approved as requested.

c. The caller states the message.

d. The receiver states the response to the caller's message followed by the receiver's operating initials.

e. The caller states his/her operating initials.

EXAMPLE:

Caller- “West, North.”

Receiver- “West.”

Caller – "Request direct Magong for All Nippon Niner Zero One."

Receiver – "All Nippon Niner Zero One direct Magong approved. Hotel Foxtrot."

Caller- "Golf Mike."

EXAMPLE*:*

Receiver – "West, go ahead override."

Caller – "North, request direct Magong for All Nippon Niner Zero One."

Receiver – "All Nippon Niner Zero One direct Magong approved. Hotel Foxtrot."

Caller- "Golf Mike"

f. ***TERMINAL***: The provision of subpara a., b., d., e., may be omitted provided:

1. Abbreviated standard coordination procedures are contained in a unit directive describing the specific conditions and positions that may utilize an abbreviated interphone message format; and
2. There will be no possibility of misunderstanding which positions are using the abbreviated procedures.

g. Interphone message termination may be omitted within Taipei FIR.

2-4-13 INTERPHONE MESSAGE TERMINATION

Terminate interphone messages with your operating initials.

2-4-14 WORDS AND PHRASES

a. Use the words and phrases in radiotelephony and interphone communications as contained in para 2-4-17.

b. For aircraft in the SUPER or HEAVY wake turbulence categories the word "SUPER" or "HEAVY" shall be included immediately after the aircraft call sign in the initial radiotelephony contact between such aircraft and ATC units.

EXAMPLE*:*

"Cathay Four Five Zero heavy."
"Emirate One Two Three super."

2-4-15 EMPHASIS FOR CLARITY

Emphasize appropriate digits, letters, or similar sounding words to aid in distinguishing between similar sounding aircraft identifications. Additionally:

a. Treat aircraft with similar sounding aircraft identifications by emphasizing appropriate digits, letters, or similar sounding words to aid in distinguishing between similar sounding aircraft identifications. Do not abbreviate similar sounding aircraft identifications.

REFERENCE—

AIRCRAFT IDENTIFICATION, Para 2-4-20, ABBREVIATED TRANSMISSIONS Para 2−4−9

b. Treat aircraft with similar sounding call signs by restating the call sign after the flight number.
EXAMPLE−

"Dynasty Tree one, Dynasty."

c. Notify each pilot concerned when communicating with aircraft having similar sounding identifications.

EXAMPLE:

"Dynasty Zero Zero Six, Dynasty, Taipei Control, Cathay Zero Zero Six is also on this frequency, acknowledge."

"Cathay Zero Zero Six Cathay, Taipei Control, Dynasty Zero Zero Six is also on this frequency, acknowledge."

"Smart Cat Two Three Zero, Taipei Tower, Smart Cat Two Zero Three is also on this frequency, acknowledge."

"Air Peach Niner Two Seven, Taipei Control, Air Peach Two Seven is also on this frequency, acknowledge"

"Dynasty One Seven Eight, the climbing clearance is for Dynasty One Zero Eight, I say again, Dynasty One Seven Eight, maintain five thousand."

REFERENCE—

AIRCRAFT IDENTIFICATION, Para 2-4-20.

d. Notify the supervisor (coordinator) 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.

2-4-16 ICAO PHONETICS

Use the ICAO pronunciation of numbers and individual letters. (See the ICAO radiotelephony alphabet and pronunciation in TBL 2-4-1).

TBL 2-4-1 ICAO PHONETICS

Character	Word	Pronunciation		Character	Word	Pronunciation
0	Zero	ZE-RO		H	Hotel	HOH **TELL**
1	One	WUN		I	India	**IN** DEE AH
2	Two	TOO		J	Juliett	**JEW** LEE ETT
3	Three	TREE		K	Kilo	**KEY** LOH
4	Four	FOW-ER		L	Lima	**LEE** MAH
5	Five	FIFE		M	Mike	MIKE
6	Six	SIX		N	November	NO **VEM** BER
7	Seven	SEV-EN		O	Oscar	**OSS** CAH
8	Eight	AIT		P	Papa	PAH **PAH**
9	Nine	NIN-ER		Q	Quebec	KEH **BECK**
	Hundred	HUN-DRED		R	Romeo	**ROW** ME OH
	Thousand	TOU-SAND		S	Sierra	SEE **AIR** AH
A	Alfa	**AL** FAH		T	Tango	**TANG** GO
B	Bravo	**BRAH** VOH		U	Uniform	**YOU** NEE FORM
C	Charlie	**CHAR** LEE		V	Victor	**VIK** TAH
D	Delta	**DELL** TAH		W	Whiskey	**WISS** KEY
E	Echo	**ECK** OH		X	X-ray	**ECKS** RAY
F	Foxtrot	**FOKS** TROT		Y	Yankee	**YANG** KEY
G	Golf	GOLF		Z	Zulu	**ZOO** LOO

NOTE—

Syllables to be emphasized in pronunciation are in bold face.

2-4-17 ICAO PHRASES

Phrase	Meaning
ACKNOWLEDGE	“Let me know that you have received and understood this message.”
AFFIRM	“Yes.”
APPROVED	“Permission for proposed action granted.”
BREAK	“I hereby indicate the separation between portions of the message.” *(To be used where there is no clear distinction between the text and other portions of the message.)*
BREAK BREAK	“I hereby indicate the separation between messages transmitted to different aircraft in a very busy environment.”
CANCEL	“Annul the previously transmitted clearance.”
CHECK	“Examine a system or procedure.” *(Not to be used in any other context. No answer is normally expected.)*
CLEARED	“Authorized to proceed under the conditions specified.”
CONFIRM	“I request verification of: (*clearance, instruction, action, information*).”
CONTACT	“Establish communications with...”
CORRECT	“True” or “Accurate”.
CORRECTION	“An error has been made in this transmission (*or* message indicated). The correct version is...”
DISREGARD	“Ignore.”
HOW DO YOU READ	“What is the readability of my transmission?”
I SAY AGAIN	“I repeat for clarity or emphasis.”
MAINTAIN	“Continue in accordance with the condition(s) specified” or in its literal sense, e.g. “Maintain VFR”.
MONITOR	“Listen out on (frequency).”
NEGATIVE	“No” *or* “Permission not granted” *or* “That is not correct” *or* “Not capable”.
OVER	“My transmission is ended, and I expect a response from you.” *Note— Not normally used in VHF communications.*
OUT	“This exchange of transmissions is ended and no response is expected.” *Note— Not normally used in VHF communications.*
READ BACK	“Repeat all, or the specified part, of this message back to me exactly as received.”
RECLEARED	“A change has been made to your last clearance and this new clearance supersedes your previous clearance or part thereof.”
REPORT	“Pass me the following information...”
REQUEST	“I should like to know...” *or* “I wish to obtain...”
ROGER	“I have received all of your last transmission.” *Note— Under no circumstances to be used in reply to a question requiring “READ BACK” or a direct answer in the affirmative (AFFIRM) or negative (NEGATIVE).*
SAY AGAIN	“Repeat all, or the following part, of your last transmission.”
SPEAK SLOWER	“Reduce your rate of speech.” *Note— maintain an even rate of speech not exceeding 100 words per minute. When a message is transmitted to an aircraft and its contents need to be recorded the speaking rate should be at a slower rate to allow for the*

Phrase	Meaning
	writing process. A slight pause preceding and following numerals makes them easier to understand;(from ANNEX 10, 5.2.1.5.3.b)
STANDBY	"Wait and I will call you." *Note— The caller would normally re-establish contact if the delay is lengthy. STANDBY is not an approval nor denial.*
UNABLE	"I cannot comply with your request, instruction, or clearance." *Note— UNABLE is normally followed by a reason.*
WILCO	*(Abbreviation for "will comply".)* "I understand your message and will comply with it."
WORDS TWICE	a) *As a request:* "Communication is difficult. Please send every word, or group of words, twice." b) *As information:* "Since communication is difficult, every word, or group of words, in this message will be sent twice."

2-4-18 NUMBERS USAGE

State numbers as follows:

NOTE—
All numbers except whole hundreds, whole thousands and combinations of thousands and whole hundreds shall be transmitted by pronouncing digit separately.

a. Serial numbers: The separate digits.

EXAMPLE:

Number	Statement
11,495	"One one four niner five."
20,069	"Two zero zero six niner."

b. Levels or flight levels:

1. Levels - Pronounce each digit in the number of hundreds or thousands followed by the word "hundred" or "thousand" as appropriate.

EXAMPLE:

Level	Statement
10,000	"One zero thousand."
11,000	"One one thousand."
2,500	"Two thousand five hundred."

2. Flight levels - The words "flight levels" followed by the separate digits of the flight level except for the case of flight levels in whole hundreds, which could be transmitted by pronouncing the digit of the whole hundred followed by the word HUNDRED.

EXAMPLE:

Flight level	Statement
130	"Flight level one three zero."
200	"Flight level two zero zero" or "Flight level two hundred."
270	"Flight level two seven zero."

3. OCA/MDA/DA Altitudes - The separate digits of the OCA/MDA/DA Altitudes.

EXAMPLE:

OCA/MDA/DA Altitudes	Statement
800	“Obstacle Clearance Altitude, eight zero zero.”
1,320	“Minimum Descent Altitude, one three two zero.”
486	“Decision height, four eight six.”

c. Time:

1. General time information - The four separate digits of the hour and minute/s based on the 24-hour clock in terms of Coordinated Universal Time (UTC).

EXAMPLES:

UTC	Time(12hr.)	Statement
1715	1:15a.m.	“One seven one five.”
0515	1:15p.m.	“Zero five one five.”

2. Upon request (Local Time) - The four separate digits of the hours and minute/s in terms of UTC followed by the local time equivalent; or the local time equivalent only. Local time may be based on the 24-hour clock system, and the word “local” shall be stated. The term “ZULU” may be used to denote UTC.

EXAMPLE:

Time	Statement
2230U(0630)	“Two two three zero. Zero six three zero Local.”

3. Time check - The word “time” followed by the four separate digits of the hour and minutes, and given to the nearest half minute.

EXAMPLE:

Time	Statement
1415:06	“Time, one four one five.”
1415:45	“Time, one four one six.”

4. Abbreviated time - The separate digits of the minutes only.

EXAMPLES:

Time	Statement
1415	“One five.”
1420	“Two zero.”

d. 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.”

e. Altimeter setting:

1.The word “QNH” followed by the separate digits of the altimeter setting, except for the case of a

setting of 1000 hPa which could be transmitted as ONE THOUSAND.

EXAMPLE:

Setting	Statement
30.01	“QNH, three zero zero one.”
1013	“QNH, one zero one three.”
1000	“QNH, one zero zero zero” or “QNH one thousand.”
998	“QNH, niner niner eight.”
(Location)29.97	“Taipei QNH, two niner niner seven.”

2. When requested, provided altimeter setting in inches and followed by the word “inches”.

Setting	Statement
30.01	“QNH, three zero zero one inches.”

f. Surface wind: The word ‘wind’, followed by the separate digits of the indicated wind direction to the nearest 10 degrees, followed by the word ‘degrees’, the separate digits of the wind speed, followed by the word ‘knots’, to include any gusts.

EXAMPLE:

Wind zero three zero degrees two zero knots.

Wind one six zero degrees one eight knots gusting three zero knots.

g. 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.”

h. Radar beacon codes: The separate digits of the four digit code.

EXAMPLE:

Code	Statement
1000	“One zero zero zero.”
2100	“Two one zero zero.”

i. Runways: The word “runway”, followed by the separate digits of the runway designation. For a parallel runway, state the word “left”, “right”, or “center” if the letter “L”, “R”, or “C” is included in the designation.

EXAMPLE:

Designation	Statement
05L	“Runway Zero Five Left”
27R	“Runway Two Seven Right.”

j. Frequencies:

1.The separate digits of the frequency, inserting the word “decimal” where the decimal point occurs.

(a) In the case of both the fifth and sixth digits being zeros, only the first four digits should be used.

(b) When the frequency is in the L/MF band, include the word “KiloHertz”.

EXAMPLE:

Frequency	Statement
118.000 MHz	“One one eight decimal zero.”
118.005 MHz	“One one eight decimal zero zero five.”
118.010 MHz	“One one eight decimal zero one zero.”
369.0 MHz	“Three six niner decimal zero.”
121.5 MHz	“One two one decimal five.”
135.275MHz	“One three five decimal two seven five.”
302 kHz	“Three zero two kilohertz.”

2. ***MILITARY*:** Local channelization numbers may be used in lieu of frequencies for locally based aircraft when local procedures are established to ensure that local aircraft and ATC units use the same channelization.

EXAMPLE:

Frequency	Statement
330.8 MHz	“Local channel one seven.”
247.8 MHz	“Local channel one seven.”

3. Issue TACAN frequencies by stating the assigned two- or three- digit channel number.

EXAMPLE:

“TACAN channel niner seven.”

k. Speeds:

1. The separate digits of the speed followed by “knots”.

EXAMPLE:

Speed	Statement
250	“Two five zero knots.”
190	“One niner zero knots.”

2. 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.”

l Miles - The separate digits of the mileage followed by the word “mile”.

EXAMPLE:

“Three zero mile arc east of APU.”

“Traffic, one o’clock, two five miles, northbound, D-C eight, flight level two seven zero.”

2-4-19 UNIT IDENTIFICATION

Identify units as follows:

a. Aerodrome control towers - State the name of the unit followed by the word “tower”.

EXAMPLE:

“Songshan Tower.”

“Kaohsiung Tower.”

“Taoyuan Tower.”

b. Area control center - State the name of the unit followed by the word “center” in interphone or “control” in radio.

c. Approach control units - State the name of the unit followed by the word “approach”.

EXAMPLE:

“Taipei Approach.”

“Kaohsiung Approach.”

“Hualien Approach.”

d. Functions within a terminal unit - State the name of the unit followed by the name of the function.

EXAMPLE:

“Taipei Delivery.”

“Songshan Ground.”

e. CAA Air/Ground station - State the name of the station followed by the word “radio”.

EXAMPLE:

“Taipei Radio.”

f. Radar units having ASR or PAR but not providing approach control service - State the name of the unit followed by the letters “G-C-A”.

EXAMPLE:

“Magong G-C-A.”

“Tainan G-C-A.”

“Taoyuan G-C-A.”

2-4-20 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 initial callup except use the correct identification after communications have been established. Identify aircraft as follows:

a. ROC registry aircraft – state one of the following:

REFERENCE—

RADIO MESSAGE FORMAT, Para 2-4-8.

ABBREVIATED TRANSMISSIONS, Para 2-4-9.

EMPHASIS FOR CLARITY, Para 2-4-15.

NUMBERS USAGE, Para 2-4-18.

1. Civil - State the prefix “Bravo” followed by the numbers/letters of the aircraft registration.

EXAMPLE:

"Bravo One Eight Eight Two"

NOTE—
The prefix "Bravo" denotes an R.O.C. aircraft registry.

2. Air carrier and other civil aircraft having CAA authorized call signs - State the call sign followed by the flight number in separated digit.

   EXAMPLE:

   "Fareastern One Six Five."

   "Mandarin Seven One Five"

3. If aircraft identification becomes a problem when the procedures specified above are used, the call sign shall be restated after the flight number of the aircraft involved.

   EXAMPLE:

   "Dynasty Two Zero Three Dynasty."

   "Cathay Zero Zero Five Cathay."

4. Air ambulance - State the word "MEDEVAC", if used by the pilot, followed by the call sign and flight number ,or the numbers/letters of the registration number.

   EXAMPLE:

   "MEDEVAC Bravo Five Five Two Zero Three."

   "MEDEVAC Transasia One One Niner Two."

5. National aircraft - State the service name followed by the aircraft number or the mission number.

   NOTE—

   National aircraft indicates military and National airborne service corps' aircraft.

   EXAMPLE:

   "NA One Zero Three."

   "Army Two One One"

   "Romeo Zero Three Two."

6. Other special flight - Flight Inspection of Navigational Aids - State the call sign "FLIGHT CHECK" followed by the digits of the registration number.

   EXAMPLE:

   "Flight Check One Three Five"

b. 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 call sign.

   EXAMPLE:

   NOVEMBER Five-Seven-Eight-Two-Six

   CITATION FOXTROT ALFA BRAVO CHARLIE DELTA

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 FOXTROT LIMA ROMEO LIMA GOLF

3. The flight number in separate digits.

   EXAMPLE:

"Cathay Six Eight."

4. ***Military*** - The name of the country and the military service followed by the separate digits or letters of the registration or call sign.

   EXAMPLE:

   "U.S. Air Force One One."

c. Use the following phraseologies if it becomes necessary to change the call sign of an aircraft to avoid call sign confusion:

PHRASEOLOGY:

CHANGE YOUR CALL SIGN TO (new call sign) [UNTIL FURTHER ADVISED];

REVERT TO FLIGHT PLAN CALL SIGN (call sign) [AT (significant point)].

REFERENCE—
EMPHASIS FOR CLARITY, Para 2-4-15.

2-4-21 DESCRIPTION OF AIRCRAFT TYPES

Except for SUPER and HEAVY aircraft, describe aircraft as follows when issuing traffic information.

a. ***Military***:

1. Military designator, with numbers spoken in group form, or

   EXAMPLE:

   "F-five", "F-sixteen", "Mirage", "I-D-F".

2. Service and type, or

3. Type only if no confusion or misidentification is likely.

   EXAMPLE:

   "Air Force bomber", "Navy fighter", "Fighter", "Bomber"

b. Air Carrier:

1. Manufacturer's model or type designator.

2. Add the manufacture's name, company name or other identifying features when confusion or misidentification is likely.

   EXAMPLE:

   " L-ten eleven", "American MD-eighty", "Airbus three two zero", "Boeing seven fifty- seven"

c. When issuing traffic information to aircraft following a SUPER or HEAVY aircraft, specify the word "SUPER" or "HEAVY" before the manufacturer's name and model.

EXAMPLE:
"SUPER Airbus three-eighty."

"HEAVY Airbus three-thirty."

"HEAVY Boeing seven forty- seven."

REFERENCE—
TRAFFIC INFORMATION, Para 2-1-22.

2-4-22 AIRSPACE CLASSES

A, B, C, D, E, and G airspace are pronounced in the ICAO phonetics for clarification. The term "Class" may be dropped when referring to airspace in pilot/controller communications.

EXAMPLE:

“B55525 cleared to enter Delta airspace.”

“B55525 cleared to enter Songshan Charlie airspace.”

“B55525 cleared to enter Hengchun Echo surface airspace.”

Section 5. ROUTE AND NAVAID DESCRIPTION

2-5-1 AIR TRAFFIC SERVICE (ATS) ROUTES

Describe ATS routes as follows:

a. Airways or routes
State the letter(s) of the airways or routes phonetically, followed by the number of the airway or route in separated digit.

EXAMPLE:

"Alfa One."

"Whiskey Four."

"November Eight Niner Two."

b. Transitions
State the designation of the transition as published followed by the word of transition.

EXAMPLE:

"Lima One Transition."

c. SIDs, STARs

State the designation of SID or STAR as published, followed by the word of departure or arrival as appropriate.

EXAMPLE:

"Anbu Five Departure."

"Sigang One Bravo Arrival."

2-5-2 NAVAID TERMS

a. Describe NAVAIDs as follows:

1. State the name or phonetic alphabet equivalent (location identifier) of a NAVAID when using it in a routing.

EXAMPLE:
"B576 Alfa Papa Uniform (ANBU) B591."

2. When utilized as the clearance limit, state the name of the NAVAID followed by the type of NAVAID if the type is known.

PHRASEOLOGY:

CLEARED TO (NAVAID name and type).

EXAMPLE:

"Cleared to Magong VOR."

b. Describe radials, arcs, tracks, bearings, and quadrants of NAVAID's as follows:

1. VOR/VORTAC/TACAN WAYPOINTS - State the name of the NAVAID or waypoint followed by the separate digits of the radial/azimuth/bearing (omitting the word "degrees") and the word "radial/azimuth/bearing".

EXAMPLE:

"Anbu zero five zero radial."

2. Arcs about VOR-DME/VORTAC/TACAN NAVAID's- State the distance in miles from the

NAVAID followed by the words “mile arc”, the direction from the NAVAID in terms of the 8 principal points of the compass, the word “of”, and the name of the NAVAID.

EXAMPLE:

“Two zero mile arc southwest of Houlong VOR.”

3. Quadrant within a radius of NAVAID- State direction from NAVAID in terms of the quadrant; e.g., NE, SE, SW, NW, followed by the distance in miles from the NAVAID.

   EXAMPLE:

   “Cleared to fly northeast quadrant of Sigang VORTAC within four zero mile radius.”

   REFERENCE—

   ROUTE USE, Para 4-4-1.

4. Nondirectional beacons- State the track to or the bearing from the radio beacon, omitting the word “degrees”, followed by the words “track to” or “bearing from”, the name of the radio beacon, and the words radio beacon.

   EXAMPLE:

   “Three four zero bearing from Alfa Papa (AP) Radio Beacon.”

2-5-3 NAVAID FIXES

Describe fixes determined by reference to a radial/localizer/azimuth and distance from a VOR-DME/VORTAC/TACAN as follows:

a. When a fix is not named, state the name of the NAVAID followed by a specified radial/localizer/azimuth, and state the distance in miles followed by the phrase “mile fix”.

   EXAMPLE:

   “Anbu zero five zero radial three seven mile fix.”

b. When a fix is charted on a SID, STAR, en route chart, or approach plate, state the name of the fix.

   EXAMPLE:

   “Anna”, “Frank”

c. Use specific terms to describe a fix. Do not use expressions such as “passing Alfa One” or “passing Whiskey Four.”

Section 6. WEATHER INFORMATION

2-6-1 FAMILIARIZATION

Become familiar with pertinent weather information when coming on duty, and stay aware of current weather information needed to perform air traffic control duties.

NOTE—

Meteorological data shall be provided by the designated meteorological service provider. For details, please refer to Meteorological Service for International Air Navigation.

2-6-2 SIGMET ALERT

a. When workload permit, broadcast a SIGMET alert once on all frequencies, except emergency frequency, if aircraft on your frequency/s will be affected.

b. Terminal units have the option to limit the SIGMET broadcast as follows: aerodrome control and approach control positions may opt to broadcast SIGMET alerts only when any part of the area described is within 50 NM of the airspace under their jurisdiction.

c. Include the following information in SIGMET broadcasts:

1. SIGMET ident.
2. General description of the area affected.
3. Brief description of the type of weather.

NOTE—

The message should be brief but contain enough information to alert pilots to significant weather conditions along their route of flight.

PHRASEOLOGY:

ATTENTION ALL AIRCRAFT, SIGMET ID (Brief description of area affected and type of weather.)

EXAMPLE:

"Attention all aircraft, SIGMET-One. From Houlong to Zonli. Severe turbulence and severe icing below one zero thousand feet. Expected to continue beyond zero three zero zero Zulu."

2-6-3 PIREP INFORMATION

Significant PIREP information includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, wind shear and turbulence (including clear air turbulence) of moderate or greater intensity, volcanic eruptions and volcanic ash clouds, and other conditions pertinent to flight safety.

a. Solicit PIREP's when requested or when one of the following conditions exists or is forecast for your area of jurisdiction.

1. Ceilings at or below 5,000 feet. These PIREP's shall include cloud base/top and cloud coverage reports when feasible.
2. Visibility (surface or aloft) at or less than 8 km.
3. Thunderstorms and related phenomena.
4. Turbulence of moderate degree or greater.
5. Icing of light degree or greater.
6. Wind shear.
7. Braking action reports.

8. Volcanic ash clouds.
9. Detection of sulfur gases (SO2 or H2S), associated with volcanic activity, in the cabin.

   NOTE—

   The smell of sulfur gases in the cockpit may indicate detected or reported

   and/or possible entry into an ash-bearing cloud. SO2 is identifiable as the sharp, acrid odor of a freshly struck match. H2S has the odor of rotten eggs.

b. Record with the PIREPs:
   1. Time
   2. Aircraft position.
   3. Aircraft type.
   4. Level.
   5. When the PIREP involves icing include:
      (a) Icing type and intensity.
      (b) Air temperature in which icing is occurring.

c. Obtain PIREP's directly from the pilot, or if the PIREP has been requested by another unit, you may instruct the pilot to deliver it directly to that unit.

   PHRASEOLOGY:

   REPORT/SAY FLIGHT CONDITIONS.

   or if appropriate,

   REPORT/SAY (specific conditions - i.e., ceiling, visibility, etc.) CONDITIONS.

   if necessary

   OVER (fix),

   or

   ALONG PRESENT ROUTE,

   or

   BETWEEN (fix) AND (fix)

d. Handle PIREPs as follows:
   1. Relay pertinent PIREP information to concerned aircraft in a timely manner.
   2. Relay all operationally significant PIREP's to the weather unit.
   3. *TERMINAL*: Relay all operationally significant PIREP's to:
      (a) The appropriate intraunit positions.
      (b) Other concerned terminal or en route ATC units, including non-CAA units.
      (c) Use the words gain and/or loss when describing to pilots the effects of windshear on airspeed.

      EXAMPLE:

      "Cathay Four Zero One, a Boeing seven forty seven, previously reported windshear, loss of two five knots at four hundred feet."

      "United Eight Zero One, a D-C Niner, previously reported windshear, gain of two five knots between niner hundred and six hundred feet, followed by a loss of five zero knots between five hundred feet and the surface."

2-6-4 INFORMATION REGARDING ADVERSE WEATHER

a. Information that an aircraft appears likely to penetrate an area of adverse weather should be issued in sufficient time to permit the pilot to decide on an appropriate course of action, including that of requesting advice on how best to circumnavigate the adverse weather area, if so desired.

NOTE—

Depending on the capabilities of the ATS surveillance system, areas of adverse weather may not be presented on the situation display. An aircraft's weather radar will normally provide better detection and definition of adverse weather than radar sensors in use by ATS.

b. In vectoring an aircraft for circumnavigating any area of adverse weather, the controller should ascertain that the aircraft can be returned to its intended or assigned flight path within the coverage of the ATS surveillance system and, if this does not appear possible, inform the pilot of the circumstances.

NOTE—

Attention must be given to the fact that under certain circumstances the most active area of adverse weather may not be displayed.

PHRASEOLOGY:

WEATHER/CHAFF AREA BETWEEN (number) O'CLOCK AND (number) O'CLOCK (number) MILES,

or

(number) MILE BAND OF WEATHER/CHAFF FROM (fix or number of miles and direction from fix) TO (fix or number of miles and direction from fix),

or

WEATHER ECHO BETWEEN (number) O'CLOCK AND (number) O'CLOCK, (number) MILES. MOVING (direction).

or

DEVIATION APPROVED, (restrictions if necessary), ADVISE WHEN ABLE TO:

RETURN TO COURSE,

or

RESUME OWN NAVIGATION.

or

FLY HEADING (heading)

or

PROCEED DIRECT / DIRECT TO (name of NAVAID).

DEVIATION (restrictions if necessary) APPROVED, [MAINTAIN (level)], (if applicable) EXPECT TO RESUME (SID, STAR, etc.) AT (NAVAID, fix, waypoint).

DEVIATION (restrictions if necessary) APPROVED, WHEN ABLE, PROCEED DIRECT / DIRECT (name of NAVAID/WAYPOINT/FIX).

or

DEVIATION (restrictions if necessary) APPROVED, WHEN ABLE, FLY HEADING (degrees), VECTOR TO JOIN (airway/SID/STAR name) AND ADVISE.

DEVIATION (restrictions if necessary) APPROVED, ADVISE CLEAR OF WEATHER.

UNABLE DEVIATION (state possible alternate courses of action).

UNABLE REQUESTED DEVIATION, IF ABLE, TURN (number of degrees) DEGREES (left or right) / FLY HEADING (heading) VECTOR FOR (traffic or airspace), ADVISE CLEAR OF WEATHER.

REFERENCE—

METHODS, Para 5-6-2.

2-6-5 CALM WIND CONDITIONS

TERMINAL

Describe the wind as calm when the wind velocity is less than one knot.

REFERENCE—

TAILWIND COMPONENTS, Para 3-5-2.

2-6-6 REPORTING WEATHER CONDITIONS

a. Forward current weather changes to the appropriate control unit as follows:

   1. When the official weather changes to a condition which is below 1,500 feet ceiling or below the highest circling minimum, whichever is greater, or less than 5 km visibility, and when it improves to a condition which is better than those above.

   2. Changes which are classified as special weather observations during the time that weather conditions are below 1,500 feet ceiling or the highest circling minimum, whichever is greater, or less than 5 km visibility.

b. If the receiving unit informs you that weather reports are not required for a specific time period, discontinue the reports. The time period specified should not exceed the duration of the receiving controller's tour of duty.

c. ***EN ROUTE:*** When you determine that weather reports for an aerodrome will not be required for a specific time period, inform tower of this determination. The time period specified should not exceed the duration of receiving controller's tour of duty.

2-6-7 DISSEMINATING WEATHER INFORMATION

TERMINAL

Observed elements of weather information shall be disseminated as follows:

a. General weather information, such as "large breaks in the overcast", "visibility lowering to the south", or similar statements which do not include specific values, and any elements derived directly from instruments, pilots, or radar may be transmitted to pilots or other ATC units without consulting the weather reporting station.

b. Specific values, such as ceiling and visibility, may be transmitted if obtained by one of the following means:

   1. You are properly certificated and acting as official weather observer for the elements being reported.

   2. You have obtained the information from the official observer for the elements being reported.

   3. The weather report was composed or verified by the weather station.

   4. The information is obtain from an official Automated Weather Observation System (AWOS).

c. Differences between weather elements observed from the tower and those reported by the weather station shall be reported to the official observer for the element concerned.

2-6-8 CHAFF SERVICE

MILITARY

a. Military issues pertinent information on observed/reported chaff areas. Provide radar navigational guidance and/or approve deviations around weather or chaff areas when requested by the pilot.

1. Issue chaff information by defining the area of coverage in terms of azimuth (by referring to the 12-hour clock) and distance from the aircraft or by indicating the general width of the area and the area of coverage in terms of fixes or distance and direction from fixes.
2. When a deviation cannot be approved as requested and the situation permits, suggest an alternative course of action.

b. Inform TACC or approach control unit if you observe any chaff on radar which might affect their operations.

PHRASEOLOGY:

CHAFF AREA BETWEEN (number) O'CLOCK AND (number) O'CLOCK (number) MILES,

or

(number) MILE BAND OF CHAFF FROM (fix or number of miles and direction from fix)

TO (fix or number of miles and direction from fix),

or

WEATHER ECHO BETWEEN (number) O'CLOCK AND (number) O'CLOCK, (number) MILES. MOVING (direction).

or

DEVIATION APPROVED, (restrictions if necessary), ADVISE WHEN ABLE TO:

RETURN TO COURSE,

or

RESUME OWN NAVIGATION.

or

FLY HEADING (heading)

or

PROCEED DIRECT TO (name of NAVAID).

UNABLE DEVIATION (state possible alternate courses of action).

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Section 7. ALTIMETER SETTINGS

2-7-1 CURRENT SETTINGS

Current altimeter settings shall be obtained from direct-reading instruments or directly from weather reporting stations.

REFERENCE—

DEPARTURE INFORMATION, Para 3-9-1.

FORWARDING INFORMATION TO APPROACH CONTROL, Para 3-10-1.

TERMINAL INFORMATION, Para 4-7-8

2-7-2 ALTIMETER SETTING ISSUANCE BELOW LOWEST USABLE FLIGHT LEVEL

a. ***TERMINAL***: Identify the source of an altimeter setting when issued for a location other than the aircraft's departure or destination aerodrome.

b. ***ENROUTE***: Identify the source of all altimeter settings when issued.

PHRASEOLOGY:

(If the altimeter is one hour old or less), (unit name) ***QNH*** *(setting).*

or

(If the altimeter is more than one hour old),(unit name) ***QNH*** *(setting)* ***MORE THAN ONE HOUR OLD.***

c. Issue the altimeter setting:

1. To en route aircraft at least one time while operating in your area of jurisdiction.
2. ***TERMINAL***: To all departures. Unless specifically requested by the pilot, the altimeter setting need not be issued to local aircraft operators who have requested this omission in writing or to scheduled air carriers.

   REFERENCE—

   DEPARTURE INFORMATION, Para 3-9-1.
3. ***TERMINAL***: To arriving aircraft, when first assigning a level below the transition level. The Tower may omit the altimeter if the aircraft is sequenced or vectored to the aerodrome by the approach control having jurisdiction at that unit.

   REFERENCE—

   TERMINAL INFORMATION, Para 4-7-8.

   APPROACH INFORMATION, Para 5-10-2.
4. ***ENROUTE***: For the destination aerodrome to arriving aircraft approximately 50 miles from the destination if an approach control unit does not serve the aerodrome.
5. In addition to the altimeter setting provided, issue changes in altimeter setting to aircraft executing a non-precision instrument approach as frequently as practical when the official weather report includes the remarks “pressure falling rapidly”.

d. If the altimeter setting must be obtained by the pilot of an arriving aircraft from another source, instruct the pilot to obtain the altimeter setting from that source.

NOTE—

The destination altimeter setting, whether from a local or remote source, is the setting upon which the instrument approach is predicated.

e. When issuing clearance to descend below the lowest usable flight level, advise the pilot of the altimeter setting in accordance to the Altimeter Setting Procedure published in AIP ENR 1.7.

Section 8. RUNWAY VISIBILITY REPORTING – TERMINAL

2-8-1 FURNISH RVR VALUES

Where RVR equipment is operational, irrespective of subsequent operation or non-operation of navigational or visual aids for the application of RVR as a takeoff or landing minima, furnish the values for the runway in use in accordance with para 2-8-3, TERMINOLOGY.

NOTE—

Readout capability of different type/model RVR equipment varies. For example, older equipment minimum readout value is 200M. Newer equipment may have minimum readout capability as low as 30M. Readout value increments also may differ. Older equipment have minimum readout increments of 60M. New equipment increments below 240M are 30M.

2-8-2 ARRIVAL/DEPARTURE RUNWAY VISIBILITY

a. Issue current touchdown RVR for the runway(s) in use:

   1. When visibility is 1500 meters or less regardless of the value indicated.
   2. When RVR indicates a reportable value regardless of the visibility.

      NOTE—

      Reportable values are: RVR 2000 meters or less.

b. Issue both mid-point and rollout RVR when the value of either is less than 600 meters and the touchdown RVR is greater than the mid-point or roll-out RVR.

c. Aerodrome control shall issue the current RVR to each aircraft prior to landing or departure in accordance with subpara a. and b.

2-8-3 TERMINOLOGY

a. Provide RVR information by stating the abbreviation RVR, the runway, and the indicated value. When issued along with other weather elements, transmit these values in the normal sequence used for weather reporting.

   EXAMPLE:

   "R-V-R Runway One Zero eight hundred meters."

b. When two or more RVR systems serve the runway in use, report the indicated values for the different locations in terms of touchdown, mid, and roll-out/stop end as appropriate. Where reports for three locations are given, the indication of these locations may be omitted.

   EXAMPLE:

   "R-V-R Runway One Zero Touchdown one thousand meters, roll-out not available."

   "R-V-R Runway Two Three Touchdown one thousand meters, Mid eight hundred meters, stop end five hundred meters."

   "R-V-R Runway zero five left one thousand meters, eight hundred meters, five hundred meters."

c. When there is a requirement to issue an RVR value and a visibility condition greater or less than the reportable values of the equipment is indicated, state the condition as "MORE THAN" or "LESS THAN" the appropriate minimum or maximum readable value.

   EXAMPLE:

   "R-V-R Runway Three Six more than one thousand five hundred meters."

d. When a readout indicates a rapidly varying visibility condition (300 meters or more for RVR), report the current range of visibility variance.

EXAMPLE:

"R-V-R Runway Two Eight varying between three seven five and six hundred meters upward tendency."

Section 9. AUTOMATIC TERMINAL INFORMATION SERVICE PROCEDURES

2-9-1 APPLICATION

Where available, use ATIS to provide aerodrome and terminal area operational and meteorological information to aircraft.

a. Identify each ATIS message by a phonetic letter code word at both the beginning and the end of the message. Each alphabet letter phonetic word shall be used sequentially beginning with “Alfa”, ending with “Zulu”.

b. The ATIS recording shall be reviewed for completeness, accuracy, speech rate, and proper enunciation before being transmitted.

2-9-2 OPERATING PROCEDURES

Maintain an ATIS message that reflects the most current arrival and departure information.

a. Make a new recording when any of the following occur:

   1. Upon receipt of any new official weather regardless of whether there is or is not a change in values.
   2. When runway braking action reports are received that indicate runway braking is worse than that which is included in the current ATIS broadcast.
   3. When there is a change in any other pertinent data, such as runway change, instrument approach in use, new or canceled NOTAMs/SIGMETs/PIREPs etc.

b. When a pilot acknowledges that he has received the ATIS broadcast, controllers may omit those items contained in the broadcasts if they are current. Ask the pilot to confirm receipt of the current ATIS information if a pilot does not initially state the appropriate ATIS code.

c. Broadcast on all appropriate frequencies to advise aircraft of a change in the ATIS code/message.

   EXAMPLE:

   “Attention all aircraft, information ALFA current.”

   “Attention all aircraft, information BRAVO current. MICROBURST advisories in effect.”

   “Attention all aircraft, information CHARLIE current. Numerous flocks of ducks in the vicinity of (name) aerodrome, altitude unknown.”

d. Issue the current weather, runway in use, approach information, and pertinent NOTAMs to pilots who are unable to receive the ATIS.

   EXAMPLE:

   “Confirm you have information Alfa.”

   “Information Bravo now current, visibility five kilometers.”

   “Information CHARLIE now current, Ceiling 1500 Broken.”

   “Information CHARLIE now current, advise when you have CHARLIE.”

2-9-3 CONTENT

Include the following in ATIS broadcast, as appropriate:

a. Aerodrome/unit name, phonetic letter code, time of weather sequence. (UTC)

b. Instrument/visual approach/s in use.

c. Runway/s in use. (for arrivals and departures)

d. Runway condition Report (RCR) when provided.

REFERENCE—

Landing Area Condition, Para 3-3-1

e. Other essential operational information such as taxiway closures which affect the entrance or exit of runways-in-use, other closures which impact aerodrome operations, other NOTAMs and PIREPs pertinent to operations in the terminal area. Include available information of known bird activity.

f. Wind direction (magnetic) and speed.

g. Visibility and, when applicable RVR.

h. Present weather.

i. Ceiling, temperature, dew point, altimeter setting.

j. Low level wind shear (LLWS) when reported by pilot or is detected on a low level wind shear alert system (LLWAS)/Weather Systems Processor (WSP).

REFERENCE—

LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES, Para 3-1-8.

k. Trend forecast, when available.

l. When a runway length has been temporarily or permanently shortened, ensure that the word "WARNING" prefaces the runway number, and that the word "shortened" is also included in the text of the message.

1. Available runway length, as stated in the NOTAM, must be included in the ATIS broadcast. This information must be broadcast for the duration of the construction project.

2. For permanently shortened runways, units must continue to broadcast this information for a minimum of 30 days or until the AIP has been updated, whichever is longer.

PHRASEOLOGY:

WARNING, RUNWAY (number) HAS BEEN SHORTENED, (length in feet) FEET /METER AVAILABLE.

m. Other optional information as local conditions dictate in coordination with ATC. This may include such items as VFR arrival frequencies, temporary aerodrome conditions, or other perishable items that may appear only for a matter of hours or a few days on the ATIS message.

n. Instructions for the pilot to acknowledge receipt of the ATIS message by informing the appropriate controller on initial contact.

EXAMPLE:

METAR RCTP 250130Z 02021KT 2000 RA SCT005 BKN018CB OVC030 25/21 Q1023 WS ALL RWY NOSIG=

Taiwan /Taoyuan International Aerodrome Information Alfa; zero one three zero Zulu, expect I-L-S Approach; Runway Zero Five Left and Zero Five Right; taxiway November One Zero closed due to construction in progress; wind zero two zero degrees two one knots; visibility two thousand meters; rain; cloud scattered five hundred feet, broken CB one thousand eight hundred feet, overcast three thousand feet; temperature two five; dew point two one; Q-N-H one zero two three hectopascals; wind shear all runways, nosig, inform Taipei Approach or Taipei Tower on initial contact you have Alfa.

SPECI RCSS 150617Z 06027G47KT 020V100 0900 R10/0900N SHRA SCT003 BKN006 BKN030 15/04 Q1026 TEMPO 2000 RMK RA AMT 9.0MM=

Song Shan Aerodrome Information Bravo; zero six one seven Zulu; Expect I-L-S Approach; Runway One Zero; wind zero six zero degrees two seven knots gusting four seven knots, varying between zero two zero and one zero zero degrees; visibility nine hundred meters; RVR Runway One Zero nine hundred meters, no distinct tendency; rain shower; cloud, scattered three hundred feet, broken six hundred feet, broken three thousand feet; temperature one five; dew point zero four; Q-N-H one zero two six

hectopascals; trend temporary visibility two thousand meters, inform Taipei Approach or Song Shan Tower on initial contact you have Bravo.

METAR RCTP 120200Z 05015KT 6000 RA BKN020 22/18 Q1023
0120 05L 2/2/5 25/50/50 06/06/NR STANDINGWATER/STANDING WATER/WET
0150 05R 2/5/5 25/50/50 06/NR/NR STANDINGWATER/WET/WET

Taiwan /Taoyuan International Aerodrome Information Charlie; zero two zero zero Zulu, expect I-L-S Approach; Runway Zero Five Left and Zero Five Right;
runway zero five left surface condition code two two five
issued at zero one two zero Zulu coverage two five percent five zero percent five zero percent
depth six millimeters six millimeters not reported
standing water standing water wet
runway zero five right surface condition code two five five
issued at zero one five zero Zulu coverage two five percent five zero percent five zero percent
depth six millimeters not reported not reported
standing water wet wet,
wind zero five zero degrees one five knots; visibility six thousand meters; rain; cloud broken two thousand feet; temperature two two; dew point one eight; Q-N-H one zero two three hectopascals, inform Taipei Approach or Taipei Tower on initial contact you have Charlie.

o. When all 3 runway segments runway condition codes are reporting a code of 6, the RCR is no longer reportable.

NOTE—

RWYCC are reported in a three-character group separated by each runway third. The direction for listing the runway thirds provided by the aerodrome operator are in the direction as seen from the lower designation number.

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Chapter 3. AERODROME TRAFFIC CONTROL-TERMINAL

Section 1. GENERAL

3-1-1 FUNCTIONS OF AERODROME CONTROL TOWERS

a. Issue information and clearances to aircraft to achieve a safe, orderly and expeditious flow of air traffic on and in the vicinity of an aerodrome with the object of preventing collision(s) between:

1. Aircraft flying within the designated area of responsibility of the control tower, including the aerodrome traffic circuits.

NOTE—

"Rules of the Air" require pilots operating on or in the vicinity of an aerodrome to 'observe other aerodrome traffic for the purpose of avoiding collisions'. Due to the limited airspace around terminal locations, traffic information can aid pilots in observing other aircraft operating within Class C, Class D or Class E surface airspace and transiting aircraft operating in proximity to terminal locations.

2. Aircraft operating on the maneuvering area.
3. Aircraft landing and taking off.
4. Aircraft and vehicles operating on the maneuvering area.
5. Aircraft on the maneuvering area and obstructions on that area.

b. Maintain a continuous watch to the maximum extent possible on observed or known traffic flight operations on and in the vicinity of the aerodrome, as well as vehicles, equipment and personnel on the maneuvering area. Watch shall be maintained by visual observation, augmented in low visibility conditions by radar when available.

NOTE—

"Rules of the Air" Article 20. Nothing in these rules shall relieve the pilot-in-command of an aircraft from the responsibility of taking such action, including collision avoidance maneuvers based on resolution advisories provided by ACAS equipment, as will best avert collision. An aircraft shall not be operated in such proximity to other aircraft as to create a collision hazard.

c. The functions of an aerodrome control tower may be performed by different control or working positions, such as:

1. aerodrome controller, normally responsible for operations on the runway and aircraft flying within the area of responsibility of the aerodrome control tower;
2. ground controller, normally responsible for traffic on the maneuvering area with the exception of runways;
3. clearance delivery position, normally responsible for delivery of start-up and ATC clearances to departing IFR flights.

3-1-2 CONTROL OF RUNWAYS-IN-USE

The aerodrome controller has primary responsibility for operations conducted on the runways-in-use and must control the use of those runways. Positive coordination and control is required as follows:

NOTE—

Exceptions may be authorized only if procedural deviation to this handbook has been approved by the associated authorities.

a. Ground control must obtain approval from aerodrome control before authorizing an aircraft or a vehicle to cross or use any portion of a runway-in-use. The coordination shall include the point/intersection at the runway where the operation will occur.

PHRASEOLOGY:

CROSS (runway) AT (point/intersection)

b. When the aerodrome controller authorizes another controller to cross a runway-in-use, the aerodrome controller shall verbally specify the runway to be crossed and the point/intersection at the runway where the operation will occur preceded by the word "cross."

PHRASEOLOGY:

CROSS (runway) AT (point/intersection).

c. The ground controller shall advise the aerodrome controller when the coordinated runway operation is complete. This may be accomplished verbally or through visual aids as specified by a unit directive.

d. Authorization for aircraft/vehicles to taxi/proceed on or along a runway-in-use, for purposes other than crossing, shall be provided via direct communications on the appropriate aerodrome control frequency. This authorization may be provided on the ground control frequency after coordination with aerodrome control is completed for those operations specifically described in a unit directive.

NOTE—

The MILITARY establish aerodrome operating procedures in accordance with MILITARY LOA.

e. The aerodrome controller shall coordinate with the ground controller before using a runway not previously designated as active.

REFERENCE—

COORDINATION BETWEEN AERODROME AND GROUND CONTROLLERS, Para 3-1-3.

3-1-3 COORDINATION BETWEEN AERODROME AND GROUND CONTROLLERS

Aerodrome and ground controllers shall exchange information as necessary for the safe and efficient use of aerodrome runways and maneuvering areas. This may be accomplished via verbal means, flight progress strips, other written information, or automation displays. As a minimum provide aircraft identification and applicable runway/intersection/taxiway information as follows.

a. Ground control shall notify aerodrome control when a departing aircraft has been taxied to a runway other than one previously designated as active.

REFERENCE—

CONTROL OF RUNWAYS-IN-USE, Para 3-1-2.

b. Ground control shall notify aerodrome control of any aircraft taxied to an intersection for takeoff unless departure from that intersection is specifically designated via prior coordination or unit directive as the standard operating procedure for the runway to be used. When standard procedures require departures to use a specific intersection, ground control shall notify aerodrome control when aircraft are taxied to other portions of the runway for departure.

REFERENCE—

WAKE TURBULENCE SEPARATION FOR INTERSECTION DEPARTURE, Para 3-9-8.

c. When the runways in use for landing/departing aircraft are not visible from the tower or the aircraft using them are not visible on radar, advise the aerodrome /ground controller of the aircraft's location before releasing the aircraft to the other controller.

3-1-4 CONTROL OF OTHER THAN AIRCRAFT TRAFFIC

When an aircraft is landing or taking off, do not permit vehicles or personnel in direct communications with the control tower to hold closer to the runway-in-use than:

a. If at a taxiway/runway intersection – at the runway holding position.

b. At a location other than a taxiway/runway intersection – at a distance equal to the separation distance of

the runway-holding position.

NOTE—

① In radiotelephony, 'runway holding position' is referred to as 'runway holding point' to avoid confusion with the non-ICAO phraseology 'taxi into position and hold'.

② Establishing hold lines/signs is the responsibility of the aerodrome manager. The operator is responsible to properly position the aircraft, vehicle, or equipment at the appropriate hold line/sign or designated point. The requirements in paragraph 3-1-1 Functions of Aerodrome Control Towers, remain valid as appropriate.

REFERENCE—

RUNWAY PROXIMITY, Para 3-7-4.

TOUCH-AND-GO OR STOP-AND-GO OR LOW APPROACH, Para 3-8-2.

LEVEL RESTRICTED LOW APPROACH, Para 3-10-9.

3-1-5 RUNWAY INCURSION OR OBSTRUCTED RUNWAY

a. In the event the aerodrome controller, after a take-off clearance or a landing clearance has been issued, becomes aware of a runway incursion or the imminent occurrence thereof, or the existence of any obstruction on or in close proximity to the runway likely to impair the safety of an aircraft taking off or landing, appropriate action shall be taken as follows:

1. cancel the take-off clearance for a departing aircraft;
2. cancel the landing clearance for a landing aircraft and take any other necessary measures or instruct a landing aircraft to execute a go-around or missed approach as the case maybe;
3. in all cases inform the aircraft of the runway incursion or obstruction and its location in relation to the runway.

Note—

Animals and flocks of birds may constitute an obstruction with regard to runway operations. In addition, an aborted take-off or a go-around executed after touchdown may expose the aeroplane to the risk of overrunning the runway. Moreover, a low altitude missed approach may expose the aeroplane to the risk of a tail strike. Pilots may, therefore, have to exercise their judgement in accordance with "Rules of the Air" (Article 7), concerning the authority of the pilot-in-command of an aircraft.

REFERENCE—

CANCELLATION OF TAKE-OFF CLEARANCE, Para 3-9-10.

b. Pilots and air traffic controllers shall report any occurrence involving an obstruction on the runway or a runway incursion.

3-1-6 TRAFFIC INFORMATION

a. Issue information on essential aerodrome traffic in a timely manner, either directly or through approach control, when such information is necessary in the interests of safety or when requested by the pilot. Essential aerodrome traffic consists of any aircraft, vehicle or personnel on or near the manoeuvring area, or traffic operating in the vicinity of the aerodrome, which may constitute a hazard to the aircraft concerned.

b. Describe vehicles, equipment, or personnel on or near the maneuvering area in a manner which will assist pilots in recognizing them.

EXAMPLE:

"Mower left of Runway Two Seven."

"Trucks crossing approach end of Runway Zero Five."

"Workman on Taxiway Bravo."

"Aircraft left of Runway One Eight."

c. Describe the relative position of traffic in an easy to understand manner, such as “to your right” or “ahead of you.”

EXAMPLE:

“Traffic, China Airlines B747 on downwind leg to your left.”

“Beech 1900 inbound from Lima Kilo on straight in approach to Runway One Zero.”

“Traffic, Boeing 737 on 2−mile final to the parallel runway.”

d. When using a certified tower *ASD*, you may issue traffic information using the standard radar phraseology prescribed in para 2-1-22, TRAFFIC INFORMATION.

REFERENCE—

LEVEL RESTRICTED LOW APPROACH, Para 3-10-10.

3-1-7 AIRCRAFT POSITION DETERMINATION

Determine the position of an aircraft before issuing taxi instructions, or take-off clearance. The aircraft’s position may be determined visually by the controller, by the use of ATS surveillance system that enables the identification of aircraft where visual determination may be uncertain, or by pilot reports. If you are unable to determine, either visually or by ATS surveillance system, that a landing or taxiing aircraft has cleared the runway, request the aircraft to report when it has vacated the runway.

NOTE—

When an aircraft has been requested to report that the runway has been vacated, the report shall be given when the entire aircraft is beyond the relevant runway-holding position.

REFERENCE—

AERODROME SURFACE DETECTION PROCEDURES, Chapter 3, section 6.

3-1-8 LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES

a. When low level wind shear/microburst is reported by pilots or detected by the Low Level Wind Shear Alert Systems (LLWAS) or Weather Systems Processor (WSP), controllers must issue the alert to all arriving and departing aircraft until the alert is broadcast on the ATIS and pilots indicate they have received the appropriate ATIS code. A statement “LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES IN EFFECT” must be included on the ATIS for 20 minutes following the last report or indication of wind shear/microburst.

REFERENCE—

PIREP INFORMATION, Para 2-6-3.

CONTENT, Para 2-9-3.

FORWARDING INFORMATION TO APPROACH CONTROL, Para 3-10-1.

b. At units without ATIS, ensure that wind shear/microburst information is broadcast to all arriving and departing aircraft for 20 minutes following the last report or indication of wind shear/microburst.

c. LLWAS/WSP provides the capability of displaying wind shear alerts, microburst alerts and wind information oriented to the threshold, departure end of a runway and centerfield. The Alphanumeric Alarm Display (AAD) allows the controller to read the displayed alert without any need for interpretation.

NOTE—

The LLWAS and WSP are designed to detect low level wind shear conditions around the periphery of an aerodrome, typically out to three nautical miles from the runway threshold.

d. At locations equipped with LLWAS or WSP, the aerodrome controller must provide wind shear alerts or microburst alerts as follows:

NOTE—

The requirements for issuance of wind information remain valid as appropriate under this paragraph, as specified in para 3-9-1, DEPARTURE INFORMATION and para 3-10-1, FORWARDING INFORMATION TO APROACH CONTROL.

1. If a wind shear or microburst alert is received for the runway in use, issue the alert information for that runway to arriving and departing aircraft as it is displayed on the AAD display.

   PHRASEOLOGY:

   (Runway)(arrival/departure), WIND SHEAR/MICROBURST ALERT, (windspeed) KNOTS GAIN/LOSS, (location).

   EXAMPLE:

   10-A MBA 40K – 3MF.

   RUNWAY 10 ARRIVAL MICROBURST ALERT, 40 KNOT LOSS, 3 MILE FINAL.

   EXAMPLE:

   28-D WSA 25K+ 2MD

   RUNWAY 28 DEPARTURE WIND SHEAR ALERT, 25 KNOT GAIN, 2 MILE DEPARTURE.

2. If requested by the pilot or deemed appropriate by the controller, issue the displayed wind information oriented to the threshold, departure end of the runway or centerfield.

   PHRASEOLOGY:

   (Runway) DEPARTURE / THRESHOLD / CENTERFIELD WIND (direction) DEGREES (velocity)KNOTS.

3. If there are indications that wind shear is occurring outside the system, an alert message will be displayed with an asterisk (*) advising of a possible wind shear outside of the system network.

   PHRASEOLOGY:

   (Appropriate alert information) POSSIBLE WIND SHEAR OUTSIDE THE NETWORK

   EXAMPLE:

   *05D WSA 15K—RWY 050 15**

   RUNWAY 05 DEPARTURE WINDSHEAR ALERT, 15 KNOT LOSS, ON THE RUNWAY, POSSIBLE WIND SHEAR OUTSIDE THE NETWORK.

4. When there is a microburst alert, in addition to issuing the alert information to pilots, the aerodrome controller should query the pilots' intentions as appropriate.

   EXAMPLE:

   23A MBA 35K – 2MF

   RUNWAY 23 ARRIVAL MICROBURST ALERT, 35 KNOT LOSS, TWO MILE FINAL, SAY INTENTIONS.

5. The LLWAS is designed to be operated with fewer than the total set of network sensors. When the DEGRADED status message appears on the AAD, and likely activity of wind shear/microburst (e.g. frontal activity, convective storms, PIREPs) is reported, a statement "WIND SHEAR DETECTION SYSTEM DEGRADED" must be included on the ATIS.

6. The LLWAS/WSP is inoperable when the following status messages appear on the AAD: "SUPPORT", "INITIALIZATION" or "OFF". When these status messages appear on the AAD, and likely activity of wind shear/microburst (e.g. frontal activity, convective storms, PIREPs) is reported, a statement "WIND SHEAR DETECTION SYSTEM UNAVAILABLE" shall be included on the ATIS.

3-1-9 USE OF TOWER AIR SITUATION DISPLAYS (ASD)

When authorized by and subject to conditions prescribed by the appropriate ATS authority, air situation displays may be used in the provision of aerodrome control service to perform the following functions:

a. Monitoring of aircraft on final approach.

b. Monitoring of other aircraft in the vicinity of the aerodrome.

c. Establishing ATS surveillance separation between succeeding departing aircraft; and

d. Providing navigation assistance to VFR flights.

PHRASEOLOGY:

... (callsign) SUGGEST PROCEED ... (direction) – BOUND ... (reason)

... (call sign) SUGGEST HEADING ... (degrees) ... (reason)

e. To provide information and instructions to aircraft operating within the surface airspace for which the tower has responsibility.

EXAMPLE:

*Turn base leg now***.**

3-1-10 OBSERVED ABNORMALITIES

Whenever an abnormal configuration or condition of an aircraft, including conditions such as landing gear not extended or only partly extended, or unusual smoke emissions from any part of the aircraft, is observed by or reported to the aerodrome controller, advise the aircraft without delay.

PHRASEOLOGY:

(Item) APPEAR/S (observed condition).

EXAMPLE:

“Landing gear appears up.”

“Landing gear appears down and in place.”

“Rear baggage door appears open.”

3-1-11 SUSPECTED DAMAGE ON DEPARTURE

When requested by the flight crew of a departing aircraft suspecting damage to the aircraft, the departure runway used shall be inspected without delay and the flight crew advised in the most expeditious manner as to whether any aircraft debris, or bird or animal remains have been found or not.

3-1-12 SURFACE AIRSPACE RESTRICTIONS

a. If traffic conditions permit, approve a pilot's request to cross Class C, Class D or Class E surface airspace or exceed the Class C, Class D or Class E surface airspace speed limit. Do not, however, approve a speed in excess of 250 knots.

NOTE—

AIP paragraph ENR 1.8.8. permits speeds in excess of 250 knots when so required or the situations listed in the paragraph.

REFERENCE—

SURFACE AIRSPACE, Para 2-1-17.

b. Do not approve a pilot's request or ask a pilot to conduct unusual maneuvers within surface airspace of Class C, D or E surface airspace if they are not essential to the performance of the flight.

EXCEPTION: A pilot's request to conduct aerobatics practice activities may be approved, if prior permission has been obtained from appropriate authority, and the activity will have no adverse effect on safety of the air traffic operation or result in a reduction of service to other users.

NOTE—

These unusual maneuvers include unnecessary low passes, unscheduled flybys, practice instrument approaches to levels below specified minima (unless a landing or touch-and-go is to be made), or any so-called "buzz jobs" wherein a flight is conducted at a low level and/or a high rate of speed for thrill purposes. Such maneuvers increase hazards to persons and property and contribute to noise complaints.

3-1-13 ESTABLISHING TWO-WAY COMMUNICATIONS

Pilots are required to establish two-way radio communications before entering the Class D airspace. If the controller responds to a radio call with, "(a/c call-sign) standby," radio communications have been established and the pilot can enter the Class D airspace. If workload or traffic conditions prevent immediate provision of Class D services, inform the pilot to remain outside the Class D airspace until conditions permit the services to be provided.

PHRASEOLOGY:

(aircraft callsign) REMAIN OUTSIDE DELTA AIRSPACE AND STANDBY.

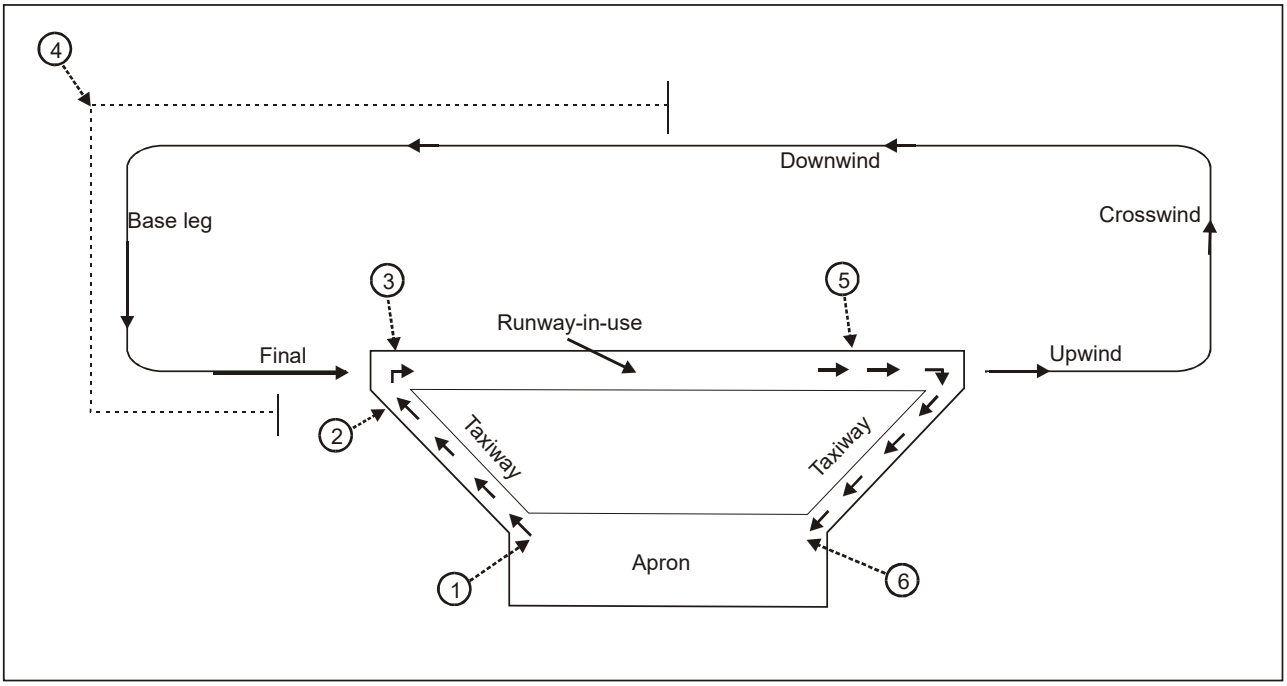
REFERENCE—

VISUAL SEPARATION, Para 7-2-1.

3-1-14 AERODROME AND TAXI CIRCUIT

The following positions of aircraft in the traffic and taxi circuits are the positions where the aircraft normally receive aerodrome control tower clearances. The aircraft should be watched closely as they approach these positions so that proper clearances may be issued without delay. Where practicable, all clearances should be issued without waiting for the aircraft to initiate the call.

FIG 3-1-1



Position 1 Aircraft initiates call to taxi for departing flight. Runway-in-use information and taxi clearances are given here.

Position 2 If there is conflicting traffic, the departing aircraft will be held at this position. Engine run-up will, when required, normally be performed here.

Position 3 Take-off clearance is issued here, if not practicable at position 2.

Position 4 Clearance to land is issued here as practicable.

Position 5 Clearance to taxi to apron is issued here.

Position 6 Parking information issued here, if necessary.

Note—

Arriving aircraft executing an instrument approach procedure will normally enter the traffic circuit on final except when visual maneuvering to the landing runway is required.

Section 2. VISUAL SIGNALS

3-2-1 LIGHT SIGNALS

Use ATC light signals from the TBL 3-2-1 to control aircraft and the movement of vehicles, equipment and personnel on the maneuvering area when radio communications cannot be employed.

TBL 3-2-1 ATC Light Signals

Meaning			
	From aerodrome control to:		
Light	**Aircraft in flight**	**Aircraft on the ground**	**Movement of vehicles, equipment and personnel.**
Steady green	Cleared to land	Cleared for take-off	Not applicable
Steady red	Give way to other aircraft and continue circling	Stop	Stop
Series of green flashes	Return for landing*	Cleared to taxi	Permission to cross landing area or to move onto taxiway
Series of red flashes	Aerodrome unsafe, do not land.	Taxi clear of landing area in use	Move off the landing area or taxiway and watch out for aircraft
Series of white flashes Series	Land at this aerodrome and proceed to apron. *	Return to starting point on the aerodrome	Vacate maneuvering area in accordance with local instructions
* Clearances to land to taxi will be given in due course.			

3-2-2 ADDITIONAL LIGHT SIGNALS

In emergency conditions or if the signals in 3-2-1 are not observed, flash the runway or taxiway lights. This means vacate the runway and observe the tower for a light signal.

3-2-3 RECEIVER-ONLY ACKNOWLEDGMENT

To obtain acknowledgment from an aircraft equipped with receiver only, request the aircraft to do the following:

a. Fixed-wing aircraft -
   1. Between sunrise and sunset -
      (a) Move ailerons or rudders while on the ground.
      (b) Rock wings while in flight.
   2. Between sunset and sunrise - Flash navigation or landing light.

b. Helicopters -
   1. Between sunrise and sunset -

(a) While hovering, either turn the helicopter toward the controlling unit and flash the landing light or rock the tip path plane (rotor).

(b) While in flight, either flash landing light or rock the tip path plane.

2. Between sunset and sunrise - Flash landing light or search light.

PHRASEOLOGY:

... (call sign) [REPLY NOT RECEIVED] ACKNOWLEDGE BY MOVING AILERONS [or RUDDER]; or ROCKING WINGS; or FLASHING LANDING LIGHT.

Section 3. AERODROME CONDITIONS

3-3-1 LANDING AREA CONDITION

If you observe or are informed of any condition which affects the safe use of a landing area:

NOTE—

① The aerodrome authority/military operations office is responsible for observing and reporting the condition of the landing area.

② It is the responsibility of the authority operating the aerodrome to provide the tower with current information regarding aerodrome conditions.

③ A disabled aircraft on a runway, after occupants are clear, is normally handled by aerodrome authority/military operations office personnel in the same manner as any obstruction, e.g., construction equipment.

a. Relay the information to the aerodrome authority/military operations office concerned.

b. Copy verbatim any information received and record the name of the person submitting it.

c. Confirm information obtained from other than authorized aerodrome or CAA personnel unless this function is the responsibility of the military operations office.

d. If you are unable to contact the aerodrome authority, issue a Notice to Airmen publicizing an unsafe condition and inform the management or operator as soon as practicable.

EXAMPLE:

"Disabled aircraft on runway."

NOTE—

① Legally only the aerodrome authority/military operations office can close a runway.

② Military controllers are not authorized to issue NOTAM. It is the responsibility of the military operations office.

e. Runway Condition Report (RCR).

1. Furnish RCR, as received from the aerodrome operator, to aircraft via the ATIS.

EXAMPLE:

RCTP
0120 05L 2/2/5 25/50/50 06/06/NR STANDINGWATER/STANDING WATER/WET
0150 05R 2/5/5 25/50/50 06/NR/NR STANDINGWATER/WET/WET

Taoyuan international aerodrome runway zero five left surface condition code two two five
issued at zero one two zero Zulu
coverage two five percent five zero percent five zero percent
depth six millimeters six millimeters not reported
standing water standing water wet
runway zero five right surface condition code two five five
issued at zero one five zero Zulu
coverage two five percent five zero percent five zero percent
depth six millimeters not reported not reported
standing water wet wet

2. When an update to the RCR is provided, verbally issue Runway Condition Code (RWYCC) to all aircraft until the ATIS broadcast can be updated.

EXAMPLE:

Runway Two Seven, SURFACE CONDITION CODE five, five, five.

3. At aerodromes without ATIS, verbally issue Runway Condition Code (RWYCC) to all aircraft.

4. Verbally issue RCR upon pilot request, workload permitting.

f. In the absence of RCR, issue to aircraft only factual information, as reported by the aerodrome authority,

concerning the condition of the runway surface.

EXAMPLE:

"All runways covered with mud six centimeter deep"

g. Whenever information is provided concerning runway surface conditions that may adversely affect aircraft braking action, the following terms shall be used, as necessary:

DRY

WET

SLIPPERY WET

STANDING WATER

3-3-2 CLOSED/UNSAFE RUNWAY INFORMATION

If an aircraft requests to takeoff, land, or touch-and-go on a closed or unsafe runway, inform the pilot the runway is closed or unsafe, and

a. If the pilot persists in his/her request, quote him/her the appropriate parts of the NOTAM applying to the runway and inform him/her that a clearance cannot be issued.

PHRASEOLOGY:

RUNWAY (runway number) CLOSED/UNSAFE.

If appropriate, (Quote Notice to Airmen information),

UNABLE TO ISSUE DEPARTURE/ LANDING/ TOUCH-AND-GO CLEARANCE.

b. Except as permitted by para 4-8-6, SIDE-STEP MANEUVER, where parallel runways are served by separate ILS systems and one of the runways is closed, the ILS associated with the closed runway should not be used for approaches unless not using the ILS would have an adverse impact on the operational efficiency of the aerodrome.

REFERENCE—

LANDING CLEARANCE, Para 3-10-5.

AERODROME CONDITIONS, Para 4-7-10.

3-3-3 TIMELY INFORMATION

Issue aerodrome condition information necessary for an aircraft's safe operation in time for it to be useful to the pilot. Include the following, as appropriate:

a. Construction work on or immediately adjacent to the maneuvering area.

b. Rough portions of the maneuvering area.

c. Braking conditions caused by ice, snow, slush or water.

d. Temporary hazards, including parked aircraft and birds on the ground or in the air.

e. Irregular operation of part or all of the aerodrome lighting system.

f. Volcanic ash on any aerodrome surface area and whether the ash is wet or dry (if known).

NOTE—

Braking action on wet ash may be degraded. Dry ash on the runway may necessitate minimum use of reverse thrust.

g. Other pertinent aerodrome conditions.

REFERENCE—

REPORTING ESSENTIAL FLIGHT INFORMATION, Para 2-1-11.

LEVEL RESTRICTED LOW APPROACH, Para 3-10-10.

AERPDROME CONDITIONS, Para 4-7-10.

3-3-4 BRAKING ACTION

a. Furnish quality of braking action received from pilots upon request as follows:

1. Describe the quality of braking action using the term “good,” “good to medium,” “medium,” “medium to poor,” “poor,” or “less than poor.” If the pilot reports braking action in other than the foregoing terms, ask him to categorize braking action in these terms.

2. Include type of aircraft from which the report is received.

EXAMPLE:

"Braking action medium to poor, reported by Boeing Seven-Eight-Seven."

"Braking action poor, reported by an Airbus Three-Twenty-One."

3. If no report has been received, inform the pilot.

EXAMPLE:

“NO BRAKING ACTION REPORTS RECEIVED”

b. When receiving special air-reports by voice communications concerning braking action, air traffic service units shall forward them without delay to the appropriate aerodrome operator. When one pilot has reported a runway braking action of LESS THAN POOR, the information shall be disseminated.

3-3-5 ARRESTING SYSTEM OPERATION

a. For normal operations, arresting systems remotely controlled by air traffic control shall remain in the retracted or down position.

NOTE—

① Readiness/rigging of the equipment is the responsibility of the operations department.

② A request to raise a barrier or hook cable means the barrier or cable on the departure end of the runway. If an approach end engagement is required, the pilot or military authority will specifically request that the approach end cable be raised.

b. Raise aircraft arresting systems whenever:

1. Requested by a pilot.

NOTE—

The standard emergency phraseology for a pilot requesting an arresting system to be raised for immediate engagement is "Barrier-Barrier-Barrier" or "Cable-Cable-Cable."

2. Requested by military authority, e.g., airfield commander, supervisor of flying, mobile control officer, etc.

3. A military jet aircraft is landing with known or suspected radio failure or conditions (drag chute/hydraulic/electrical failure, etc.) that indicate an arresting system may be needed. Exceptions are authorized for military aircraft which cannot engage an arresting system (B738 etc.) and should be identified in a letter of agreement and/or appropriate military directive.

c. When requested by military authority due to freezing weather conditions or malfunction of the activating mechanism, the barrier/cable may remain in a raised position provided aircraft are advised.

PHRASEOLOGY-

YOUR DEPARTURE/LANDING WILL BE TOWARD/OVER A RAISED BARRIER/CABLE ON RUNWAY (number), (location, distance, as appropriate).

d. Inform civil and military aircraft whenever rubber supported cable are in place at the approach end of the landing runway, and include the distance of the cables from the threshold.

EXAMPLE:

"Runway One Four arresting cable three hundred meters from threshold."

e. When arresting system operation has been requested, inform the pilot of the indicated barrier/cable position.

PHRASEOLOGY:

(Identification), BARRIER/CABLE INDICATES UP/DOWN. CLEARED FOR TAKEOFF/TO LAND.

f. Time permitting advise pilots of the availability of all arresting systems on the runway in question when a pilot requests barrier information.

g. If an aircraft engages a raised barrier/cable, initiate crash alarm procedures immediately.

h. For preplanned practice engagements not associated with emergencies, crash alarm systems need not be activated if, in accordance with local military operating procedures, all required notifications are made before the practice engagement.

REFERENCE—

AERODROME CONDITIONS, Para 4-7-10.

Section 4. AERODROME LIGHTING

3-4-1 EMERGENCY LIGHTING

Whenever you become aware that an emergency has or will occur, take action to provide for the operation of all appropriate aerodrome lighting aids as required.

REFERENCE—
LIGHTING REQUIREMENTS, Para 9-4-2.

3-4-2 RUNWAY END IDENTIFIER LIGHTS

When separate on-off controls are provided, operate runway end identifier lights.

a. When the associated runway lights are lighted. Turn the REIL off after:
   1. An arriving aircraft has landed.
   2. A departing aircraft has left the traffic circuit area.
   3. It is determined that the lights are of no further use to the pilot.
b. As required by unit directives to meet aerodrome conditions.
c. As requested by the pilot.

3-4-3 VISUAL APPROACH SLOPE INDICATORS (VASI)

VASI systems with remote on-off switching shall be operated when they serve the runway in use and where intensities are controlled in accordance with the TBL 3-4-1 and TBL 3-4-2 except:

a. As required by unit directives to meet local conditions.
b. As required by the pilot.

TBL 3-4-1 VASI Intensity Setting Two Step System

STEP	PERIOD/CONDITION
High	Day-sunrise to sunset
Low	Night-sunset to sunrise

TBL 3-4-2 VASI Intensity Setting Three Step System

STEP	PERIOD/CONDITION
5, 4 (High)	Day-Sunrise to sunset.
3,2 (Medium)	Twilight-From sunset to 30 minutes after sunset and from 30 minutes before sunrise to sunrise
1 (Low)	Night-From 30 minutes after sunset to 30 minutes before sunrise

3-4-4 PRECISION APPROACH PATH INDICATORS (PAPI)

PAPI systems with remote on-off switching shall be operated when they serve the runway in use and where intensities are controlled in accordance with the TBL 3-4-3 except:

a. As required by unit directives to meet local conditions.
b. As required by the pilot.

TBL 3-4-3 PAPI Intensity Setting Five Step System	
STEP	**PERIOD/CONDITION**
5	On Pilot Request
4	Day – Sunrise to sunset
3	Night - Sunset to sunrise
2	On Pilot Request
1	On Pilot Request

3-4-5 APPROACH LIGHTS

Operate approach lights:

a. Between sunset and sunrise when one of the following conditions exists:

1. They serve the landing runway.
2. They serve a runway to which an approach is being made but aircraft will land on another runway.

b. Between sunrise and sunset when the ceiling is less than 1,000 feet or the visibility is 8 km or less and approaches are being made to:

1. A landing runway served by the lights.
2. A runway served by the lights but aircraft are landing on another runway.

c. As requested by the pilot.

d. As you deem necessary, if not contrary to pilot's request.

NOTE—
In the interest of energy conservation, the ALS should be turned off when not needed for aircraft operations.

REFERENCE—
ALS INTENSITY SETTINGS, Para 3-4-6.

3-4-6 ALS INTENSITY SETTINGS

When operating ALS as prescribed in para 3-4-5, APPROACH LIGHTS, operate intensity controls in accordance with the values in the TBL 3-4-4 except:

a. When unit directives specify other settings to meet local atmospheric, topographic, and twilight conditions.

b. As requested by the pilot.

c. As you deem necessary, if not contrary to pilot's request.

TBL 3-4-4 Visibility- (Applicable to runway served by lights)		
Step	**Day**	**Night**
5	Less than 1,500 m.	When requested
4	1,500 m to but not including 5km	When requested
3	5km to but not including 8 km	Less than 1,500 m.
2	8 km or more *	1,500 m to 5km inclusive
1	When requested	Greater than 5km
* 1. visibility is 8 km, or 2. visibility is more than 8 km and the ceiling is less than 1,000 feet.		

NOTE—

Day light Steps 2 and 3 provide recommended settings applicable to conditions in subparagraphs b. and c.

3-4-7 SEQUENCED FLASHING LIGHTS (SFL)

Operate Sequenced Flashing Lights:

NOTE—

SFL are a component of the ALS and cannot be operated when the ALS is off.

a. When the visibility is less than 5 km and instrument approaches are being made to the runway served by the associated ALS.

b. As requested by the pilot.

c. As you deem necessary if not contrary to pilot's request.

3-4-8 RUNWAY EDGE LIGHTS

Operate the runway edge light system/s serving the runway/s in use as follows:

a. Between sunset and sunrise turn the lights on:

1. For departures - Before an aircraft taxies onto the runway and until it leaves the Class C, Class D or Class E Surface airspace.

2. For arrivals-

(a) IFR aircraft- Before the aircraft begins final approach, or

(b) VFR aircraft- Before the aircraft enters the Class C, Class D or Class E Surface airspace, and

(c) Until the aircraft has taxied off the landing runway.

b. Between sunrise and sunset turn the lights on as shown in subparas a.1. and a.2. when the visibility is less than 3,000m.

c. As required by unit directives to meet local conditions.

d. Different from subparas a., b., or c. above, when:

1. You consider it necessary, or

2. Requested by a pilot and no other known aircraft will be adversely affected.

NOTE—

Pilots may request lights to be turned on or off contrary to subparas a. b. or c. However, operators are required to land/takeoff on lighted runways/heliport landing areas at night.

e. Do not turn on the runway edge lights when a NOTAM closing the runway is in effect.

NOTE—

Application concerns use for takeoffs/ landings/approaches and does not preclude turning lights on for use of unaffected portions of a runway for taxiing aircraft, surface vehicles, maintenance, repair. etc.

3-4-9 HIGH INTENSITY RUNWAY, RUNWAY CENTERLINE, AND TOUCHDOWN ZONE LIGHTS

Operate high intensity runway and associated runway centerline and touchdown zone lights in accordance with the TBL 3-4-5, except:

a. Where a unit directive specifies other settings to meet local conditions.

b. As requested by the pilot.

c. As you deem necessary, if not contrary to the pilot's request.

TBL 3-4-5 HIRL, RCLS, TDZL Intensity Setting		
Step	**Visibility**	
	Day	**Night**
5	Less than 1,500m. *	When requested
4	1,500m to but not including 3,000m	Less than 1,500m. *
3	3,000m to but not including 5 km	1,500m to but not including 5km. *
2	When requested	5 km to 8 km inclusive.
1	When requested	More than 8 km
* and/or appropriate RVR equivalent.		

3-4-10 HIRL ASSOCIATED WITH MALSR

Operate HIRL which control the associated MALSR in accordance with TBL 3−4−6, except:

a. As requested by the pilot.

b. As you deem necessary, if not contrary to the pilot's request.

TBL 3-4-6 HIRL Associated with MALSR		
Step	**Visibility**	
	Day	**Night**
5	Less than 1,500m. *	When requested
4	1,500m to but not including 3,000m	Less than 1,500m. *
3	3,000m to but not including 5 km	1,500m to but not including 5km. *
2	When requested	5 km to 8 km inclusive.
1	When requested	More than 8 km
* and/or appropriate RVR equivalent.		

NOTE—

When going from a given brightness step setting to a lower setting, rotation of the brightness control to a point below the intended step setting and then back to the appropriate step setting will ensure that the MALSR will operate at the appropriate brightness.

3-4-11 HIRL CHANGES AFFECTING RVR

Keep the appropriate approach controller or PAR controller informed, in advance if possible, of HIRL changes that affect RVR.

3-4-12 HIGH SPEED TURNOFF LIGHTS

Operate high speed turnoff lights:

a. Whenever the associated runway light are used for arriving aircraft. Leave them on until the aircraft has either entered a taxiway or passed the last light.

b. As required by unit directives to meet local conditions.

c. As requested by the pilot.

3-4-13 TAXIWAY LIGHTS

Operate taxiway lights serving the taxiways, or portions thereof, in use as follows:

a. Between sunset and sunrise - before an aircraft taxies onto the taxiway (normally at the time taxi information is issued) and until it taxies off it.

b. Between sunrise and sunset – when visibility is less than 1,500m.

c. Where required by unit directives to provide taxi guidance, taxiway lighting shall be turned on in such order that a continuous indication of the taxi path is presented to taxiing aircraft.

d. At other times when you consider it necessary or as required by unit directives to meet local conditions.

NOTE—

'Stop bar lights' are operated separately to taxiway lighting.'

3-4-14 OBSTRUCTION LIGHTS

If controls are provided, turn the lights on between sunset and sunrise.

3-4-15 AERODROME BEACON

When air traffic control services are provided, turn the aerodrome beacon on:

a. Between sunset and sunrise.

b. Between sunrise and sunset:

1. when the reported ceiling or visibility is below basic VFR minima or
2. as controllers or pilots deem necessary, or
3. as required by SOP/unit directives.

3-4-16 RUNWAY GUARD LIGHTS

A light system intended to caution pilots or vehicle drivers that they are about to enter an active runway. If the runway is in use, the runway guard lights shall be turned on.

3-4-17 STOP BARS

Operate stop bars as required by unit directives.

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Section 5. RUNWAY SELECTION

3-5-1 SELECTION

a. Selection of runway-in-use:

1. The term “runway-in-use” shall be used to indicate the runway or runways that, at a particular time, are considered by the aerodrome control tower to be the most suitable for use by the types of aircraft expected to land or take off at the aerodrome.

NOTE—

Separate or multiple runways may be designated runway-in-use for arriving aircraft and departing aircraft.

2. Normally, an aircraft will land and take off into wind unless safety, the runway configuration, meteorological conditions and available instrument approach procedures or air traffic conditions determine that a different direction is preferable. In selecting the runway-in-use, however, the unit providing aerodrome control service shall take into consideration, besides surface wind speed and direction, other relevant factors such as the aerodrome traffic circuits, the length of runways, and the approach and landing aids available.

3. If the runway-in-use is not considered suitable for the operation involved, the flight crew may request permission to use another runway and, if circumstances permit, should be cleared accordingly.

b. Except otherwise specified, use the runway most nearly aligned with the wind when 5 knots or more or the "calm wind" runway when less than 5 knots unless use of another runway:

1. Will be operationally advantageous.

2. Is requested by the pilot. If a pilot prefers to use a runway different from that specified, the pilot is expected to advise ATC. ATC may honor such requests as soon as is operationally practicable.

c. When conducting aircraft operations on other than the advertised runway-in-use, state the runway in use.

3-5-2 TAILWIND COMPONENTS

When authorizing use of runways and a tailwind component exists, always state both wind direction and velocity.

NOTE—

The wind may be described as "calm" when appropriate.

REFERENCE—

CALM WIND CONDITIONS, Para 2-6-5.

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Section 6. AERODROME SURFACE DETECTION PROCEDURES

Note—

"Aerodrome Surface Detection Equipment (ASDE)" contained in this ATMP is a general term to mean a system/equipment that uses surface movement radar, multilateration sensor and/or ADS-B sensor. Data from these sources are fused and presented on a digital display.

3-6-1 EQUIPMENT USAGE

Use ASDE to augment visual observation of aircraft and/or vehicular movements on runways and taxiways, or other areas of the maneuvering area:

a. When visibility is less than the most distant point in the active maneuvering area, and

b. When, in your judgment, its use will assist you in the performance of your duties at any time.

c. ASDE shall be operated continuously between sunset and sunrise regardless of visibility.

3-6-2 INFORMATION USAGE

Use ASDE derived information to assist in:

a. Monitoring of aircraft and vehicles on the maneuvering area for compliance with clearances and instructions.

b. Determining that a runway is clear of traffic prior to a landing or take-off.

c. Providing information on essential local traffic on or near the maneuvering area.

d. Determining the location of aircraft and vehicles on the maneuvering area.

e. Providing directional taxi information to aircraft when requested by the pilot or deemed necessary by the controller; except under special circumstances, e.g., emergencies, do not provide such information in the form of specific heading instructions.

f. Providing assistance and advice to emergency vehicles.

REFERENCE—

TAXI AND GROUND MOVEMENT OPERATIONS, Para 3-7-2.

3-6-3 IDENTIFICATION

To identify an observed target on the ASDE display, correlate its position with one or more of the following:

a. Pilot/vehicle operator position report.

b. Controller's visual observation.

c. An identified target observed on the ASR or tower radar display.

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Section 7. TAXI AND MOVEMENT PROCEDURES

3-7-1 GROUND TRAFFIC MOVEMENT

Issue by radio, or directional light signals, specific instructions which approve, or disapprove the movement of aircraft, vehicles, equipment, or personnel on the maneuvering area except where permitted in an LOA:

a. Do not issue *conditional* instructions that are dependent upon the movement of an arrival aircraft on or approaching the runway or a departure aircraft established on a take-off roll. Do not say *LINE UP BEHIND LANDING TRAFFIC* or *TAXI/PROCEED ACROSS RUNWAY THREE SIX BEHIND DEPARTING/LANDING JETSTAR*. These requirements do not preclude issuing instructions to follow an aircraft observed to be operating on the maneuvering area in accordance with an ATC clearance/instruction and in such a manner that the instructions to follow are not ambiguous.

b. Do not issue unconditional instructions when authorizing movement on a runway/taxiway for the purpose of airfield checks or other aerodrome operations. Instructions must ensure positive control with specific instructions to proceed on a runway or maneuvering area, and as necessary, hold short instructions.

REFERENCE—

TAXI AND GROUND MOVEMENT OPERATIONS, Para 3-7-2.

EXAMPLE -

"Aerodrome 1 proceed on taxi way B, hold short of Runway 18L."

"Aerodrome 1 proceed on Runway 23R (additional instructions as necessary)."

NOTE—

1. *The following are examples of unconditional instructions and are not approved for use: "THE FIELD IS YOURS," "CLEARED ON ALL SURFACES," "THE AERODROME IS YOURS," and "PROCEED ON ALL RUNWAYS AND TAXIWAYS."*

2. *"PROCEED AS REQUESTED" is not approved phraseology for instructing aircraft, vehicles, equipment, or personnel to cross or operate on a runway.*

c. Do not use the word *CLEARED* in conjunction with authorization for aircraft to taxi or equipment/vehicle/personnel operations. Use prefix *TAXI, PROCEED*, or *HOLD*, as appropriate, for aircraft instructions. Use *PROCEED, HOLD,* or *TOW APPROVED* for equipment/vehicles/personnel.

d. Intersection departures may be initiated by a controller or a controller may authorize an intersection departure if a pilot requests. Issue the measured distance from the intersection to the runway end rounded "down" to the nearest 15 meters/50 feet to any pilot, unless use of the intersection is covered in AIP.

PHRASEOLOGY−

RUNWAY (number) AT (taxiway designator) INTERSECTION DEPARTURE (remaining length) FEET/METERS AVAILABLE.

REFERENCE—

Line Up and Wait, Para 3−9−5.

e. Do not use the term "full length" when the runway length available for departures has been temporarily shortened. On permanently shortened runways, do not use the term "full length" until the Aeronautical Information Publication (AIP) is updated to include the change(s).

3-7-2 TAXI AND GROUND MOVEMENT OPERATIONS

Issue the route for the aircraft/vehicle to follow on the maneuvering area in concise and easy to understand terms. The taxi clearance must include the specific route to follow. When a taxi clearance to a runway is issued

to an aircraft, confirm the aircraft has the correct runway assignment.

NOTE—

1. *A pilot's read back of taxi instructions with the runway assignment can be considered confirmation of runway assignment.*

2. *Movement of aircraft or vehicles on non-maneuvering areas is the responsibility of the pilot, the aircraft operator, or the aerodrome management.*

a. When authorizing an aircraft/vehicle to proceed on the maneuvering area or to any point other than assigned takeoff runway, specify the route/taxi instructions, including specific instructions on where to cross a runway. If it is the intent to hold the aircraft/vehicle short of any given point along the taxi route, issue the route and then state the holding instructions.

NOTE—

The absence of holding instructions authorizes an aircraft/vehicle to cross all taxiways that intersect the taxi route.

PHRASEOLOGY−

HOLD POSITION.

HOLD FOR (reason)

CROSS (taxiway)

Or

TAXI/CONTINUE TAXIING/PROCEED/VIA (route),

or

ON (runway number or taxiways, etc.),

or

TO (location),

or

(direction),

or

ACROSS/CROSS RUNWAY (number), at (runway/taxiway).

VIA (route), HOLD SHORT OF (location)

or

FOLLOW (traffic) (restrictions as necessary)

Or

BEHIND (traffic).

EXAMPLE−

"Cross Runway Two−Eight Left, at taxiway Alfa, hold short of Runway Two−Eight Right."

"Taxi/continue taxiing/proceed to the hangar."

"Taxi/continue taxiing/proceed straight ahead then via ramp to the hangar."

"Taxi/continue taxiing/proceed on Taxiway Charlie, hold short of Runway Two−Seven."

or

"Taxi/continue taxing/proceed on Charlie, hold short of Runway Two−Seven."

b. When authorizing an aircraft to taxi to an assigned takeoff runway, state the departure runway followed

by the specific taxi route. Issue hold short restrictions when an aircraft will be required to hold short of a runway or other points along the taxi route.

PHRASEOLOGY−

RUNWAY (number), TAXI VIA (route as necessary).

or

RUNWAY (number), TAXI VIA (route as necessary)(hold short instructions as necessary).”

EXAMPLE−

“Runway Three−Six Left, taxi via taxiway Alfa, hold short of taxiway Charlie.”

or

“Runway Three−Six Left, taxi via Alfa, hold short of Charlie.”

or

“Runway Three−Six Left, taxi via taxiway Alfa, hold short of Runway Two−Seven Right.”

or

“Runway Three−Six Left, taxi via Charlie, cross Runway Two−Seven Left, hold short of Runway Two−Seven Right.”

or

“Runway Three−Six Left, taxi via Alfa, Charlie, cross Runway One−Zero.”

c. Aircraft/vehicles must receive a clearance for each runway their route crosses. An aircraft/vehicle must have crossed a previous runway before another runway crossing clearance may be issued.

NOTE—

A clearance is required for aircraft/ vehicles to operate on any active, inactive, or closed runway except for vehicles operating on closed runways in accordance with a Letter of Agreement (LOA).

EXAMPLE−

“Cross Runway One−Six Left at Taxiway Bravo, hold short of Runway One−Six Right.”

d. When an aircraft/vehicle is instructed to “follow” traffic and requires a runway crossing, issue a runway crossing clearance in addition to the follow instructions and/or hold short instructions, as applicable.

EXAMPLE−

“Follow (traffic), cross Runway Two−Seven Right, at Taxiway Whiskey.”

or

“Follow (traffic), cross Runway Two Seven−Right at Taxiway Whiskey, hold short Runway Two−Seven Left.”

e. Request a read back of runway hold short instructions when it is not received from the pilot/vehicle operator.

PHRASEOLOGY−

READ BACK HOLD INSTRUCTIONS.

EXAMPLE−

“Glory eight zero four, Runway Three Six Left, taxi via taxiway Charlie, hold short of Runway Two Seven Right.”

Or

1. “Glory eight zero four, Runway Three Six Left, taxi via Charlie, hold short of Runway Two Seven Right.”

"Glory eight zero four, Roger."

"Glory eight zero four, read back hold instructions."

2. *"Songshan Tower, Dynasty two zero two is ready for departure."*

"Dynasty two zero two, hold short of Runway Two Three Left, traffic one mile final."

"Dynasty two zero two, Roger."

"Dynasty two zero two, read back hold instructions."

3. *"Cathay four five one, proceed via taxiway Charlie hold short of Runway Two Seven."*

or

"Cathay four five one, proceed via Charlie hold short of Runway Two Seven."

"Cathay four five one, Roger."

"Cathay four five one, read back hold instructions."

NOTE—

Read back hold instructions phraseology may be initiated for any point on a maneuvering area when the controller believes the read back is necessary.

f. Issue progressive taxi/ground movement instructions when:

1. A pilot/operator requests.

2. The controller deems it necessary due to traffic or field conditions, e.g., construction or closed taxiways.

3. Necessary during reduced visibility, especially when the taxi route is not visible from the tower.

NOTE—

Progressive instructions may include step−by−step directions and/or directional turns.

REFERENCE—

Runway Proximity, Para 3−7−4.

Taxi and Ground Movement Operation, Para 3−11−1.

g. Issue instructions to expedite a taxiing aircraft or a moving vehicle.

PHRASEOLOGY−

EXPEDITE TAXI [(reason)].

h. Crossing of active runway(s) by aircraft/vehicle(s):

1. During departure operations, ensure that aircraft/vehicles intending to cross a runway do not cross the runway holding position markings until the controller visually observes the departure aircraft in a turn, or the departure aircraft has passed the point where the crossing aircraft/vehicle is located, regardless of altitude, unless authorized in paragraph 3−10−10, LEVEL RESTRICTED LOW APPROACH.

REFERENCE—

LEVEL RESTRICTED LOW APPROACH, Para 3−10−10

2. During arrival operations, ensure the following:

(a) An aircraft/vehicle has completed crossing prior to an arriving aircraft crossing the landing threshold, or

REFERENCE—

Attachment. Pilot/Controller Glossary—Clear of the Runway

(b) An aircraft/vehicle shall not cross the runway holding position markings until an arriving aircraft has landed and either:

(1) The controller visually observes the aircraft exiting the runway prior to the point at which the crossing is intended, or

(2) The arriving aircraft has passed the point at which the crossing is intended.

3-7-3 GROUND OPERATIONS

WAKE TURBULENCE APPLICATION

Avoid clearances which require:

a. SUPER or HEAVY aircraft to use greater than normal taxiing power.

b. LIGHT aircraft or helicopters to taxi in close proximity to taxing or air-taxi helicopters.

3-7-4 RUNWAY PROXIMITY

Hold a taxing aircraft or vehicle clear of the runway as follows:

a. Instruct aircraft or vehicle to hold short of a specific runway.

b. Instruct aircraft or vehicle to hold at a specified point.

c. Issue traffic information as necessary.

PHRASEOLOGY-

HOLD SHORT OF/AT (runway number or specific point), (traffic or other information).

d. Use of runway-holding position, except as prescribed by the appropriate ATS authority, aircraft shall not be held closer to a runway-in-use than at a runway holding position.

NOTE—

①.Establishing holding points/signs is the responsibility of the aerodrome operator. While pilots, drivers and equipment operators are responsible for properly positioning the aircraft, vehicle, or equipment at the appropriate holding points/signs, or the equivalent distance from the runway if not on a taxiway, in accordance with air traffic control instructions, the requirements in para 3-1-1, FUNCTIONS OF AERODROME CONTROL TOWERS, and 3-1-4 CONTROL OF OTHER THAN AIRCRAFT TRAFFIC remain applicable.

②.Runway-holding position locations in relation to runway are specified in Civil Aerodrome Design and Operation Standards.

REFERENCE—

TAXI AND GOURND MOVEMENT OPERATION, Para 3-7-2.

LEVEL RESTRICTED LOW APPROACH, Para 3-10-10.

SEPARATION MINIMA, Para 6-3-1.

3-7-5 PRECISION APPROACH CRITICAL AREA

a. ILS critical area dimensions are described in FIG 3-7-1, FIG 3-7-2. Aircraft and vehicle access to the ILS critical area must be controlled to ensure the integrity of ILS track signals whenever conditions are less than reported ceiling 800 feet or visibility less than 3,000 meters. Do not authorize vehicles/aircraft to operate in or over the critical area, except as specified in subpara a.1., whenever an arriving aircraft is inside the ILS FAF unless the arriving aircraft has reported the runway in sight or is circling to land on another runway. If an ILS critical area is marked and identifiable, provide information as follows when the ILS is being used for approach/landing guidance.

NOTE—

① Restrictions to the operation of aircraft and vehicles are required to assure the integrity of ILS track signals and to meet obstacle clearance needs. Aerodrome operators are responsible for installing and maintaining

appropriate signs and markings delineating taxi lanes, hold lines, and no parking areas associated with ILS critical areas.

② *For holding purpose no point along the longitudinal axis of the aircraft is permitted past the hold line.*

PHRASEOLOGY:

HOLD SHORT OF (runway) ILS CRITICAL AREA.

1. LOCALIZER CRITICAL AREA

(a) Do not authorize vehicle or aircraft operations in or over the area (as shown in FIG 3-7-1) when an arriving aircraft is inside the ILS FAF -when conditions are less than reported ceiling 800 feet or visibility 3,000 meters, except:

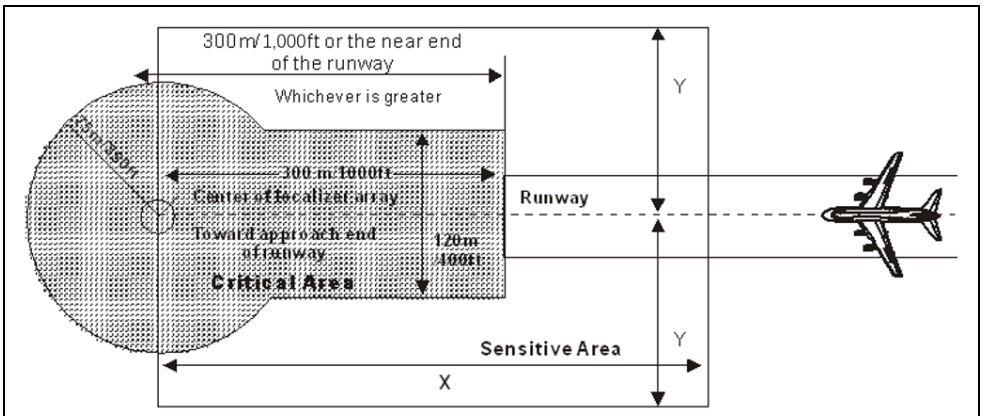
(1) A preceding arriving aircraft on the same or another runway that passes over or through the area while landing or exiting the runway.

(2) A preceding departing aircraft or missed approach on the same or another runway that passes through or over the area.

(b) In addition to subpara a. l.(a), do not authorize vehicles or aircraft operations in or over the area when an arriving aircraft is inside the MAP when conditions are less than reported ceiling 200 feet or RVR 600 meters.

NOTE—
Critical and sensitive area, objects in front of and near to the antennas can cause in-beam multipath or signal shadowing.

FIG 3-7-1 **Typical localizer critical and sensitive areas**



Sensitive Area (X,Y) 1,000

Category I	Category II/III
X 300-600 m / 1,000-2,000 ft	X 300-2,750 m / 1,000-9,000 ft
Y 60-110 m / 200-350 ft	Y 60-210 m / 200-700 ft

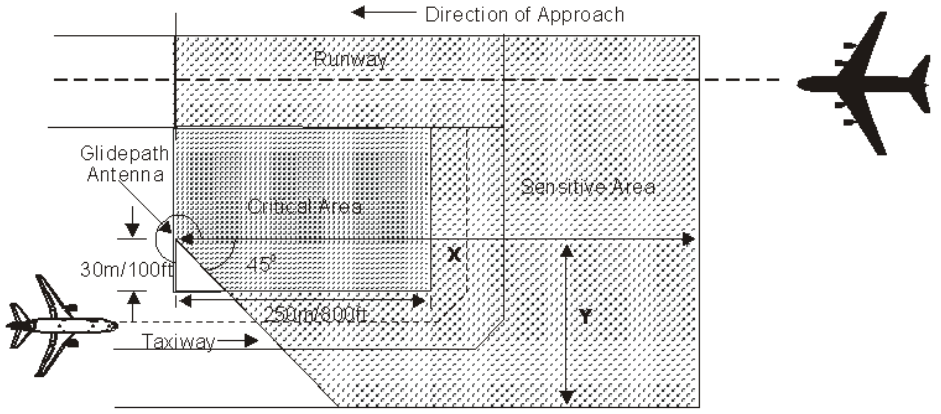
Note—

The sensitive varies with localizer type and antenna aperture.

2. GLIDESLOPE CRITICAL AREA

Do not authorize vehicles or aircraft operations in or over the area (as shown in FIG 3-7-2) when an arriving aircraft is inside the ILS FAF, unless the arriving aircraft has reported the runway in sight or is circling to land on another runway when conditions are less than reported ceiling 800 feet or visibility less than 3,000 meter.

FIG 3-7-2 **Typical glide path critical and sensitive areas**



Sensitive Area (X,Y)

	Category I	Category II/III
X	250-915 m / 800-3,000 ft	250-975 m / 800-3,200 ft
Y	30-60 m / 100-200 ft	30-90 m / 100-300 ft

Note—

The glideslope critical area extends to the near edge of the runway that the ILS serves. It does not include the runway.

b. Operators commonly conduct “coupled” or “autoland” approaches to satisfy maintenance, training, or reliability program requirements. Promptly issue an advisory if the critical area will not be protected when an arriving aircraft advises that a “coupled,” “CAT III”, “autoland,” or similar type approach will be conducted and the weather indicates a reported ceiling of 800 feet or more, and the visibility is 3000 meters or more.

PHRASEOLOGY:

ILS CRITICAL AREA NOT PROTECTED.

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Section 8. SPACING AND SEQUENCING

3-8-1 SEQUENCE/SPACING APPLICATION

Establish the sequence of arriving and departing aircraft by requiring them to adjust flight or ground operation as necessary to achieve proper spacing. When more than one runway is in use, state the runway number with runway clearances.

PHRASEOLOGY:

LINE UP AND WAIT [RUNWAY (number)]

VACATE RUNWAY

[RUNWAY (number)] CLEARED FOR [IMMEDIATE] TAKE-OFF

TAKE-OFF IMMEDIATELY OR VACATE THE RUNWAY

HOLD POSITION, CANCEL TAKE-OFF, I SAY AGAIN, CANCEL TAKE-OFF

STOP IMMEDIATELY [(repeat aircraft call sign) STOP IMMEDIATELY]

EXTEND DOWNWIND.

MAKE SHORT APPROACH.

NUMBER (landing sequence number).

FOLLOW (description and location of traffic),

or if traffic is utilizing another runway,

TRAFFIC (description and location) LANDING RUNWAY (number of runway being used).

CIRCLE THE AERODROME.

MAKE LEFT / RIGHT THREE-SIXTY/TWO SEVENTY.

MAKE (number) ORBIT LEFT/RIGHT [reason]

EXAMPLE:

"Make one orbit right due traffic"

GO AROUND.

[RUNWAY (number)] CLEARED TO LAND.

[RUNWAY (number)] CLEARED:

TOUCH-AND-GO,

or

STOP-AND-GO,

or

LOW APPROACH,

[RUNWAY (number)] CLEARED FOR THE OPTION,

or

OPTION APPROVED,

or

UNABLE OPTION, (alternate instructions).

or

UNABLE (type of option), OTHER OPTIONS APPROVED.

NOTE—

① *The "Cleared for the Option" procedure will permit an instructor pilot/flight examiner/pilot the option to make a touch-and-go, low approach, missed approach, stop-and-go, or full stop landing. This procedure will only be used at those locations with an operational control tower and will be subject to ATC approval. After ATC approval of the option, the pilot should inform ATC as soon as possible of any delay on the runway during their stop-and-go or full stop landing.*

② *For proper helicopter spacing, speed adjustments may be more practical than track changes.*

③ *Read back of hold short instructions apply when hold instructions are issued to a pilot in lieu of a takeoff clearance.*

REFERENCE—

TAXI AND GROUND MOVEMENT OPERATIONS, Para 3-7-2.

3-8-2 TOUCH-AND-GO OR STOP-AND-GO OR LOW APPROACH

Consider an aircraft cleared for touch-and-go, stop-and-go, or low approach as an arriving aircraft until it touches down (for touch-and-go), or makes a complete stop (for stop-and-go), or crosses the landing threshold (for low approach), and thereafter as a departing aircraft.

REFERENCE—

CONTROL OF OTHER THAN AIRCRAFT TRAFFIC, Para 3-1-4.

WAKE TURBULENCE SEPARATION FOR INTERSECTION DEPARTURES, Para 3-9-8.

3-8-3 SIMULTANEOUS SAME DIRECTIONS OPERATION

Authorize simultaneous, same direction operations on parallel runways, only when the following conditions are met:

a. Operations are conducted in VFR conditions unless visual separation is applied.

b. Two-way radio communication is maintained with the aircraft involved and pertinent traffic information is issued.

c. The distance between the runways is in accordance with the minima in TBL 3-8-1 (use the greater minimum if two categories are involved).

TBL 3-8-1 Same Direction Distance Minima

Aircraft Category	*Minimum distance (meters/feet) between parallel*
	Runway centerlines
Lightweight, single engine, propeller driven	120/400
Twin-engine, propeller driven	150/500
All others	210/700

3-8-4 SIMULTANEOUS OPPOSITE DIRECTION OPERATION

Authorize simultaneous opposite direction operations on parallel runways only when the following conditions are met:

a. Operations are conducted in VFR conditions.

b. Two-way radio communication is maintained with the aircraft involved and pertinent traffic information is issued.

PHRASEOLOGY:

TRAFFIC (description) ARRIVING/DEPARTING/LOW APPROACH, OPPOSITE DIRECTION ON PARALLEL RUNWAY

c. The distance between the runways is in accordance with the minima in TBL 3-8-2.

TBL 3-8-2 Opposite Direction Distance Minima

Time of operation	*Minimum distance (meters/feet) between parallel*
	Runway centerlines
Between sunrise and sunset	427/1,400
Between sunset and sunrise	854/2,800

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Section 9. DEPARTURE PROCEDURES AND SEPARATION

3-9-1 DEPARTURE INFORMATION

Prior to taxiing for take-off, aircraft shall be advised of the following elements of information, in the order listed, with the exception of such elements which it is known the aircraft has already received:

NOTE—

Unless the military authority has specified.

a. The runway to be used;

b. The surface wind direction and speed, including significant variations therefrom;

c. The QNH altimeter setting and, either on a regular basis in accordance with local arrangements or if so requested by the aircraft, the QFE altimeter setting;

REFERENCE—

CURRENT SETTINGS, Para 2-7-1

d. The air temperature for the runway to be used, in the case of turbine-engined aircraft;

e. The visibility, if less than 10 km, or, when applicable, the RVR value(s) for the runway to be used;

f. Provide the correct time as described in para 4-3-3, or upon pilot's request.

g. Taxi information, as necessary. You need not issue taxi route information unless the pilot specifically requests it.

h. Runway Condition Report (RCR). Furnish RCR, as received from the aerodrome operator, to aircraft via the ATIS.

i. For opposite direction departure operations, controllers may verbally issue the RWYCC, as identified in the RCR, in reverse order. Controllers must not include reversed RCR information on the ATIS broadcast.

3-9-2 UPDATING DEPARTURE INFORMATION

Prior to take-off, advise aircraft of:

a. Any significant change in the wind direction and speed, the air temperature, and the visibility or RVR value; and

NOTE—

If the controller possesses wind information in the form of components, the significant changes are:

① Mean head-wind component: 10 kts

② Mean tail-wind component: 2 kts

③ Mean cross –wind component: 5 kts

b. Significant meteorological conditions in the take-off area, except when it is known that the information has already been received by the aircraft.

NOTE—

Significant meteorological conditions in this context include the occurrence or expected occurrence of cumulonimbus or thunderstorm, moderate or severe turbulence, wind shear, hail, moderate or severe icing, wind squall line, freezing precipitation, severe mountain waves, sand storm, dust storm, blowing snow, tornado or water spout, in the take-off and climb out area.

3-9-3 DEPARTURE DELAY INFORMATION

Issue the following departure delay information as appropriate:

a. Advise departing aircraft the time at which the pilot can expect to receive engine startup advisory.

PHRASEOLOGY:

EXPECT ENGINE START/PUSHBACK/TAXI (time).

b. Advise departing aircraft when to start engines, or to pushback, and/or to advise when ready to taxi.

PHRASEOLOGY:

START UP APPROVED, ADVISE WHEN READY TO PUSHBACK / TAXI,

or

*ADVISE WHEN READY TO TAXI***.**

c. If the pilot requests to hold in a delay absorbing area, the request shall be approved if space and traffic conditions permit.

3-9-4 DEPARTURE CONTROL INSTRUCTIONS

Inform departing IFR, SVFR, VFR aircraft receiving radar service, of the following:

a. Before takeoff-

1. Issue the appropriate departure control frequency and beacon code. The departure control frequency may be omitted if a SID has been or will be assigned and the departure control frequency is published on the SID.

PHRASEOLOGY:

DEPARTURE FREQUENCY WILL BE (frequency), SQUAWK (code).

2. Inform all departing IFR military turboprop/turbojet aircraft (except transport and cargo types) to change to departure control frequency. If the aerodrome controller has departure frequency override, transmit urgent instructions on this frequency. If the override capability does not exist, transmit urgent instructions on the emergency frequency.

PHRASEOLOGY:

CHANGE TO DEPARTURE.

b. After takeoff-

1. When the aircraft is about 1/2 mile beyond the runway end, instruct civil aircraft and military transport and cargo types to contact departure control provided further communication with you is not required.

2. Do not request departing military turboprop/turbojet aircraft (except transport and cargo types) to make radio frequency or radar beacon changes before the aircraft reaches 2,500 feet above the surface.

REFERENCE—

VISUAL SEPARATION, Para 7-2-1.

3-9-5 LINE UP AND WAIT (LUAW)

a. The intent of LUAW is to position aircraft for an imminent departure. Authorize an aircraft to line up and wait, except as restricted in subpara h, when takeoff clearances cannot be issued because of traffic. Issue traffic information to any aircraft so authorized. Traffic information may be omitted when the traffic is another aircraft which has landed on or is taking off the runway and is clearly visible to the holding aircraft. Do not use conditional phrases such as “behind landing traffic” or “after the departing aircraft.”

b. First issue the line up and wait clearance followed by the runway number.

PHRASEOLOGY:

LINE UP, RUNWAY (number).

EXAMPLE:

"Line up, Runway 05L."

LINE UP AND WAIT, RUNWAY (number).

EXAMPLE:

"Line up and wait, Runway 05L."

LINE UP AND WAIT, RUNWAY (number) [(additional instruction)]..

EXAMPLE:

"Line up and wait, Runway 05L, due to flow control expect 3 minutes delay"

NOTE—

①LINE UP-

No delay is expected but take-off clearance cannot be issued immediately.

②LINE UP AND WAIT-

The aircraft is required to hold on the runway.

c. Procedures.

1. Do not clear an aircraft for a full−stop, touch−and−go, stop−and−go, low approach, or option on the same runway with an aircraft holding in position or taxiing to LUAW until the aircraft in position has exited the runway or starts takeoff roll.

PHRASEOLOGY:

*RUNWAY (number), CONTINUE, TRAFFIC HOLDING IN POSITION***.**

or

RUNWAY (number) (pattern instructions as appropriate) TRAFFIC HOLDING IN POSITION.

EXAMPLE:

"Japan air eight one one, Runway zero niner, continue, traffic holding in position."

"Alfa Tango five one, Runway one eight left, base approved, traffic holding in position."

"Eva training one, Runway zero five left, extend downwind, tower will call your base, traffic holding in position."

2. Do not authorize an aircraft to LUAW if an aircraft has been cleared for a full−stop, stop−and–go, low approach, or option on the same runway.

REFERENCE—

SAME RUNWAY SEPARATION, Para 3-10-4.

d. When an aircraft is authorized to LUAW, inform it of the closest traffic within 6-flying miles requesting a full−stop, touch−and−go, stop−and− go, low approach, or option to the same runway.

EXAMPLE:

"Dynasty Zero Zero Six, line up and wait, Runway One Zero. Traffic a Boeing Seven Thirty Seven, six mile final."

e. ***Military*****:** When an aircraft is authorized to line up and wait, inform it of the closest traffic within 6 miles on final approach to the same runway. If the approaching aircraft is on a different frequency, inform it of the aircraft taxiing into position.

f. Do not authorize an aircraft to line up and wait when the departure point is not visible from the tower, unless the aircraft's position can be verified by ASDE or any comparable ground-based system that enables the identification of aircraft or the runway is used for departures only.

REFERENCE—

AERODROME SURFACE DETECTION PROCEDURES, Chapter 3, section 6.

g. An aircraft may be authorized to line up and wait at an intersection between sunset and sunrise under the following conditions:

1. The procedure must be approved by the appropriate authority.
2. The procedure must be contained in a unit directive.
3. The runway must be used as a departure−only runway.
4. Only one aircraft at a time is permitted to line up and wait on the same runway.

h. Do not authorize an aircraft to line up and wait at anytime when the intersection is not visible from the tower.

i. When an aerodrome controller delivers or amends an ATC clearance to an aircraft awaiting departure and that aircraft is holding short of a runway or is holding in position on a runway, an additional clearance shall be issued to prevent the possibility of the aircraft inadvertently taxiing onto the runway and/or beginning takeoff roll. In such cases, append one of the following ATC instructions as appropriate:

PHRASEOLOGY:

HOLD SHORT OF RUNWAY

or,

HOLD *POSITION*

j. **Military:** When issuing additional instructions or information to an aircraft holding in takeoff position, include instructions to continue holding or taxi off the runway, unless it is cleared for takeoff.

PHRASEOLOGY:

CONTINUE HOLDING,

or

VACATE THE RUNWAY.

REFERENCE—

Level Restricted Low Approach, Para 3−10−10.

k. When authorizing an aircraft to line up and wait at an intersection, state the runway intersection.

PHRASEOLOGY:

LINE UP AND WAIT, RUNWAY (number) AT (taxiway designator).

l. When two or more aircraft call the tower ready for departure, one or more at the full length of a runway and one or more at an intersection, state the location of the aircraft at the full length of the runway when authorizing that aircraft to line up and wait.

PHRASEOLOGY:

LINE UP AND WAIT, RUNWAY (number), FULL−LENGTH.

EXAMPLE:

"Dynasty Zero Zero Six, line up and wait, Runway Zero−Five Left, full length."

NOTE—

The controller need not state the location of the aircraft departing the full length of the runway if there are no aircraft holding for departure at an intersection for that same runway.

m. Do not use the term "full length" when the runway length available for departure has been temporarily shortened. On permanently shortened runways, do not use the term "full length" until the AIP is updated to include the change(s).

NOTE—

The use of the term "full length" could be interpreted by the pilot(s) as the available runway length prior to the runway being shortened.

n. Whenever a runway length has been temporarily or permanently shortened, state the word "shortened" immediately following the runway number as part of the line up and wait clearance.

1. The addition of "shortened" must be included in the line up and wait clearance for the duration of the construction project when the runway is temporarily shortened.

2. The addition of "shortened" must be included in the line up and wait clearance until the AIP is updated to include the change(s) when the runway is permanently shortened.

PHRASEOLOGY:

LINE UP AND WAIT, RUNWAY (number) SHORTENED.

EXAMPLE:

"Line up and wait, Runway Two-Seven shortened."

3-9-6 ANTICIPATING SEPARATION

Takeoff clearance needs not be withheld until prescribed separation exists if there is a reasonable assurance it will exist when the aircraft starts takeoff roll.

NOTE—

Clear of the Runway-

An aircraft is clear of the runway when all parts of the aircraft are held short of, the applicable runway holding position marking or when exiting the runway, have crossed the applicable runway holding position marking.

3-9-7 SAME RUNWAY SEPARATION

Separate a departing aircraft from a preceding departing or arriving aircraft using the same runway by ensuring that it does not begin takeoff roll until:

a. The other aircraft has departed and crossed the runway end or turned to avert any conflict (see FIG 3-9-1)

b. A preceding landing aircraft is clear of the runway (see FIG 3-9-2).

FIG 3-9-1

Same Runway Separation

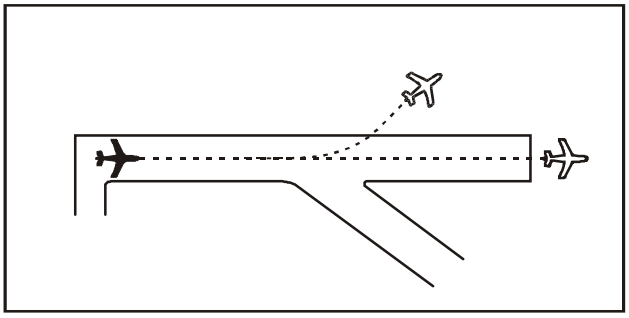
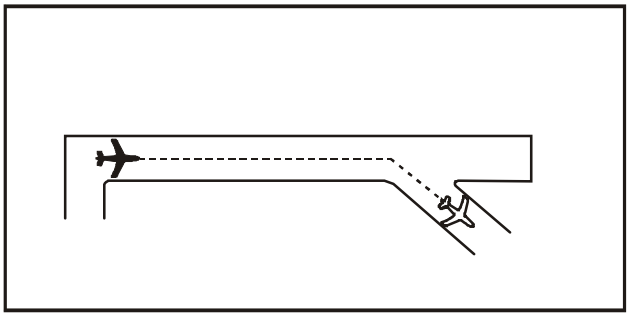


FIG 3-9-2

Preceding Landing Aircraft Clear of Runway



WAKE TURBULENCE APPLICATION

c. Do not issue clearances which imply or indicate approval of rolling take-offs by SUPER or HEAVY aircraft.

d. Do not issue clearances to a LIGHT aircraft to line up and wait on the same runway behind a departing SUPER or HEAVY aircraft.

e. The minima in para 5-5-4, MINIMA, may be applied in lieu of the time interval requirement in subpara f, g, and h. When the 5-5-4, MINIMA, is applied, ensure that the appropriate radar separation exists at or prior to the time an aircraft becomes airborne.

NOTE—

The pilot may request additional separation, but should make this request before entering the runway.

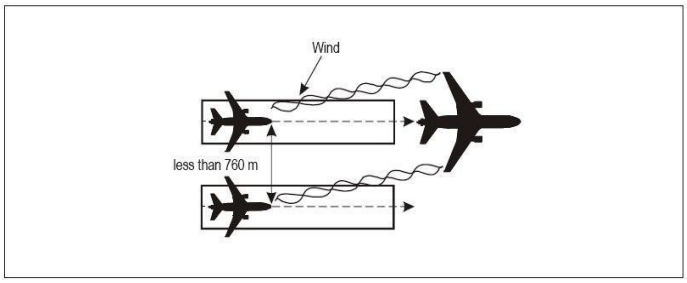
f. When using wake turbulence categories contained in para 2-1-20 a. and when the aircraft are using:

the same runway (see FIG 3-9-3);

parallel runways separated by less than 760 m (2,500 ft) (see FIG 3-9-3); the following minimum separations shall be applied

1. HEAVY aircraft taking off behind a SUPER aircraft — 2 minutes;
2. LIGHT or MEDIUM aircraft taking off behind a SUPER aircraft — 3 minutes;
3. LIGHT or MEDIUM aircraft taking off behind a HEAVY aircraft — 2 minutes;
4. LIGHT aircraft taking off behind a MEDIUM aircraft— 2 minutes.

FIG 3-9-3
Wake turbulence separation for following aircraft



g. When using wake turbulence categories contained in para 2-1-20 a. and when operating a displaced landing threshold, the following minimum separations shall be applied if the projected flight paths are expected to cross:

1. a departing HEAVY aircraft following a SUPER aircraft arrival — 2 minutes;
2. a departing LIGHT or MEDIUM aircraft following a SUPER aircraft arrival — 3 minutes;
3. a departing LIGHT or MEDIUM aircraft following a HEAVY aircraft arrival — 2 minutes;
4. a departing LIGHT aircraft following a MEDIUM aircraft arrival — 2 minutes;
5. a HEAVY aircraft arrival following a SUPER aircraft departure — 2 minutes;
6. a LIGHT or MEDIUM aircraft arrival following a SUPER aircraft departure — 3 minutes;

7. a LIGHT or MEDIUM aircraft arrival following a HEAVY aircraft departure — 2 minutes;

8. a LIGHT aircraft arrival following a MEDIUM aircraft departure — 2 minutes.

h. When using wake turbulence categories contained in para 2-1-20 a. for a heavier aircraft making a low or missed approach and when the lighter aircraft is:

using an opposite-direction runway for take-off (see FIG 3-9-4); or

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) (see FIG 3-9-5);

the following minimum separations shall be used:

1.between a HEAVY aircraft and a SUPER aircraft — 3 minutes;

2.between a LIGHT or MEDIUM aircraft and a SUPER aircraft — 4 minutes;

3.between a LIGHT or MEDIUM aircraft and a HEAVY aircraft — 3 minutes;

4.between a LIGHT aircraft and a MEDIUM aircraft— 3 minutes.

FIG 3-9-4 Wake turbulence separation for opposite-direction take-off

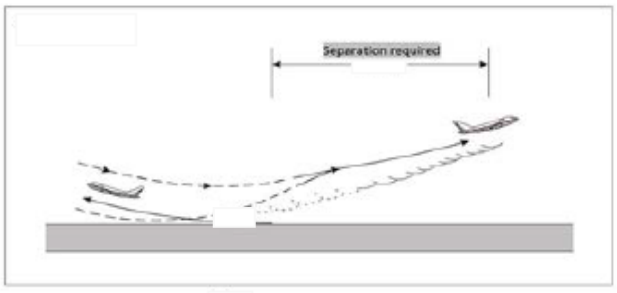
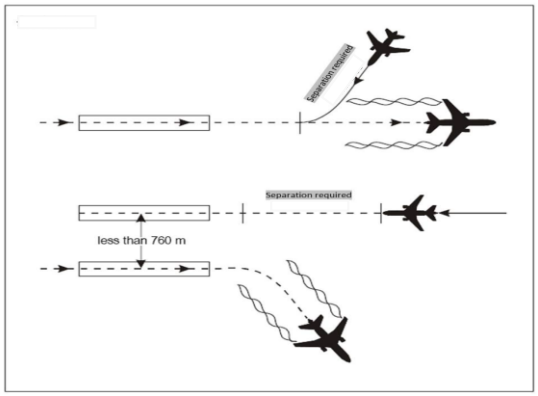


FIG 3-9-5 Wake turbulence separation for opposite-direction landing



i. When using a time minimum between aircraft taking-off, ensure that a following aircraft does not become airborne until the specified time interval has elapsed since leading aircraft became airborne.

j. Do not approve pilot requests to deviate from the required intervals contained in subparagraphs f through h.

PHRASEOLOGY:

HOLD FOR WAKE TURBULENCE.

REFERENCE—

Para 3−9−8, Wake Turbulence Separation for Intersection Departures

k. Inform an aircraft when it is necessary to hold for wake turbulence separation.

3-9-8 WAKE TURBULENCE SEPARATION FOR INTERSECTION DEPARTURES

a. When using wake turbulence categories contained in para 2-1-20 a. for aircraft taking off from an intersection or an intersection on a parallel runway separated by less than 760 m (2,500 ft) (see FIG 3-9-6), the following minimum separations shall be applied:

1. HEAVY aircraft taking off behind a SUPER aircraft — 3 minutes;
2. LIGHT or MEDIUM aircraft taking off behind a SUPER aircraft — 4 minutes;
3. LIGHT or MEDIUM aircraft taking off behind a HEAVY aircraft — 3 minutes;

4. LIGHT aircraft taking off behind a MEDIUM aircraft — 3 minutes.

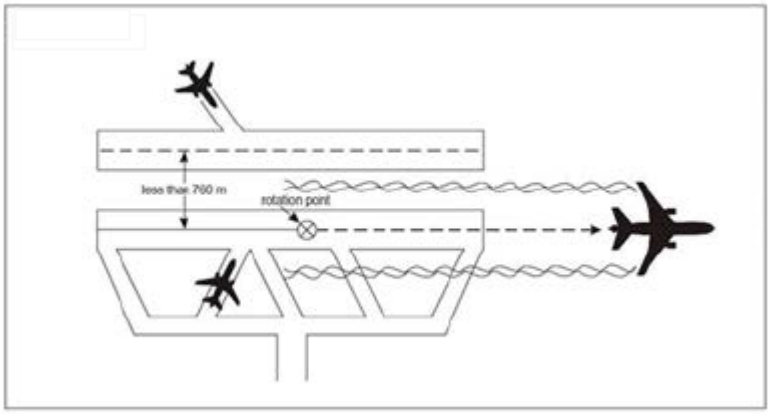
b. Inform an aircraft when it is necessary to hold for wake turbulence separation.

PHRASEOLOGY:

HOLD FOR WAKE TURBULENCE

FIG 3-9-6

Wake turbulence separation for following aircraft



3-9-9 INTERSECTING RUNWAY/INTERSECTING FLIGHT PATH SEPARATION

Separate departing aircraft from an aircraft using an intersecting runway, or nonintersecting runways when the flight paths intersect, by ensuring that the departure does not begin takeoff roll until one of the following exists:

a. The preceding aircraft has departed and passed the intersection, has crossed the departure runway, or is turning to avert any conflict. (See FIG 3-9-7 and FIG 3-9-8).

FIG 3-9-7 Intersecting Runway Separation

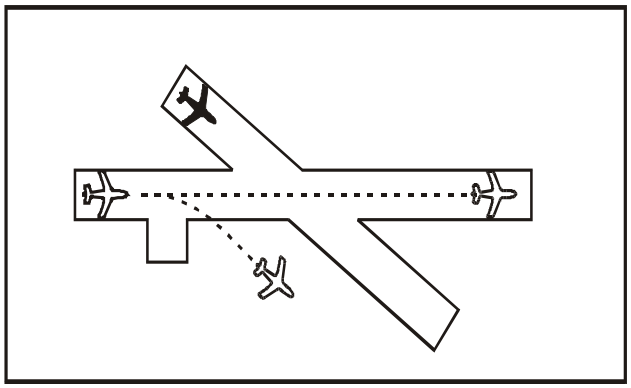
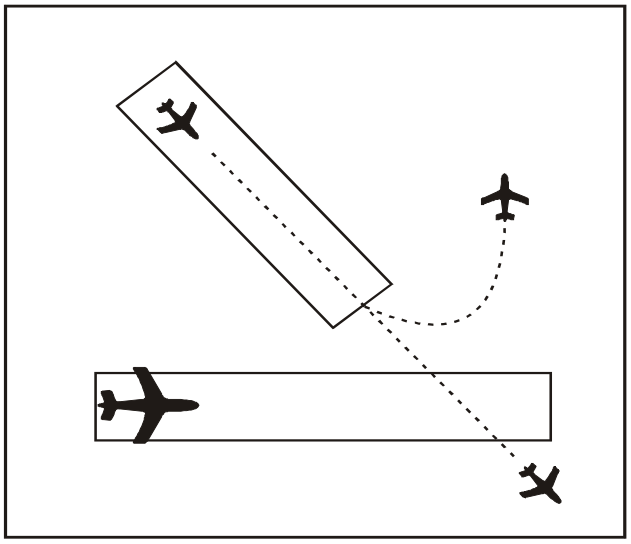


FIG 3-9-8 Intersecting Runway Separation



b. A preceding arriving aircraft is clear of the landing runway, completed the landing roll and will hold short of the intersection, passed the intersection, or has crossed over the departure runway (see FIG 3-9-9 and FIG 3-9-10).

FIG 3-9-9 Intersecting Runway Separation

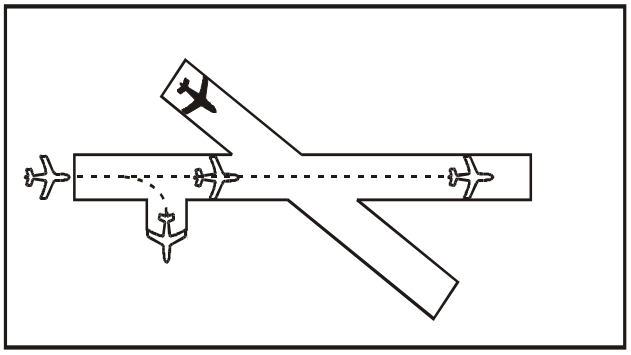
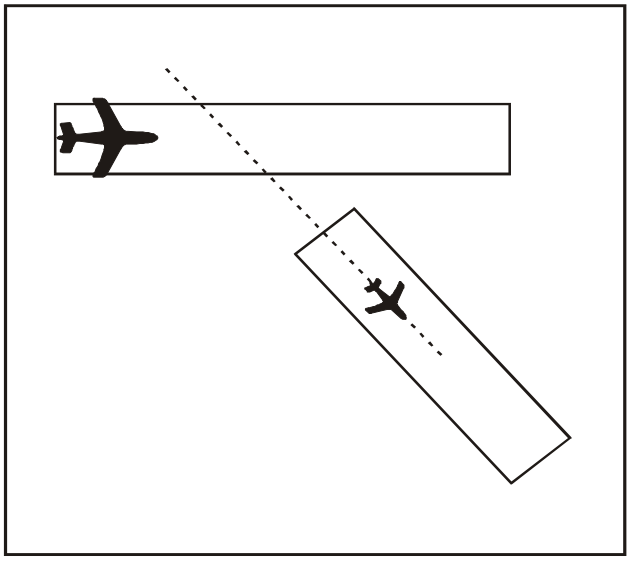


FIG 3-9-10 Intersecting Runway Separation



WAKE TURBULENCE APPLICATION

c. A When using wake turbulence categories contained in para 2-1-20 a. and when the aircraft are using:

crossing runways if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same level or less than 300 m (1,000 ft) below;

parallel runways separated by 760 m (2,500 ft) or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same level or less than 300 m (1,000 ft) below (see FIG 3-9-11);

the following minimum separations shall be applied

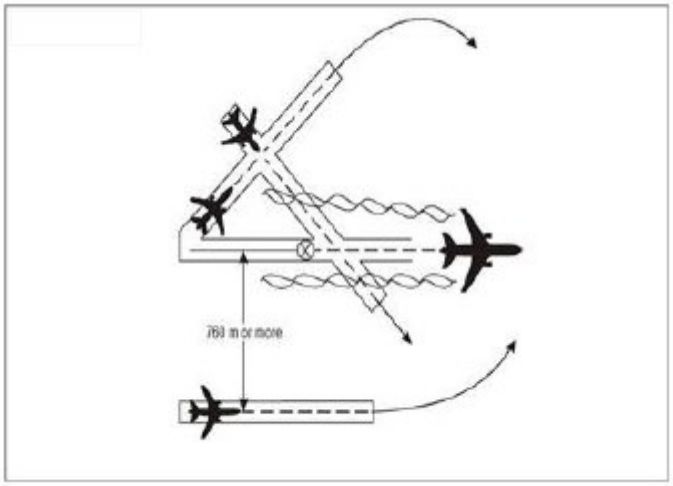
1.HEAVY aircraft taking off behind a SUPER aircraft — 2 minutes;

2.LIGHT or MEDIUM aircraft taking off behind a SUPER aircraft — 3 minutes;

3.LIGHT or MEDIUM aircraft taking off behind a HEAVY aircraft — 2 minutes;

4.LIGHT aircraft taking off behind a MEDIUM aircraft — 2 minutes.

FIG 3-9-11
Wake turbulence separation for crossing aircraft



d. Pilot requests to deviate from the required time intervals must not be approved if the preceding aircraft requires wake turbulence separation.

REFERENCE—

SUCCESSIVE OR SIMULTANEOUS DEPARTURES, Para 5-8-3.

DEPARTURES AND ARRIVALS ON PARALLEL RUNWAYS, Para 5-8-5.

3-9-10 TAKEOFF CLEARANCE

a. When issuing a clearance for takeoff, first state the runway number followed by the surface wind and the takeoff clearance.

PHRASEOLOGY:

RUNWAY(runway number), WIND (direction and speed), CLEARED FOR TAKEOFF.

NOTE—

Turbine-powered aircraft may be considered ready for takeoff when they reach the runway unless they advise otherwise.

REFERENCE—

DEPARTURE TERMINOLOGY, Para 4-3-1.

b. When clearing an aircraft for takeoff from an intersection, state the runway intersection

PHRASEOLOGY:

RUNWAY (number) AT (taxiway designator) CLEARED FOR TAKEOFF.

c. When two or more aircraft call the tower ready for departure, one or more at the full length of a runway and one or more at an intersection, state the location of the aircraft at the full length of the runway when clearing that aircraft for takeoff.

PHRASEOLOGY:

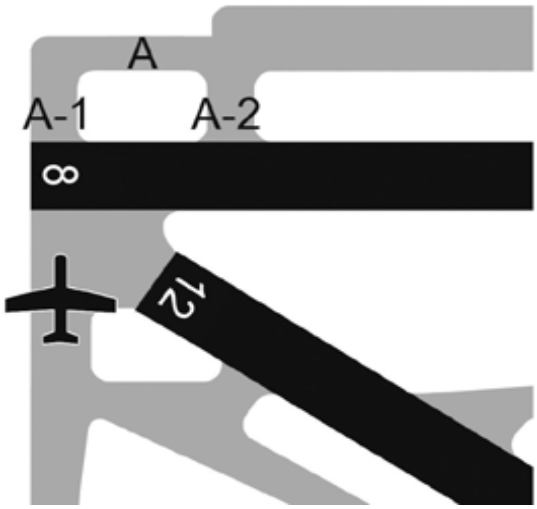
RUNWAY (number), FULL LENGTH, CLEARED FOR TAKEOFF.

EXAMPLE:

"Cathay Four Eighty Two, Runway Two-Three Left full length, cleared for takeoff."

d. The controller must ensure that all runways along the taxi route that lead to the departure runway are crossed before the takeoff clearance is issued, except as stated in para 3−9−10e. (see FIG 3-9-12)

FIG 3-9-12 Runway/Taxiway Proximity



e. At those aerodromes where the aerodrome configuration does not allow for an aircraft to completely cross one runway and hold short of the departure runway and/or where aerodromes do not have runway hold markings between runways, state the runway to be crossed with the takeoff clearance if the aircraft is not able to complete a runway crossing before reaching its departure runway. (see FIG 3-9-13)

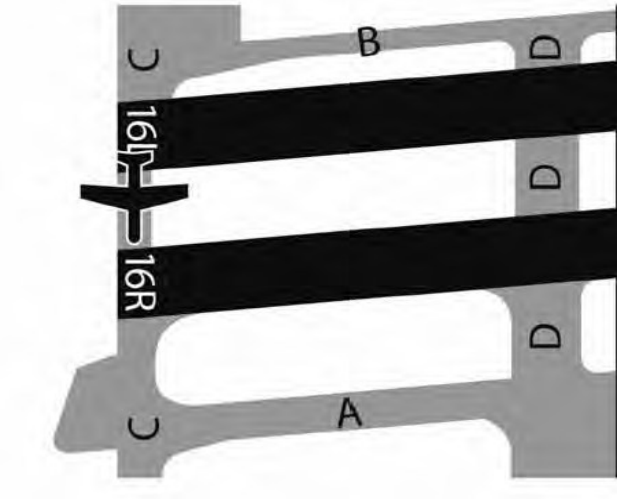
PHRASEOLOGY−

CROSS RUNWAY (number), RUNWAY (number) CLEARED FOR TAKEOFF.

EXAMPLE−

"CROSS RUNWAY ONE SIX LEFT, RUNWAY ONE SIX RIGHT, CLEARED FOR TAKEOFF."

FIG 3-9-13 Runway/Taxiway Proximity



REFERENCE—

P/CG Term− Clear of the Runway

f. Do not use the term "full length" when the runway length available for departure has been temporarily shortened. On permanently shortened runways, do not use the term "full length" until the AIP is updated to include the change(s).

NOTE—

The use of the term "full length" could be interpreted by the pilot(s) as the available runway length prior to the runway

being shortened.

g. Whenever a runway length has been temporarily or permanently shortened, state the word "shortened" immediately following the runway number as part of the takeoff clearance. This information must be issued in conjunction with the takeoff clearance.

1. The addition of "shortened" must be included in the takeoff clearance for the duration of the construction project when the runway is temporarily shortened.

2. The addition of "shortened" must be included in the takeoff clearance until the AIP is updated to include the change(s) when the runway is permanently shortened.

PHRASEOLOGY:

RUNWAY (number) SHORTENED, CLEARED FOR TAKEOFF.

EXAMPLE*:*

"Runway Two-Seven shortened, cleared for takeoff."

PHRASEOLOGY:

RUNWAY (number) AT (taxiway designator)

INTERSECTION DEPARTURE (remaining length) SHORTENED,

CLEARED FOR TAKEOFF.

EXAMPLE:

"Runway Two-Eight at Echo One, intersection departure, shortened, cleared for takeoff."

h. ***Military****:* When an aircraft is cleared for takeoff, inform it of the closest traffic within 6 miles on final approach to the same runway. If the approaching aircraft is on a different frequency, inform it of the departing aircraft.

3-9-11 CANCELLATION OF TAKE-OFF CLEARANCE

a. Cancel a previously issued clearance for take-off and inform the pilot of the reason if circumstances require.

PHRASEOLOGY:

HOLD POSITION, CANCEL TAKE-OFF, I SAY AGAIN, CANCEL TAKE-OFF

b. Once an aircraft has started take-off roll, cancel the take-off clearance only for the purpose of safety. A take-off clearance shall not be cancelled after an aircraft has started its take-off roll solely for the purpose of meeting traffic management requirements/EDCT(expect departure clearance time).

PHRASEOLOGY:

STOP IMMEDIATELY [(repeat aircraft call sign) STOP IMMEDIATELY]

Section 10. ARRIVAL PROCEDURES AND SEPARATION

3-10-1 FORWARDING INFORMATION TO APPROACH CONTROL

a. Unless covered in a letter of agreement or a unit directive, forward the following, as appropriate, to the approach control unit serving your tower:

1. Arrival and departure times.
2. When required, advice that the first aircraft in the approach sequence is in communication with and is sighted by the aerodrome control tower, and that reasonable assurance exists that a landing can be accomplished

NOTE—

This allows the control unit to initiate pre-approach action (vectors for positioning, etc.) of a subsequent arrival. It in no way serves to relieve the approach control unit of its separation responsibility.

3. All available information relating to overdue or unreported aircraft.
4. Information concerning missed approaches.
5. Cancellation of IFR flight plan.
6. Information concerning aircraft that constitute essential local traffic to aircraft under the control of the unit providing approach control service.
7. Weather as required.

REFERENCE—

REPORTING WEATHER CONDITIONS, Para 2-6-6

b. When the weather is below VMC or the highest circling minima, whichever is greater, issue current weather to aircraft executing an instrument approach if it changes from that on the ATIS or that previously forwarded to the center/approach control.

3-10-2 UPDATING INFORMATION ON FINAL APPROACH

a. As soon as possible after transfer from approach control to tower, advise aircraft of the following:

1. Runway.
2. QNH.
3. Significant changes in the wind direction and speed:

NOTE—

If the controller possesses wind information in the form of components, the significant changes are:

① Mean head-wind component: 10 kts

② Mean tail-wind component: 2 kts

③ Mean cross –wind component: 5 kts

4. The latest information, if any, on wind shear and/or turbulence in the final approach area.

REFERENCE—

RUNWAY VISIBILITY REPORTING TERMINAL, Para 2-8

REFERENCE—

OPERATING PROCEDURES, Para 2-9-2

b. During final approach, advise aircraft of the following, without delay:

1. The sudden occurrence of hazards (e.g. unauthorized traffic on the runway).

2. Significant variations in the current surface wind, expressed in terms of minimum and maximum values.
3. Significant changes in runway surface conditions (e.g. RWYCC).
4. Changes in the operational status of required visual or non-visual aids.
5. Changes in observed RVR value(s) or visibility.

REFERENCE—

TERMINAL INFORMATION, Para 4-7-8

c. If the pilot does not indicate the appropriate ATIS code, and when a runway has been shortened, controllers must ensure that pilots receive the runway number combined with a shortened announcement for all arriving aircraft.

d. For opposite direction arrival operations, controllers may verbally issue the RWYCC, as identified in the RCR, in reverse order. Controllers must not include reversed RCR information on the ATIS broadcast.

3-10-3 TRAFFIC CIRCUIT INSTRUCTIONS

Issue circuit entry instructions as appropriate to the circumstances and traffic situation. Omit wind, temperature and QNH if the aircraft has already received these items.

PHRASEOLOGY:

JOIN [(direction of circuit)] (position in circuit)

or,

MAKE STRAIGHT-IN APPROACH,

RUNWAY (number)

WIND (direction and speed) (units) TEMPERATURE (number) QNH (number)

TRAFFIC (detail)

NUMBER ... FOLLOW (aircraft type and position) [additional instructions if required].

MAKE SHORT APPROACH

MAKE LONG APPROACH (or EXTEND DOWNWIND)

REPORT BASE (or FINAL, or LONG FINAL)

CONTINUE APPROACH [PREPARE FOR POSSIBLE GO AROUND]

GO AROUND

EXAMPLE:

"Join left circuit, downwind, runway 05, number two, follow the Boeing 737 left base, report final."

NOTE—

The report "LONG FINAL" is made when aircraft turn on to final approach at a distance greater than 4 NM from touchdown or when an aircraft on a straight-in approach is 8 NM from touchdown. In both cases a report "FINAL" is required at 4 NM from touchdown.

REFERENCE—

AERODROME AND TAXI CIRCUIT, Para 3-1-14

TERMINAL INFORMATION, Para 4-7-8

3-10-4 SAME RUNWAY SEPARATION

a. Separate an arriving aircraft from another aircraft using the same runway by ensuring that the arriving

aircraft does not cross the landing threshold until one of the following conditions exists or unless authorized in para 3-10-10, LEVEL RESTRICTED LOW APPROACH.

1. The other aircraft has landed and is clear of the runway (see FIG 3-10-1)
2. The preceding departing aircraft has crossed the end of the runway-in-use, or has started a turn (see FIG 3-10-2.)
3. When the succeeding aircraft is a helicopter, visual separation may be applied.

WAKE TURBULENCE APPLICATION

b. Issue wake turbulence cautionary advisories and the position, level if known, and direction of flight of:

1. The SUPER or HEAVY aircraft to aircraft landing behind a departing/arriving SUPER or HEAVY aircraft on the same or parallel runways separated by less than 760m/2,500 feet.

EXAMPLE:

"Runway Zero Five cleared to land, caution wake turbulence, HEAVY Boeing Seven Forty Seven departing Runway Zero Five."

"Number two, follow HEAVY Boeing Seven Forty Seven on two-mile final. Caution wake turbulence."

FIG 3-10-1 Same Runway Separation

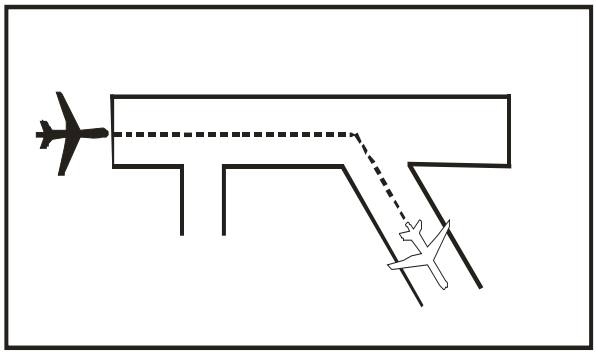
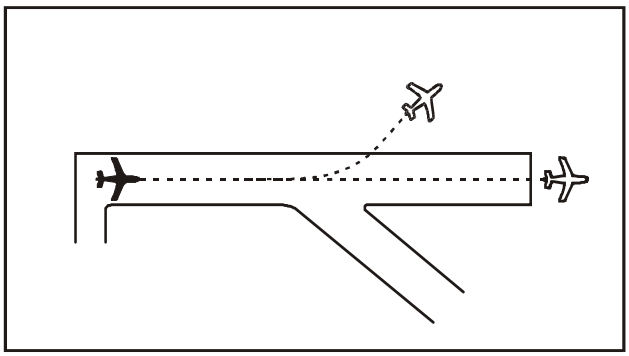


FIG 3-10-2 Same Runway Separation



2. The MEDIUM aircraft to a LIGHT aircraft landing behind a departing/arriving MEDIUM aircraft on the same or parallel runways separated by less than 760m/2,500 feet.

EXAMPLE:

"Traffic, Boeing 737 on 2−mile final to the parallel runway. Caution wake turbulence."

REFERENCE—

LEVEL RESTRICTED LOW APPROACH, Para 3-10-10.

3-10-5 LANDING CLEARANCE

a. Issue landing clearance when separation as prescribed in 3-10-4 will exist. Issue surface wind when clearing an aircraft to land, touch-and-go, stop-and-go, low approach, or the option. Restate the landing runway whenever more than one runway is active, or an instrument approach is being conducted to a closed runway.

PHRASEOLOGY:

WIND (direction and speed).

CLEARED TO LAND,

or

RUNWAY (designator), WIND (direction and speed),

CLEARED TO LAND.

NOTE—

A clearance to land means that appropriate separation on the landing runway will be ensured. A landing clearance does not relieve the pilot from compliance with any previously issued restriction.

b. Whenever a runway length has been temporarily or permanently shortened, state the word "shortened" immediately following the runway number as part of the landing clearance. This information must be issued in conjunction with the landing clearance.

1. The addition of "shortened" must be included in the landing clearance for the duration of the construction project when the runway is temporarily shortened.
2. The addition of "shortened" must be included in the landing clearance until the AIP is updated to include the change(s) when the runway is permanently shortened.

PHRASEOLOGY:

RUNWAY (number) SHORTENED, CLEARED TO LAND.

EXAMPLE:

"Runway Two-Seven shortened, cleared to land."

c. If landing clearance is temporarily withheld, insert the word "shortened" immediately after the runway number to advise the pilot to continue.

PHRASEOLOGY:

RUNWAY (number) SHORTENED, CONTINUE.

EXAMPLE:

"Runway Two Seven shortened, continue."

3-10-6 ANTICIPATING SEPARATION

a. Landing clearance to succeeding aircraft in a landing sequence need not be withheld if you observe the positions of the aircraft and determine that prescribed runway separation will exist when the aircraft crosses the landing threshold. Issue traffic information to the succeeding aircraft if a preceding arrival has not been previously reported and when traffic will be departing prior to their arrival.

NOTE—

Clear of the Runway-

An aircraft is clear of the runway when all parts of the aircraft are held short of, the applicable runway holding position marking or when exiting the runway, have crossed the applicable runway holding position marking.

EXAMPLE−

"EVA Eight-Five-Seven, Runway Two-Eight, cleared to land, number two following a Transasia Airbus Three Two Zero, two mile on final. Traffic will depart prior to your arrival."

"Dynasty Six Zero-Niner, Runway Zero-Five left, cleared to land. Traffic will depart prior to your arrival."

"Far Eastern zero eight two, runway zero niner, cleared to land, number two following a Dragon Airbus Three Three Zero, four mile on final."

b. Anticipating separation must not be applied when conducting para 3-9-5 LUAW operations.

3-10-7 LANDING CLEARANCE WITHOUT VISUAL OBSERVATION

When an arriving aircraft reports at a position where he should be seen but has not been visually observed, advise the aircraft as a part of the landing clearance that it is not in sight and restate the landing runway.

PHRASEOLOGY:

NOT IN SIGHT, RUNWAY (number) CLEARED TO LAND.

NOTE—

Aircraft observance on the tower surveillance radar display satisfies the visually observed requirement.

3-10-8 WITHHOLDING LANDING CLEARANCE

Do not withhold a landing clearance indefinitely even though it appears a violation of "Rules of the Air" has been committed. The apparent violation might be the result of an emergency situation. In any event, assist the pilot to the extent possible.

3-10-9 RUNWAY EXITING

a. In requesting a landing aircraft to perform a specific landing and/or roll-out maneuver, consider the type of aircraft, runway length, location of exit taxiways, reported braking action on runway and taxiway, and prevailing meteorological conditions. Do not request a SUPER or HEAVY aircraft to land beyond the touchdown zone of a runway.

b. Instruct aircraft where to turn-off the runway after landing, when appropriate, and advise the aircraft to hold short of a runway or taxiway if required for traffic.

PHRASEOLOGY:

TURN LEFT/RIGHT (taxiway/runway)

or

IF ABLE, TURN LEFT/RIGHT (taxiway/runway)

and if required

HOLD SHORT OF (runway).

NOTE—

Runway exiting or taxi instructions should not normally be issued to an aircraft prior to, or immediately after, touchdown.

c. Taxi instructions shall be provided to the aircraft by the aerodrome controller when:

1. Compliance with ATC instructions will be required before the aircraft can change to ground control, or
2. The aircraft will be required to enter a taxiway/runway/ramp area, other than the one used to exit the landing runway, in order to taxi clear of the landing runway.

EXAMPLE:

"Cathay Four Two Zero, turn left via taxiway Sierra six, cross taxiway Sierra Papa, hold short of taxiway Sierra Sierra, contact ground one two one decimal seven."

NOTE—

① *An aircraft is expected to taxi clear of the runway unless otherwise directed by ATC. In the absence of ATC instructions, an aircraft should taxi clear of the landing runway even if that requires the aircraft to protrude into or enter another taxiway/runway/ramp area. This does not authorize an aircraft to cross a subsequent taxiway/runway/ramp after clearing the landing runway.*

② *The pilot is responsible for ascertaining when the aircraft is clear of the runway.*

d. Ground control and aerodrome control shall protect a taxiway / runway / ramp intersection if an aircraft is required to enter that intersection to clear the landing runway.

e. Request a read back of runway hold short instructions when not received from the pilot.

EXAMPLE:

1. *"Charlie Six Seven One turn right via Delta, hold short of Runway Three Six Right."*

   "Charlie Six Seven One, Roger."

   "Charlie Six Seven One, read back hold instructions."

2. *"Far Eastern One Zero Two, turn right at the end, hold short of east High-speed taxiway."*

   "Far Eastern One Zero Two, Roger."

   "Far Eastern One Zero Two, read back hold instruction."

NOTE—

Read back hold instructions phraseology may be initiated for any point on a maneuvering area when the controller believes the read back is necessary.

3-10-10 LEVEL RESTRICTED LOW APPROACH

A low approach with a level restriction of not less than 500 feet above the aerodrome may be authorized except over an aircraft holding in position or a departing aircraft. Do not clear aircraft for restricted level low approaches over personnel unless aerodrome authorities have advised these personnel that the approaches will be conducted. Advise the approaching aircraft of the location of applicable ground traffic, personnel, or equipment.

NOTE—

① *The 500 feet restriction is a minimum. Higher levels should be used when warranted. For example, 1,000 feet is more appropriate for SUPER or HEAVY aircraft operating over unprotected personnel or LIGHT aircraft on or near the runway.*

② *This authorization includes level restricted low approaches over preceding landing or taxing aircraft. Restricted low approaches are not authorized over aircraft holding in position or departing aircraft.*

PHRASEOLOGY:

CLEARED LOW APPROACH AT OR ABOVE (level). TRAFFIC (description and location).

REFERENCE—

CONTROL OF OTHER THAN AIRCRAFT TRAFFIC, Para 3-1-4.

TRAFFIC INFORMATION, Para 3-1-6.

LIGHT SIGNALS, Para 3-2-1.

TIMELY INFORMATION, Para 3-3-3.

LINE UP AND WAIT, Para 3-9-5.

SAME RUNWAY SEPARATION, Para 3-10-4.

3-10-11 CLOSED TRAFFIC

Approve/disapprove pilot requests to remain in closed traffic for successive operations subject to local traffic conditions.

PHRASEOLOGY:

LEFT/RIGHT (if required) CLOSED TRAFFIC APPROVED. REPORT (position if required).

or

UNABLE CLOSED TRAFFIC, (additional information as required).

NOTE—

Segregated traffic circuits for helicopters to runways and other areas may be established by letter of agreement or other local operating procedures.

REFERENCE—

RUNWAY PROXIMITY, Para 3-7-4.

LINE UP AND WAIT, Para 3-9-5.

SAME RUNWAY SEPARATION, Para 3-10-4.

3-10-12 OVERHEAD MANEUVER

MILITARY

Issue the following to arriving aircraft that will conduct an overhead maneuver.

a. Pattern level and direction of traffic. Omit either or both if standard or when you know the pilot is familiar with a nonstandard procedure.

PHRASEOLOGY:

PATTERN ALTITIUDE (level). RIGHT TURNS.

b. Request for report on initial approach.

PHRASEOLOGY:

REPORT INITIAL.

c. "Break" information and request for pilot report. Specify the point of "break" only if nonstandard. Request the pilot to report "break" if required for traffic or other reasons.

PHRASEOLOGY:

BREAK AT (specified point).

REPORT BREAK.

NOTE—

Ordinarily, at aerodromes where military aircraft are based, standard overhead maneuver patterns are developed. These patterns generally specify:

① Radio contact required of the pilot.

② Speed to be maintained throughout the approach.

③ An initial approach three to five miles in length.

④ An elliptical pattern consisting of two 180 degree turns

⑤ A "break" point at which the first 180 degree turn is started.

⑥ Direction of turns (in some instances opposite those of the conventional pattern).

⑦ Level (at least 500 feet above the conventional pattern) to be maintained until the second 180 degree turn is started.

⑧ A "roll-out" on final approach not less than 1/4 miles from the landing threshold and not less than 300 feet above the ground.

d. Overhead maneuver patterns are developed at aerodromes where aircraft have an operational need to conduct the maneuver. An aircraft conducting an overhead maneuver is on VFR and the IFR flight plan is cancelled when the aircraft reaches the "initial point" on the initial approach portion of the maneuver. The existence of a standard overhead maneuver pattern does not eliminate the possible requirement for an aircraft to conform to conventional rectangular patterns if an overhead maneuver cannot be approved (see FIG 3-10-3).

NOTE—

Aircraft operating to an aerodrome without a functioning control tower must initiate cancellation of the IFR flight plan prior to executing the overhead maneuver or after landing.

EXAMPLES:

"Golf Bravo Three Two, Runway Zero Five, wind zero seven zero eight knots, pattern altitude two thousand, report initial."

"Golf Bravo Three Two, break at midfield, report break"

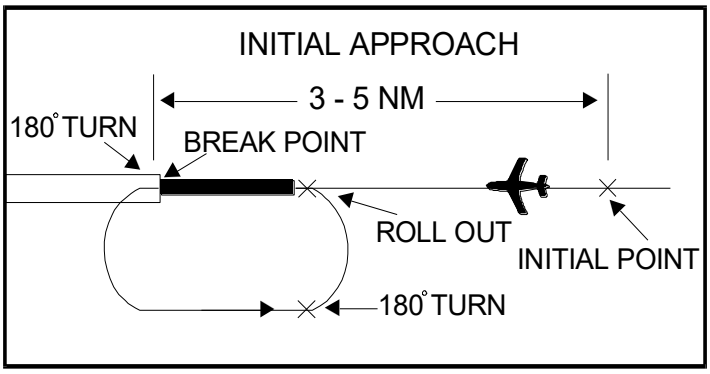
"Golf Bravo Three Two, cleared to land."

"Papa Alfa Two Two, Runway Two Three, wind two three zero degrees one four knots, right turns, report initial."

"Papa Alfa Two Two, report break."

"Papa Alfa Two Two, cleared to land."

FIG 3-10-3 Overhead Maneuver



e. Timely and positive controller action is required to prevent a conflict when an overhead pattern could extend into the path of a departing or a missed approach aircraft. Local procedures and/or coordination requirements should be set forth in an appropriate Letter of Agreement, unit directive, base flying manual etc., when the frequency of occurrence warrants.

3-10-13 SIMULATED FLAMEOUT (SFO) OPERATIONS/PRACTICE PRECAUTIONARY APPROACHES

a. Military aircraft may be authorized to make SFO/practice precautionary approaches if the following conditions are met:

1. A LOA for the operation is in effect between the control tower, approach control, and other adjacent units as required.
2. The exchange or issuance of traffic information as agreed to in any inter unit LOA is accomplished.
3. Traffic information regarding aircraft in radio communication with or visible to tower controllers which are operating within or adjacent to the flameout maneuvering area is provided to the SFO aircraft and other concerned aircraft.
4. The high-key level or practice precautionary approach maneuvering levels of the aircraft concerned are obtained prior to approving the approach. (See FIG 3-10-4).

NOTE—

① *Practice precautionary / flameout approaches are authorized only for specific aircraft. Precautionary approaches, however, might be made by any aircraft when engine failure is considered possible. The practice precautionary approach maneuvering area / levels may not conform to the standard flameout maneuvering area / levels.*

② *Simulated flameout approaches generally require high descent rates. Visibility ahead and beneath the aircraft is greatly restricted.*

③ *Pattern adjustments for aircraft conducting SFOs may impact the effectiveness of SFO training.*

REFERENCE—

LOW APPROACH AND TOUCH-AND-GO, Para 4-8-10.

b. For overhead simulated flameout approaches:

1. Request a report at the entry point

PHRASEOLOGY:

REPORT (high or low) KEY (as appropriate)

2. Request a report at low key.

   PHRASEOLOGY:

   REPORT LOW KEY.

3. At low key, issue low approach clearance or alternate instructions.

c. For straight-in simulation flameout approaches:

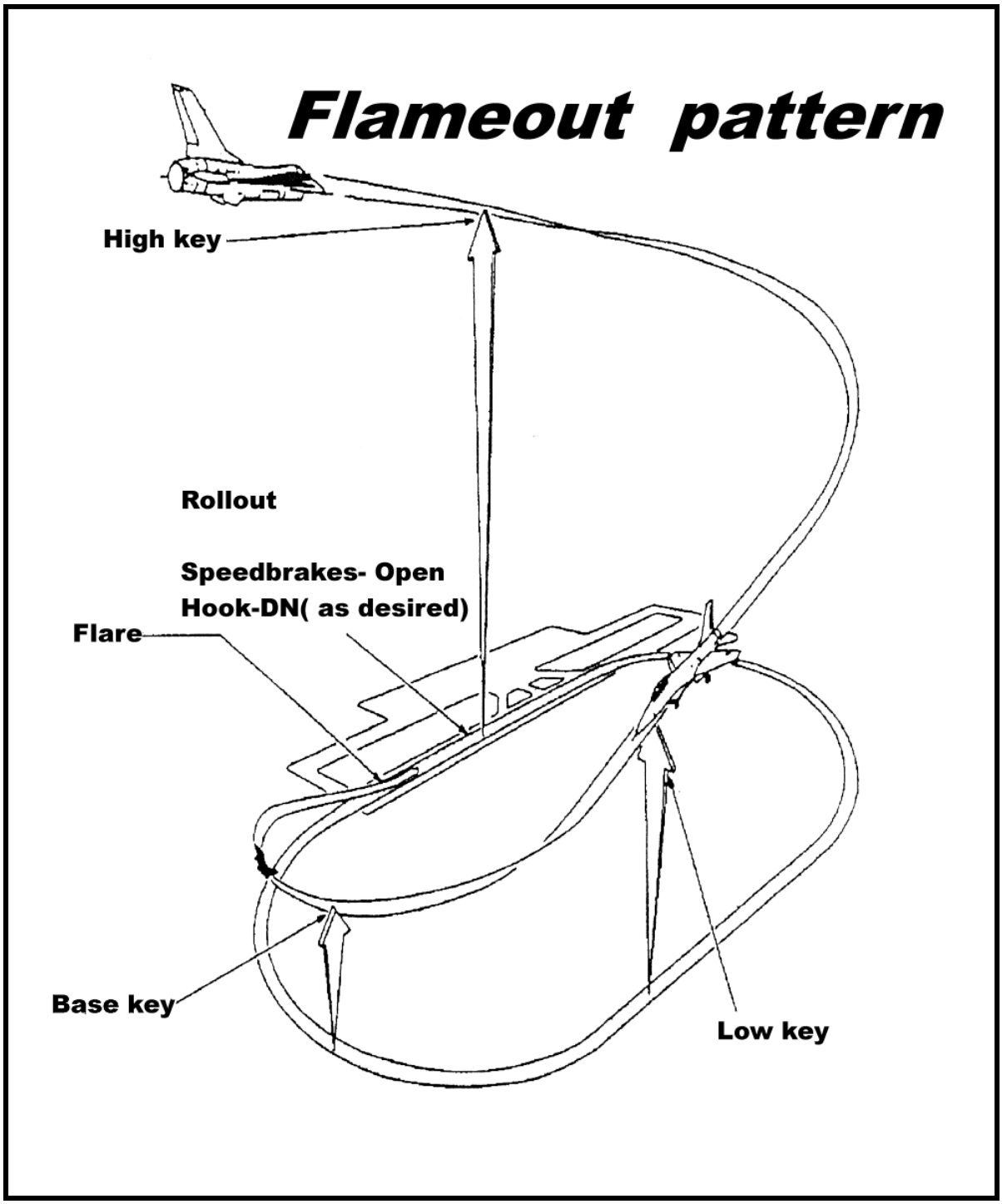
1. Request a position report from aircraft conducting straight-in SFO approaches.

   PHRASEOLOGY:

   REPORT (distance) MILES SIMULATED FLAMEOUT FINAL.

2. At the appropriate position on final (normally no closer than 3 miles), issue low approach clearance or alternate instruction (see FIG 3-10-5).

FIG 3-10-4 **Simulated Flameout [1]**



NOTE—

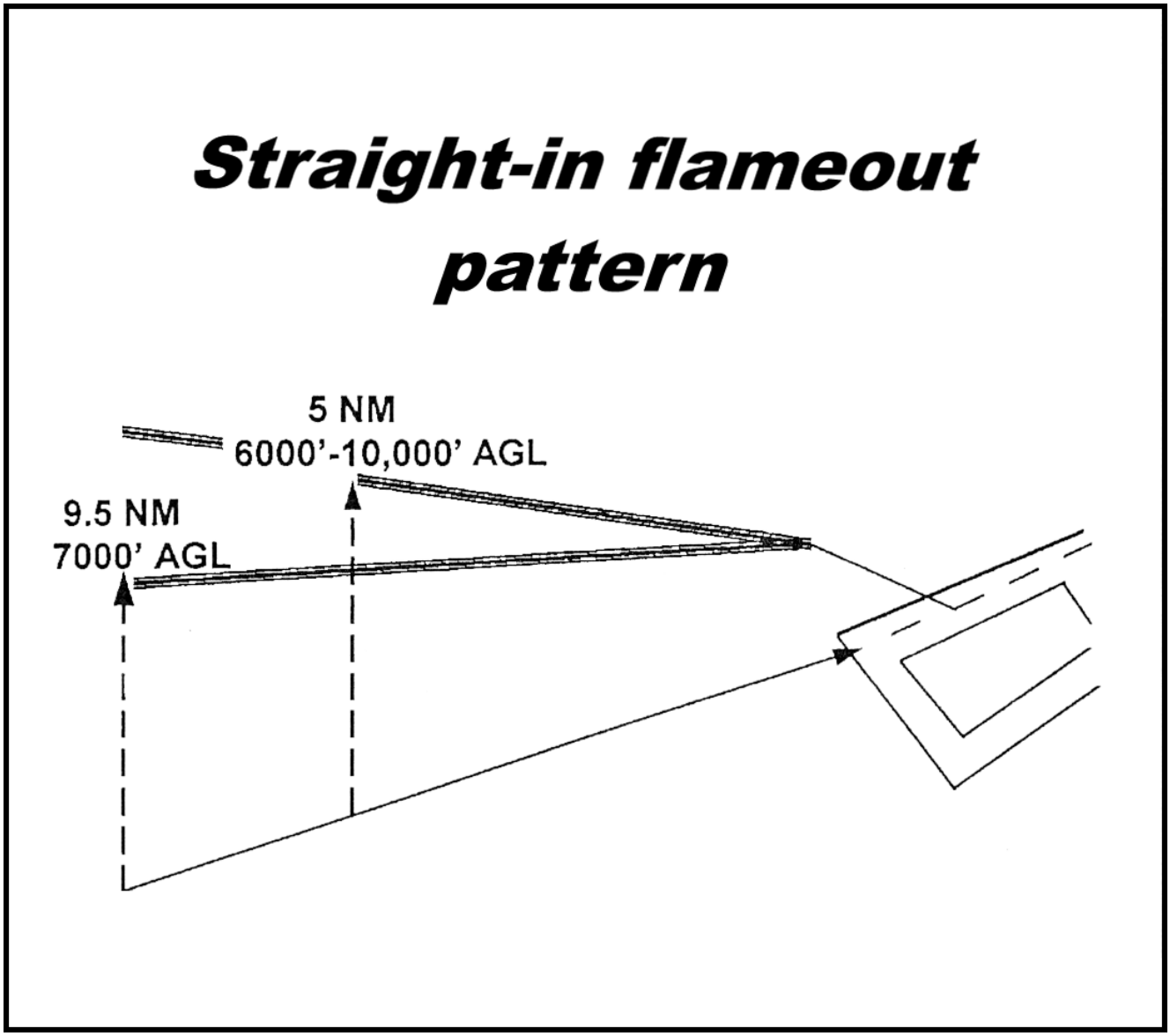
This illustration depicts a "flameout" maneuver:

① High key: That position over the aerodrome where the pilot begins to maneuver the aircraft to enter a high downwind leg.

② Low key: That position on high downwind leg just before turning on base leg.

③ "Flameout" Maneuvering Area: That airspace to be occupied by an aircraft practicing "flameout" procedures, which begin at the high key, includes the low key, and ends at the landing threshold.

FIG 3-10-5 **Simulated Flameout [2]**



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Section 11. HELICOPTER OPERATIONS

3-11-1 TAXI AND GROUND MOVEMENT OPERATION

a. **GROUND TAXI** – When necessary for a wheeled helicopter to taxi on the surface, use the phraseology in para 3-7-2, TAXI AND GROUND MOVEMENT OPERATION.

PHRASEOLOGY:

HOLD SHORT OF (runway-in-use, extended runway centerline, other).

NOTE—
Ground taxiing uses less fuel than air-taxiing and minimizes air turbulence. However, under certain conditions, such as rough, soft, or uneven terrain, it may become necessary to air-taxi for safety considerations. Helicopters with articulating rotors (usually designs with three or more main rotor blades) are subject to "ground resonance" and may, on rare occasions, suddenly lift off the ground to avoid severe damage or destruction.

b. **AIR-TAXI** - When requested or necessary for a helicopter/VTOL aircraft to proceed at a slow speed above the surface, normally below 20 knots and in ground effect, use the following phraseology supplemented, as appropriate, from para 3-7-2, TAXI AND GROUND MOVEMENT OPERATION:

PHRASEOLOGY:

AIR–TAXI

CAUTION (dust, loose debris, taxiing light aircraft, personnel, etc.).

AIR-TAXI TO (or VIA) (location or routing as appropriate)[CAUTION (dust, loose debris, taxiing light aircraft, personnel, etc]

AIR-TAXI VIA (direct, as requested, or specified route) TO (location, heliport, operating or maneuvering area, active or inactive runway).

AVOID (aircraft or vehicles or personnel)

NOTE—
Air-taxiing consumes fuel at a high burn rate, and helicopter downwash turbulence (produced in ground effect) increases significantly with larger and heavier helicopters.

c. **AIR TRANSIT** - When requested or necessary for a helicopter to proceed expeditiously from one point to another, at or below 100 feet AGL and at airspeeds above 20 knots, use the following phraseology, supplemented, as appropriate, with the phraseology in Para 3-7-2, TAXI AND GROUND MOVEMENT OPERATION.

PHRASEOLOGY:

AIR-TRANSIT:

VIA (direct, as requested, or specified route)

TO (location, heliport, helipad, operating/maneuvering area, active/inactive runway).

AVOID (aircraft/vehicles/personnel).

If required,

REMAIN AT OR BELOW (level).

CAUTION (wake turbulence or other reasons above).

LAND AND CONTACT TOWER,

or

HOLD FOR (reason: takeoff clearance, release, landing/taxiing aircraft, etc.)

NOTE—

AIR-TRANSIT is the more expeditious method for helicopter movements on aerodromes provided ground operations/conditions permit. Air-transit authorizes the pilot to proceed above the surface at speeds more than those used for air-taxi. Unless otherwise requested or instructed, the pilot should remain at or below 100 feet AGL.

d. Avoid issuing a frequency change to helicopters known to be single-piloted during air-taxiing, hovering, or low-level flight. Whenever possible, relay necessary control instructions until the pilot is able to change frequency.

3-11-2 HELICOPTER TAKEOFF CLEARANCE

a. Issue take-off clearances from maneuvering areas other than runways-in-use, or in diverse directions from runways-in-use, with additional instructions, as necessary. Whenever possible, issue take-off clearance in lieu of extended air-taxi or air transit operations.

PHRASEOLOGY:

(Present position, taxiway, helipad) MAKE RIGHT/LEFT TURN FOR (direction, points of compass, heading, NAVAID radial)

DEPARTURE/DEPARTURE ROUTE (number, name, or code)

AVOID (aircraft/vehicles/personnel),

Or,

REMAIN (direction) OF (runways-in-use)

CLEARED FOR TAKE-OFF

b. If take-off is requested from non-movement areas**,** an area not authorized for helicopter use, or an area off the aerodrome, use the following phraseology instead of the take-off clearance in subparagraph a. above:

PHRASEOLOGY:

DEPARTURE FROM (requested location) WILL BE AT YOUR OWN RISK (additional instructions, as necessary).

USE CAUTION (if applicable).

REPORT AIRBORNE/DEPARTURE.

c. Unless agreed to by the pilot, do not issue downwind take-off if the tailwind exceeds 5 knots.

NOTE—

A pilot request to takeoff from a given point in a given direction constitutes agreement.

3-11-3 HELICOPTER DEPARTURE SEPARATION

Separate a departing helicopter from other helicopters by ensuring that it does not takeoff until one of the following conditions exists:

NOTE—

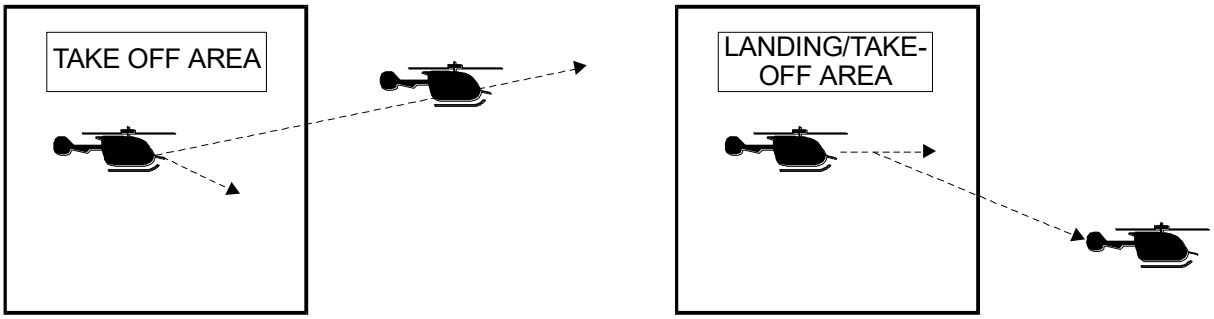
Helicopters performing air-transit operations within the boundary of the aerodrome are considered to be taxiing aircraft.

a. A preceding, departing helicopter has left the takeoff area (see FIG 3-11-1).

b. A preceding, arriving helicopter has taxied off the landing area (see FIG 3-11-2).

FIG 3-11-1 **Helicopter Departure Separation**

FIG 3-11-2 **Helicopter Departure Separation**



3-11-4 HELICOPTER ARRIVAL SEPARATION

Separate an arriving helicopter from other helicopters by ensuring that it does not land until one of the following conditions exists:

a. A preceding, arriving helicopter has come to a stop or taxied off the landing area (see FIG 3-11-3 and FIG 3-11-4).

b. A preceding, departing helicopter has left the landing area (see FIG 3-11-5).

FIG 3-11-3 **Helicopter Arrival Separation**

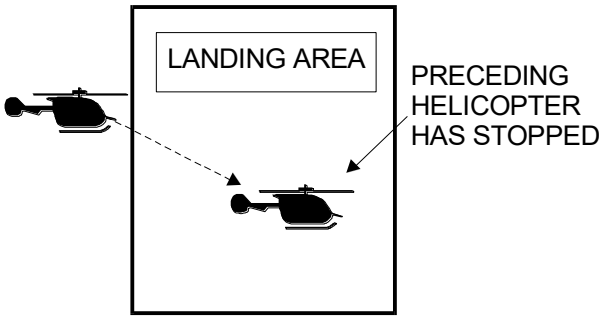


FIG 3-11-4 **Helicopter Arrival Separation**

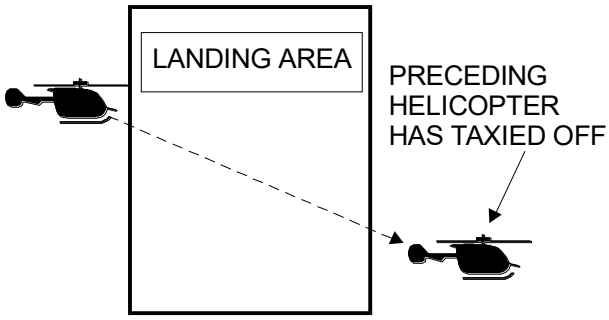
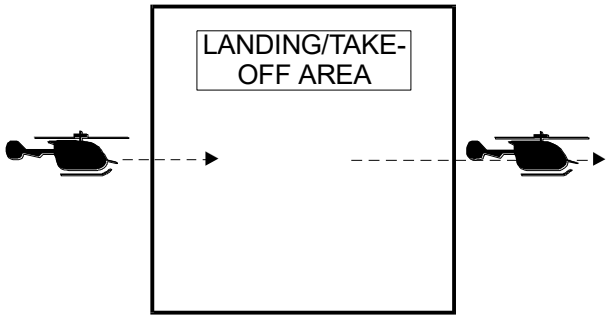


FIG 3-11-5 **Helicopter Arrival Separation**



3-11-5 HELICOPTER LANDING CLEARANCE

a. Issue landing clearances to helicopters going to movement areas other than runways-in-use, or from diverse directions to points on runways-in-use, with additional instructions, as necessary. Whenever possible, issue landing clearance in lieu of extended air-taxi or air transit operations.

PHRASEOLOGY:

MAKE STRAIGHT-IN/CIRCLING APPROACH

LEFT/RIGHT TURN TO (location, runway, taxiway, helipad, Maltese cross) ARRIVAL/ARRIVAL

ROUTE (number, name, or code).

REMAIN (direction/distance) FROM (runway, runway centerline, other helicopter/aircraft).

CAUTION (power lines, unlighted obstructions, wake turbulence, etc.).

CLEARED TO LAND.

CONTACT GROUND.

AIR TAXI TO RAMP.

b. If landing is requested to a non-movement area, areas not authorized for helicopter use, or areas off the aerodrome, use the following phraseology instead of the landing clearance in subparagraph a. above:

PHRASEOLOGY:

LANDING WILL BE AT YOUR OWN RISK (additional instructions, as necessary). USE CAUTION (if applicable).

REPORT ON THE GROUND (if appropriate).

c. Unless agree to by the pilot, do not issue downwind landings if the tailwind exceeds 5 knots.

NOTE—

A pilot request to land at a given point from a given direction constitutes agreement.

Section 12. ENGINE STARTING AND PUSH BACK PROCEDURE

3-12-1 ENGINE STARTING PROCEDURE

Requests to start engines are normally made to facilitate ATC planning and to avoid excessive fuel wastage by aircraft delayed on the ground. At certain aerodromes the pilot will state, along with the request, the location of the aircraft and acknowledge receipt of the ATIS broadcast. When there will be a delay to the departure of the aircraft the controller will normally indicate a time to start up or expect to start up.

PHRASEOLOGY:

START UP APPROVED.

START UP AT (time).

EXPECT START UP AT (time)

EXPECT DEPARTURE (time) START UP AT OWN DISCRETION.

3-12-2 PUSH BACK PROCEDURE

At many aerodromes at which medium aircraft operate, the aircraft are parked nose-in to the terminal in order to save parking space. Aircraft have to be pushed backwards by tugs before they can taxi for departure. Requests for pushback are made to ATC depending on the local procedures.

PHRASEOLOGY:

PUSH BACK APPROVED.

STANDBY.

STANDBY, EXPECT (time) DELAY DUE TO (traffic information)

PUSHBACK AT OWN DISCRETION.

EXPECT (time) MINUTES DELAY DUE (reason).

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Chapter 4. IFR

Section 1. NAVAID USE LIMITATIONS

4-1-1 LEVEL AND DISTANCE LIMITATIONS

When specifying a route other than an established airway or route, do not exceed the limitations in the Table on any portion of the route which lies within controlled airspace. (For Level and Distance Limitations, see TBL 4-1-1, TBL 4-1-2, TBL 4-1-3 and TBL 4-1-4). (For correct application of level and distance limitations see FIG 4-1-1 and FIG 4-1-2.)

REFERENCE—

FIX USE, Para 4-1-4.

METHODS, Para 5-6-2.

TBL -4-1-1 VOR/VORTAC/TACAN NAVAID's Normal Usable Levels and Radius Distance

Class	Level	Distance (miles)
T	12,000 and below	25
L	Below 18,000	40
H	Below 14,500	40
H	14,500-17,999	100
H	18,000-45,000	130
H	Above 45,000	100

TBL 4-1-2 L/MF Radio Beacon (RBN) Usable Radius Distances for All Levels

Class	Power (watts)	Distance (miles)
CL	Under 25	15
MH	Under 50	25
H	50-1,999	50
HH	2000 or more	75

TBL 4-1-3 ILS Usable Height and Distance *

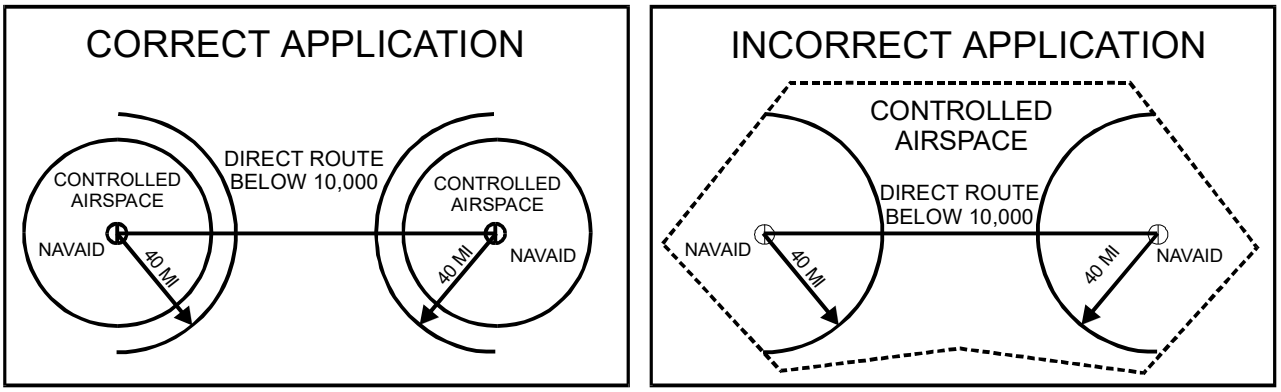
Height (feet) above transmitter	Distance (miles from transmitter)
4,500	10 (for glideslope)
4,500	18 (for localizer)
* Use the current flight check height/level limitations if different from the above minima.	

FIG 4-1-1

Application of Level and Distance Limitations [Application 1]

FIG 4-1-2

Application of Level and Distance Limitations [Application 2]



4-1-2 EXCEPTIONS

Level and distance limitations need not be applied when any of the following conditions are met:

a. Routing is initiated by ATC or requested by the pilot and the following is provided:

1. ATS surveillance monitoring.

2. As necessary, track guidance unless the aircraft is/F, /G or /R equipped.

NOTE—

①.Para 5-5-1, Application, requires ATS surveillance separation be provided to RNAV aircraft on random (impromptu) routes at FL 450 and below.

② When a clearance is issued beyond the level and/or distance limitations of a NAVAID, in addition to being responsible for maintaining separation from other aircraft and airspace, the controller is responsible for providing aircraft with information and advice related to significant deviations from the expected flight path.

b. Operational necessity requires and approval has been obtained from the appropriate authority to exceed them.

4-1-3 CROSSING LEVEL

Use a level consistent with the limitations of the aid when clearing an aircraft to cross or hold at a fix.

REFERENCE—

METHODS, Para 5-6-2.

4-1-4 FIX USE

Request aircraft position reports only over fixes shown on charts, except as follows:

NOTE—

Waypoints filed in random RNAV routes automatically become compulsory reporting points for the flight unless otherwise advised by ATC.

a. Unless the pilot requests otherwise, use only those fixes shown on en route charts, high level instrument approach procedures charts, and SID charts when clearing military turbojet single-piloted aircraft.

b. Except for military single-piloted turbojet aircraft, unpublished fixes may be used if the name of the NAVAID and, if appropriate, the radial/track/azimuth and frequency/channel are given to the pilot. An unpublished fix is defined as one approved and planned for publication which is not yet depicted on the charts or one which is used in accord with the following:

1. Unpublished fixes are formed by the en route radial and either a DME distance from the same NAVAID or an intersecting radial from an off-route VOR/VORTAC/TACAN. DME shall be used in lieu of off-route radials, whenever possible.

2. Except where known signal coverage restrictions exist, an unpublished fix may be used for ATC purposes if its location does not exceed NAVAID level and distance limitation, and when off-route radials are used, the angle of divergence meets the criteria prescribed below.

   NOTE—
   Unpublished fixes should not negate the normal use of published intersections. Frequent routine use of an unpublished fix would justify establishing a fix.

   REFERENCE—
   LEVEL AND DISTANCE LIMITATIONS, Para 4-1-1.

3. Do not hold aircraft at unpublished fixes below the lowest assignable level dictated by terrain clearance for the appropriate holding pattern airspace area (template) regardless of the MEA for the route being flown.

4. When the unpublished fix is located on an off-route radial and the radial providing track guidance, it shall be used consistent with the following divergence angles:

   (a) When holding operations are involved with respect to subparas (b) and (c) below, the angle of divergence shall be at least 45 degrees.

   (b) When both NAVAIDs involved are located within 30 NM of the unpublished fix, the minimum divergence angle is 30 degrees.

   (c) When the unpublished fix is located over 30 NM from the NAVAID generating the off-track radial, the minimum divergence angle shall increase 1 degree per NM up to 45 NM; e.g. 45NM would require 45 degrees.

   (d) When the unpublished fix is located beyond 45 NM from the NAVAID generating the off-track radial, the minimum divergence angle shall increase 1/2 degree per NM; e.g. 130NM would require 88 degrees.

c. TACAN-only aircraft (type suffix M, N, or P) possess TACAN with DME, but no VOR or LF navigation system capability. Assign fixes based on TACAN or VORTAC facilities only.

   NOTE—
   TACAN-only aircraft can never be held overhead the NAVAID, be it TACAN or VORTAC.

d. DME fixes shall not be established within the no-track signal zone of the NAVAID from which inbound holding track information would be derived.

   REFERENCE—
   NAVAID FIXES, Para 2-5-3.
   METHODS, Para 5-6-2

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Section 2. CLEARANCES

4-2-1 CLEARANCE MESSAGE

a. Clearances shall contain positive and concise data and shall, as far as practicable, be phrased in a standard manner.

b. Issue the following clearance items, as appropriate, in the order listed below:

1. Aircraft identification;
2. Clearance limit;
   (1) A clearance limit shall be described by specifying the name of the appropriate significant point, or aerodrome, or controlled airspace boundary.
   (2) When prior coordination has been effected with units under whose control the aircraft will subsequently come, or if there is reasonable assurance that it can be effected a reasonable time prior to their assumption of control, the clearance limit shall be the destination aerodrome or, if not practicable, an appropriate intermediate point, and coordination shall be expedited so that a clearance to the destination aerodrome may be issued as soon as possible.
   (3) If an aircraft has been cleared to an intermediate point in adjacent controlled airspace, the appropriate ATC unit will then be responsible for issuing, as soon as practicable, an amended clearance to the destination aerodrome.
   (4) When the destination aerodrome is outside controlled airspace, the ATC unit responsible for the last controlled airspace through which an aircraft will pass shall issue the appropriate clearance for flight to the limit of that controlled airspace.
3. Route of flight;
4. Level(s) of flight for the entire route or part thereof and changes of levels if required;

   NOTE—

   If the clearance for the levels covers only part of the route, it is important for the air traffic control unit to specify a point to which the part of the clearance regarding levels applies whenever necessary.
5. Any necessary instructions or information on other matters such as SSR transponder operation, approach or departure maneuvers, communications and the time of expiry of the clearance.

   NOTE—

   The time of expiry of the clearance indicates the time after which the clearance will be automatically cancelled if the flight has not been started.

c. When issuing a clearance to an airborne military single seated aircraft containing a level assignment, do not include more than one of the following in the same transmission:

1. Frequency change
2. Transponder change
3. Heading
4. Altimeter setting
5. Traffic information containing a level.

REFERENCE—

IFR-VFR AND VFR-IFR FLIGHTS, Para 4-2-5.

LEVEL ASSIGNMENT, Para 4-5-6.

4-2-2 CLEARANCE PREFIX

a. Prefix a clearance, information, or a request for information which will be relayed to an aircraft through a non-ATC unit by stating “ATC clears,” “ATC advises,” or “ATC requests.”

b. Non-ATC unit shall prefix a clearance with the appropriate phrase: “ATC clears,” “ATC advises,” etc.

4-2-3 CLEARANCE RELAY

Relay clearance verbatim.

REFERENCE—
COMMUNICATIONS FAILURE, Para 9-4-1.

4-2-4 ROUTE OR LEVEL AMENDMENTS

a. Amend route of flight in a previously issued clearance by one of the following:

1. State the amended route portion to a significant point of original route.

PHRASEOLOGY:

RECLEARED (amended route portion) TO (significant point of original route)[REST OF CLEARANCE UNCHANGED]

EXAMPLE:

Alfa Romeo Six Six, recleared Alfa One, Whiskey Six to Sigang.

2. Issue a clearance “direct” to a point on the previously issued route.

PHRASEOLOGY:

CLEARED DIRECT (fix, waypoint).

Or

CLEARED DIRECT (destination) AERODROME.

NOTE—
Clearance authorizing “direct” to a point on a previously issued route do not require the phrase “rest of clearance unchanged”. However, it must be understood where the previously cleared route is resumed. When necessary, “rest of clearance unchanged” may be used to clarify routing.

3. Issue the entire route by stating the amendment.

EXAMPLE:

Alfa Romeo 68 has been cleared to Sigang VORTAC via W4, maintain FL200. After takeoff the aircraft is rerouted via A1 W6 W4. The controller issues one of the following as amended clearance:

① *“Alfa Romeo Six Eight recleared Alfa One, Whiskey Six, Whiskey Four, rest of clearance unchanged.”*

② *“Alfa Romeo Six Eight recleared Alfa One Whiskey Six, Sigang direct Kizin, maintain flight level two zero zero.”*

b. When route or level in a previously issued clearance is amended, restate all applicable level restrictions.

EXAMPLE:

① *A departing aircraft is cleared to cross Wugoo at or above 3,000; Xebec at or above FL150; maintain FL220. Shortly after departure, the level to be maintained is changed to FL240. Because level restrictions remain in effect, the controller issues amended clearance as follows:*

“Amend level, cross Wugoo at or above three thousand; cross Xebec at or above flight level one five zero; maintain flight level two four zero.”

Shortly after departure, level restrictions are no longer applicable, the controller issues amended clearance as follows:

“Climb and maintain flight level two four zero.”

② *An aircraft is cleared to climb via Tinho One Alfa RNAV Departure with published altitude restrictions and maintain initial altitude 5,000. Shortly after departure the altitude is changed to FL200 and compliance with the altitude restrictions is still required, the controller issues an amended clearance as follows: "Climb via SID, maintain flight level two zero zero."*

c. Issue an amended clearance if a speed restriction is declined because it cannot be complied with concurrently with a previously issued level restriction.

PHRASEOLOGY:

RECLEARED (amended clearance detail),[REST OF CLEARANCE UNCHANGED]

EXAMPLE:

(An aircraft is cleared to cross Magong at FL250. Shortly thereafter the aircraft is cleared to reduce airspeed to 250 knots. The pilot informs the controller that both clearances cannot be complied with simultaneously. The controller issues the amended clearance as follows)

"Recleared cross Magong at flight level two five zero. Then, reduce speed to two five zero knots,[REST OF CLEARANCE UNCHANGED]."

NOTE—

The phrase, "do the best you can" or comparable phrases are not valid substitutes for an amended clearance with level or speed restrictions.

REFERENCE—

OPERATIONAL REQUESTS, Para 2-1–19.

DEPARTURE CLEARANCES, Para 4-3-2.

CLEARANCE INFORMATION, Para 4-7-1.

METHODS, Para 5-6-2.

METHODS, Para 5-7-2.

4-2-5 IFR-VFR AND VFR-IFR FLIGHTS

a. Clear an aircraft planning IFR operations for the initial part of flight and VFR for the latter part to the fix at which the IFR part ends.

b. Treat an aircraft planning VFR for the initial part of flight and IFR for the latter part as a VFR departure. Issue a clearance to this aircraft when it requests IFR clearance approaching the fix where it proposes to start IFR operations.

c. When an aircraft changes from VFR to IFR, the controller shall assign a SSR code to Mode C equipped aircraft that will allow TOHAP/MSAW alarms.

d. When a VFR aircraft, operation below the minimum level for IFR operations, requests an IFR clearance and the pilot informs you, or you are aware that they are unable to climb in VFR conditions to the minimum IFR level:

PHRASEOLOGY:

(Aircraft call sign), ARE YOU ABLE TO MAINTAIN YOUR OWN TERRAIN AND OBSTRUCTION CLEARANCE UNTIL REACHING (appropriate MVA/MIA/MEA/MOCA)

1. Before issuing a clearance, ask if the pilot is able to maintain terrain and obstruction clearance during a climb to the minimum IFR level.

NOTE—

Pilots of pop-up aircraft are responsible for terrain and obstacle clearance until reaching minimum instrument altitude (MIA) or minimum en route altitude (MEA). Pilot compliance with an approved CAA procedure or an ATC instruction transfers that responsibility to the CAA; therefore, do not assign (or imply) specific track guidance that will (or could) be in effect below the MIA or MEA.

EXAMPLE:

"November Eight Seven Six, are you able to provide your own terrain and obstruction clearance between your present level and six thousand feet?"

2. If the pilot is able to maintain their own terrain and obstruction clearance, issue the appropriate IFR clearance as prescribed in paragraphs 4-2-1, CLEARANCE ITEMS, and 4-5-5, MINIMUM EN ROUTE LEVEL.
3. If the pilot states that they are unable to maintain terrain and obstruction clearance, instruct the pilot to maintain VFR and to state intentions.
4. If appropriate, apply the provisions of paragraphs 9-2-10, VFR AIRCRAFT IN DIFFICULTY, para 9-2-12, ATS SURVEILLANCE ASSISTANCE TECHNIQUES, as necessary.

4-2-6 CLEARANCE ITEMS

The following guidelines shall be utilized to facilitate the processing of airfile aircraft:

a. Ensure the aircraft is within your area of jurisdiction unless otherwise coordinated.
b. Obtain necessary information needed to provide IFR service.
c. Issue clearance to destination, short range clearance, or an instruction to the pilot to contact an appropriate unit if the flight plan cannot be processed. If clearance is to destination aerodrome/airport, the phraseology CLEARED TO (destination) AERODROME must be used. If clearance is to a NAVAID, state the name of the NAVAID followed by the type of NAVAID, if the type is known. If clearance is to an intersection or waypoint and the type is known, the type must follow the intersection or waypoint name.

NOTE—

These guidelines do not imply that the processing of airfiles has priority over another ATC duty to be performed.

REFERENCE—

RECORDING INFORMATION, Para 2-2-1.

Section 3. DEPARTURE PROCEDURES

4-3-1 DEPARTURE TERMINOLOGY

The expression TAKE-OFF shall only be used in radiotelephony when an aircraft is cleared for take-off or when cancelling a take-off clearance. Use other terms such as “depart,” “departure,” or “fly” in clearances when necessary.

NOTE—

The expression TORA/TODA, pronounced TOR-AH/ TOR-DA, may be used to indicate take-off run available or take-off distance available.

REFERENCE—

TAKEOFF CLEARANCE, Para 3-9-10.

CANCELLATION OF TAKEOFF CLEARANCE, Para 3-9-11.

4-3-2 DEPARTURE CLEARANCES

Include the following items in IFR departure clearances:

a. Clearance Limit.

1. Specify the destination aerodrome when practicable, even though it is outside controlled airspace. Issue short range clearances as provided in any procedures established for their use.

(a) When the clearance limit is an aerodrome, the word “aerodrome” must follow the aerodrome name.

PHRASEOLOGY:

CLEARED TO (destination) AERODROME.

(b) When the clearance limit is a NAVAID and the NAVAID type is known, the type of NAVAID must follow the NAVAID name.

PHRASEOLOGY:

CLEARED TO (NAVAID name and type).

(c) When the clearance limit is an intersection or waypoint and the type is known, the type must follow the intersection or waypoint name.

PHRASEOLOGY:

CLEARED TO (intersection or waypoint name and type).

2. For Presidential and Vice-presidential international flight operations, do not specify the destination aerodrome.

PHRASEOLOGY:

CLEARED TO DESTINATION AERODROME.

b. Departure Procedures:

1. At specific aerodrome where initial heading/azimuth has been approved by appropriate authority, specify direction of takeoff/turn or initial heading/azimuth to be flown after takeoff.

2. When IFR departure procedures are published for a location and pilot compliance is necessary to ensure separation, include the published departure procedure as part of the ATC clearance.

NOTE—
IFR takeoff minimums and departure procedures are prescribed for specific aerodromes/runways and published in Taipei FIR Aeronautical Information Publication. (AIP)

3. Compatibility with a procedure issued may be verified by asking the pilot if items obtained/solicited will allow him/her to comply with local traffic circuit, terrain, or obstruction avoidance.

PHRASEOLOGY:

FLY RUNWAY HEADING.

DEPART (direction or runway).

TURN LEFT/RIGHT.

WHEN ENTERING CONTROLLED AIRSPACE (instruction), FLY HEADING (degrees) UNTIL REACHING (level, point, or fix) BEFORE PROCEEDING ON TRACK.

FLY A (degree) BEARING/AZIMUTH FROM/TO (fix) UNTIL (time),

or

UNTIL REACHING (fix or level), and if required,

BEFORE PROCEEDING ON TRACK.

EXAMPLE:

"Confirm right turn after departure will allow compliance with local traffic circuit," or "Confirm this clearance will allow compliance with terrain or obstruction avoidance."

NOTE—

If a published IFR departure procedure is not included in an ATC clearance, compliance with such a procedure is the pilot's prerogative

4. SIDs:

(a) Assign a SID, if applicable.

PHRASEOLOGY:

[CLEARED] (SID name) DEPARTURE.

EXAMPLE:

"Donna One Alfa Departure."

"Cleared Charlie One Alfa RNAV Departure."

NOTE—

If a pilot does not wish to use a SID issued in an ATC clearance or any other SID published for that location, ATC should be advised.

(b) When a departing aircraft is vectored or cleared to proceed to a point that is not on the SID, all the published speed and level restrictions of the SID are cancelled and the controller shall:

(1) reiterate the cleared level;

(2) provide speed and level restrictions as necessary; and

(3) notify the pilot if it is expected that the aircraft will be instructed to subsequently rejoin the SID.

(c) ATC instructions to an aircraft to rejoin a SID shall include:

(1) the designator of the SID to be rejoin, unless advance notification of rejoin has been provided in accordance with (b);

(2) the cleared level in accordance with (b); and

(3) the position at which it is expected to rejoin the SID.

EXAMPLE:

① *D610 was previously cleared "climb via Paras Two Alfa RNAV Departure, maintain five thousand", shortly after airborne ATC vector D610 to avoid traffic "D610, turn right heading*

two seven zero vector for traffic, climb and maintain one zero thousand, expect to rejoin SID."

D610 will turn right heading 270° and climb to 10,000 feet. All SID restrictions are cancelled. The pilot will retain the SID in the FMS for future rejoin instructions.

② *After a while ATC instruct D610 back to SID "D610, proceed direct Whiskey Papa five five three, rejoin SID, climb via SID, maintain one zero thousand." D610 will climb to 10,000 feet, proceed direct to Whiskey Papa five five three to rejoin SID and comply with all published level and speed restrictions at and after Whiskey Papa five five three.*

c. Route of flight – Specify one or more of the following:

1. Airway, route, track, heading, azimuth, arc, or vector.
2. The routing a pilot can expect if any part of the route beyond a short range clearance limit differs from that filed.

PHRASEOLOGY:

EXPECT FURTHER CLEARANCE VIA (airways, routes, or fixes).

d. Level

NOTE—

Turbojet aircraft equipped with afterburner engines may occasionally be expected to use afterburning during their climb to the en route altitude. When so advised by the pilot, the controller may be able to plan his traffic to accommodate the high performance climb and allow the pilot to climb to planned level without restriction.

1. Clearances to aircraft on a SID with remaining published level and/or speed restrictions shall indicate if such restrictions are to be followed or are cancelled. The following PHRASEOLOGIES shall be used with the following meanings:

PHRASEOLOGY:

(a) **CLIMB VIA SID/(SID name), MAINTAIN *(level)*:**

(1) climb to the cleared level and comply with published level restrictions;

(2) follow the lateral profile of the SID; and

(3) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

EXAMPLE:

"Climb via Tinho One Alfa RNAV Departure, maintain five thousand."

"Climb via SID, maintain flight level two two zero."

(b) **CLIMB VIA SID/(SID name), MAINTAIN *(level)*, CANCEL LEVEL RESTRICTION(S):**

(1) climb to the cleared level, published level restrictions are cancelled;

(2) follow the lateral profile of the SID; and

(3) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

EXAMPLE:

"Climb via SID, maintain flight level two two zero, cancel level restrictions."

(c) **CLIMB VIA SID/(SID name), MAINTAIN *(level)*, CANCEL LEVEL RESTRICTION(S) AT *(point(s))***:

(1) climb to the cleared level, published level restriction(s) at the specified point(s) are cancelled;

(2) follow the lateral profile of the SID; and

(3) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

EXAMPLE:

"Climb via Paras Two Alfa RNAV Departure, maintain flight level two two zero, cancel level restriction at Whiskey Papa five five three."

2. If there are no remaining published level or speed restrictions on the SID, the phrase **CLIMB AND MAINTAIN *(level)*** should be used.

3. When a departing aircraft is cleared to proceed direct to a published waypoint on the SID, the speed and level restrictions associated with the bypassed waypoints are cancelled. All remaining published speed and level restrictions shall remain applicable.

EXAMPLE:

D610 was previously cleared "climb via Paras Two Alfa RNAV Departure, maintain five thousand", shortly after airborne ATC instruct "D610 proceed direct Whiskey Papa five five three, climb via SID, maintain one zero thousand". D610 is not required to comply with the published level or speed restrictions at waypoints being by-passed, however must follow the restrictions at and after Whiskey Papa five five three.

4. When assigning a level, use one of the following in the order of preference listed:

(a) Assign the level requested by the pilot.

(b) Assign a level, as near as possible to the level requested by the pilot, and

(1) Inform the pilot when to expect clearance to the requested level unless instructions are contained in the specified SID, or

(2) If the requested level is not expected to be available, inform the pilot what level can be expected and when/where to expect it.

PHRASEOLOGY:

EXPECT *(the requested level or a level different from the requested level)* ***AT*** *(time or fix),*

and if applicable,

(pilot's requested level) ***IS NOT AVAILABLE****.*

EXAMPLE:

① *A pilot has requested flight level 370. Flight level 270 is immediately available and flight level 370 will be available at the Anbu zero five zero radial 35 mile fix. The clearance will read:*

"Climb and maintain flight level two seven zero. Expect flight level three seven zero at Anbu zero five zero radial three five mile fix."

② *A pilot has requested 9,000 feet. A level restriction is required because of unit procedures or requirements. Assign the level and advise the pilot at what fix/time the pilot may expect the requested level. The clearance could read:*

"Climb and maintain five thousand. Expect niner thousand at one zero minutes after departure."

③ *A pilot has requested FL170 which is unavailable. You plan FL150 to be the pilot's highest level prior to descent to the pilot's destination but only FL130 is available until Makung VOR. Advise the pilot of the expected level change and at what fix/time to expect clearance to FL150. The clearance will read:*

"Climb and maintain flight level one three zero. Expect flight level one five zero at Makung. Flight level one seven zero is not available."

EXAMPLE:

① "Dynasty 607, cleared to Hongkong aerodrome, Charlie One Alfa RNAV Departure, Tango Three RNAV Transition, Alfa One. Climb via SID, maintain three thousand. Squawk 6201."

② "Smart Cat 288, cleared to NAHA aerodrome, Hengchun One Alfa RNAV Departure, Juliett Seven

RNAV Transition, Quebec One Three. Climb via SID, maintain flight level two one zero, cancel level restriction at Whiskey Papa five five two. Squawk 2625."

③ "Cathay 410, cleared to Hongkong Aerodrome, Paras Two Alfa RNAV Departure, Tango Seven RNAV Transition, Golf Five Eight One. Climb via SID, maintain flight level two zero zero, cancel level restrictions. Squawk 2625."

4-3-3 DEPARTURE RESTRICTIONS, CLEARANCE VOID TIMES, HOLD FOR RELEASE, AND RELEASE TIMES

Assign departure restrictions, clearance void times, hold for release, or release times when necessary to separate departures from other traffic or to restrict or regulate the departure flow.

REFERENCE—

OVERDUE AIRCRAFT, Para 9-3-1.

RESUMPTION OF OPEARTIONS, Para 9-4-3.

a. Clearance Void Times.

1. When issuing clearance void times at aerodromes not served by control towers, provide alternative instructions requiring the pilots to advise ATC of their intentions no later than 30 minutes after the clearance void time if not airborne.

2. The unit delivering a clearance void time to a pilot shall issue a time check.

PHRASEOLOGY:

CLEARANCE VOID IF NOT OFF BY (clearance void time),

and if required,

IF NOT OFF BY (clearance void time), ADVISE (unit) NOT LATER THAN (time) OF INTENTIONS.

TIME (time in hours, minutes).

b. Hold For Release (HFR).

1. "Hold for release" instructions shall be used when necessary to inform a pilot or a controller that a departure clearance is not valid until additional instructions are received.

2. When issuing hold for release instructions, include departure delay information.

PHRASEOLOGY:

HOLD FOR RELEASE, EXPECT (time in hours and/or minutes) DEPARTURE DELAY.

3. When conditions allow, release the aircraft as soon as possible.

PHRASEOLOGY:

To another controller,

(aircraft identification) RELEASED.

c. Release Times.

1. Release times shall be issued to pilots when necessary to specify the earliest time an aircraft may depart.

NOTE—

A release time is a departure restriction issued to a pilot (either directly or through authorized relay) to separate a departing aircraft from other traffic.

2. The unit issuing a release time to a pilot shall include a time check.

PHRASEOLOGY:

(Aircraft identification) RELEASED AFTER (time in hours and/or minutes),/

(Aircraft identification) RELEASED FOR DEPARTURE AT (time in hours and/or minutes),and if required,

IF NOT OFF BY (time), ADVISE (unit) NOT LATER THAN (time) OF INTENTIONS.

TIME (time in hours, minutes).

4-3-4 DELAY SEQUENCING

When aircraft elect to take delay on the ground before departure, issue departure clearances to them in the order in which the requests for clearance were originally made if practicable.

4-3-5 FORWARD DEPARTURE DELAY INFORMATION

Inform approach control units and/or towers of anticipated departure delays.

4-3-6 COORDINATION WITH ACCEPTING UNIT

a. Coordinate with the accepting unit before the departure of an aircraft if the departure point is less than 15 minutes flying time from the transferring unit's boundary unless an automatic transfer of data between automated systems will occur, in which case, the flying time requirement may be reduced to 5 minutes or replaced with a mileage from the boundary parameter when mutually agreeable to both units.

NOTE—

Agreements requiring additional time are encouraged between units that need earlier coordination. However, when agreements establish mandatory radar handoff procedures, coordination need only be effected in a timely manner prior to transfer of control.

REFERENCE—

APPLICATION, Para 5-4-1.

b. The actual departure time or a subsequent strip posting time shall be forwarded to the accepting unit unless assumed departure times are agreed upon and that time is within 3 minutes of the actual departure time.

4-3-7 VFR RELEASE OF IFR DEPARTURE-MILITARY

When an aircraft which has filed an IFR flight plan requests a VFR departure through a terminal unit.

a. After obtaining, if necessary, approval from the unit/sector responsible for issuing the IFR clearance, you may authorize an IFR flight planned aircraft to depart VFR. Inform the pilot of the proper frequency and, if appropriate, where or when to contact the unit responsible for issuing the clearance.

PHRASEOLOGY:

VFR DEPARTURE AUTHORIZED, CONTACT (unit) On (frequency) AT (location or time if required) FOR CLEARANCE.

b. If the unit /sector responsible or issuing the clearance is unable to issue a clearance, inform the pilot, and suggest that the delay be taken on the ground. If the pilot insists upon taking off VFR and obtain an IFR clearance in the air, inform the unit /sector holding the flight plan of the pilot’s intentions and, if possible, the VFR departure time.

4-3-8 FORWARDING DEPARTURE TIMES

TERMINAL

Unless alternate procedures are prescribed in a letter of agreement or automatic departure messages are being transmitted between automated units, forward departure times to the unit from which you received the clearance and also to the terminal departure controller when that position is involved in the departure sequence.

NOTE—

Letters of agreement prescribing assumed departure times or mandatory radar handoff procedures are alternatives for providing equivalent procedures.

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Section 4. ROUTE ASSIGNMENT

4-4-1 ROUTE USE

Clear aircraft via routes consistent with the level stratum in which the operation is to be conducted by one or more of the following:

REFERENCE—

NAVAID TERMS, Para 2-5-2.

EXCEPTIONS, Para 4-1-2.

MINIMUM EN ROUTE ALTITUDE, Para 4-5-5.

APPLICATION, Para 5-6-1.

a. Designated ATS routes.

PHRASEOLOGY:

VIA (alphabet) (airway number)

b. Radials, tracks, or direct to or from NAVAIDs.

PHRASEOLOGY:

DIRECT.

VIA:

(name of NAVAID) (specified) RADIAL/TRACK,

or

(fix) AND (fix).

or

RADIALS OF (airways or route) AND (airways or route)

c. DME arcs of VORTAC or TACAN aids.

PHRASEOLOGY:

VIA (distance) DME ARC (direction) OF (name of DME station);

d. Radials, tracks, azimuths, and headings of departure or arrival routes.

e. SIDs/STARs.

f. Vectors.

g. Fixes defined in terms of degree-distance from NAVAIDs for special military operations.

h. Tracks, bearings, quadrants, or radials within a radius of a NAVAID.

PHRASEOLOGY:

CLEARED TO FLY (general direction from NAVAID) OF (NAVAID name and type) BETWEEN (specified) TRACKS TO/BEARINGS FROM/RADIALS (NAVAID name when a NDB) WITHIN (number of miles) MILE RADIUS,

or

CLEARED TO FLY (specified) QUADRANT OF (NAVAID name and type) WITHIN (number of miles) MILE RADIUS.

EXAMPLE:

① *"Cleared to fly east of Hengchun VORTAC between the zero four five and the one three five radials within four zero mile radius."*

② *"Cleared to fly east of Lima Uniform radio beacon between the two two five and the three one five*

tracks to Lima Uniform radio beacon within three zero mile radius."

③ "Cleared to fly northeast quadrant of Houlong VORTAC within four zero mile radius."

i. Fixes/waypoints defined in terms of:

1. Published name; or
2. Degree-distance from NAVAIDs; or
3. Latitude/longitude coordinates, state the latitude and longitude in degrees and minutes including the direction from the axis such as North or West; or
4. Offset from published or established ATS route at a specified distance and direction for random (impromptu) RNAV Routes.

PHRASEOLOGY:

DIRECT (fix/waypoint).

DIRECT TO THE (facility) (radial) (distance) FIX.

DIRECT (number degrees) DEGREES, (number minutes) MINUTES (north), (number degrees) DEGREES, (number minutes) MINUTES (east).

PROCEED OFFSET (distance) RIGHT/LEFT OF (route) (track)[CENTER LINE] [AT (significant point or time)] [UNTIL (significant point or time)].

CANCEL OFFSET (instructions to rejoin cleared flight route or other information).

EXAMPLE:

"Direct KADLO."

"Direct to the HCN one eight zero radial one five mile fix."

"Direct 25 degrees, 01 minutes north, 121 degrees, 33 minutes east."

"Proceed offset 10 miles right of Mike Seven Five Zero."

REFERENCE—

AIRCRAFT EQUIPMENT SUFFIX, Para 2-3-3.

NAVAID FIXES, Para 2-5-3.

APPLICATION, Para 5-5-1.

4-4-2 ROUTE STRUCTURE TRANSITIONS

To effect transition within or between route structure, clear an aircraft by one or more of the following methods, based on NAVAIDs or RNAV:

a. Vector aircraft to or from radials, tracks, or azimuths of the airway or route assigned.

b. Assign a SID/STAR.

c. Clear departing or arriving aircraft to climb or descend via radials, tracks, or azimuths of the airway assigned.

d. Clear departing or arriving aircraft directly to or between the NAVAIDs forming the airway or route assigned.

e. Clear aircraft to climb or descend via the airway or route on which flight will be conducted.

f. Clear aircraft to climb or descend on specified radials, tracks, or azimuths of NAVAIDs.

g. Clear RNAV aircraft transitioning to or between designated or established RNAV routes direct to a named waypoint on the new route.

4-4-3 ALTERNATIVE ROUTES

When any part of an airway or route is unusable because of NAVAID status, clear aircraft via one of the following alternative routes:

a. A route depicted on current AIP publications.

b. A route defined by specifying NAVAID radials, tracks, or azimuths.

c. A route defined as direct to or between NAVAID's.

d. Vectors.

NOTE—

Inform area navigation aircraft that proceed to the NAVAID location of the NAVAID outage.

4-4-4 CLASS G AIRSPACE

Include routes through class G airspace only when requested by the pilot.

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Section 5. LEVEL ASSIGNMENT AND VERIFICATION

4-5-1 VERTICAL SEPARATION MINIMA

Separate instrument flight rules (IFR) aircraft using the following minima between levels:

a. Up to and including FL 410 - 1,000 feet.

b. Apply 2,000 feet at or above FL 290 between non−RVSM aircraft and all other aircraft at or above FL 290.

c. Above FL 410 − 2,000 feet, except above FL 600 between military aircraft − 5,000 feet.

REFERENCE—

VERTICAL APPLICATION, Para 5-5-5.

APPLICATION, Para 6-6-1.

4-5-2 FLIGHT DIRECTION

Clear aircraft at levels according to the TBL 4-5-1.

TBL 4-5-1 Level Assignment

Aircraft Operating	*On track degrees magnetic*	*Assign*	*Examples*
Below 3,000 feet above surface	Any track	Any level	
At and below FL410	0 through 179	Odd cardinal level or flight level at intervals of 2,000 feet	3,000, 5,000, FL310, FL330
	180 through 359	Even cardinal level or flight level at intervals of 2,000 feet	4,000, 6,000, FL320, FL340
Above FL410	0 through 179	Odd cardinal flight level at intervals of 4,000 feet beginning with FL450	FL450, FL490, FL530
	180 through 359	Odd cardinal flight level at intervals of 4,000 feet beginning with FL430	FL430, FL470, FL510
One way route	Any track	Any cardinal level or flight level below FL410 or any odd cardinal flight level above FL410	FL270, FL280, FL290, FL300, FL310, FL410, FL430, FL450
Within an ALTRV	Any track	Any level or flight level	
One way route	Clear aircraft at altitudes according to this table or regional navigation agreement.		
Aircraft within RVSM or RVSM transition airspace	Clear aircraft at altitudes according to this table or regional navigation agreement.		

REFERENCE—

EXCEPTIONS, Para 4-5-3.

4-5-3 EXCEPTIONS

When traffic, meteorological conditions, or aircraft operational limitations prevent assignment of levels prescribed in paragraph 4-5-2, FLIGHT DIRECTION, assign any cardinal level or flight level below FL 410

or any odd cardinal flight level at or above FL 410 without regard to direction of flight as follows:

NOTE—
See paragraph 2-3-4, CONTROL SYMBOLOGY, for control abbreviations and symbols to be used in conjunction with this paragraph.

a. For traffic conditions, take this action only if one of the following conditions exists:
   1. Aircraft remain within a unit's area and prior approval is obtained from other affected positions or sectors or the operations are covered in a Unit Directive.
   2. Aircraft will proceed beyond the unit's area and specific operations and procedures permitting random level assignment are covered in a letter of agreement between the appropriate units.

b. Military aircraft are operating on random routes and prior approval is obtained from the unit concerned.

c. For meteorological conditions, take this action only if you obtain prior approval from other affected positions or sectors within your unit and, if necessary, from the adjacent unit concerned.

d. For aircraft operational limitations, take this action only if the pilot informs you the available appropriate level exceeds the operational limitations of his aircraft and only after you obtain prior approval from other affected positions or sectors within your unit and, if necessary, from the adjacent unit concerned.

4-5-4 LOWEST USABLE FLIGHT LEVEL

If a change in atmospheric pressure affects a usable flight level in your area of jurisdiction, use TBL 4-5-2 to determine the lowest usable flight level to clear aircraft at or above 13,000 feet MSL. For mountainous area, disregarding the change in atmospheric pressure, FL 160 is the Lowest Usable FL.

TBL 4-5-2 Lowest Usable FL

Altimeter Setting	*Lowest Usable FL*
979.3hPa (28.92") or higher	130
979.0 – 945.5hPa (28.91" to 27.92")	140

4-5-5 MINIMUM EN ROUTE ALTITUDES

Except as provided in subparas a. below, assign levels at or above the MEA for the route segment being flown. When a lower MEA for subsequent segments of the route is applicable, issue the lower MEA only after the aircraft is over or past the Fix/NAVAID beyond which the lower MEA applies unless a crossing restriction at or above the higher MEA is issued.

a. An aircraft may be cleared below the MEA but not below the MOCA for the route segment being flown if the level assigned is at least 300 feet above the floor of controlled airspace and one of the following conditions are met:

   NOTE—

   Controllers must be aware that in the event of radio communications failure, a pilot will climb to the MEA for the route segment being flown.

   1. Nonradar procedures are used only within 22 miles of a VOR, VORTAC, or TACAN.
   2. Radar procedures are used only when an operational advantage is realized and the following actions are taken:
      (a) Radar navigational guidance is provided until the aircraft is within 22 miles of the NAVAID, and
      (b) Lost communications instructions are issued.

b. Where a higher level is required because of an MEA, the aircraft shall be cleared to begin climb to the higher MEA as follows:
   1. If no MCA is specified, prior to or immediately after passing the fix where the higher MEA is

designated (see FIG 4-5-1).

2. If a MCA is specified, prior to the fix so as to cross the fix at or above the MCA (see FIG 4-5-2).

FIG 4-5-1**No MCA Specified**

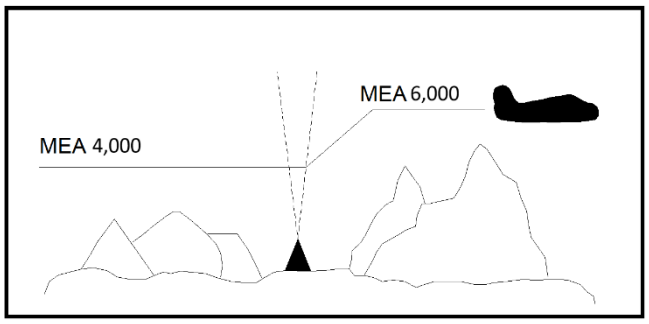
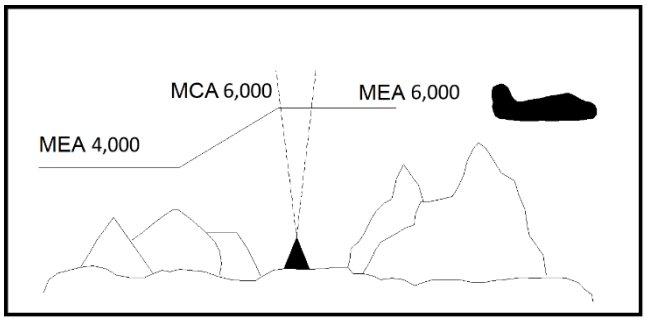


FIG 4-5-2 **MCA Specified**



c. Where MEA's have not been established, clear an aircraft at or above the minimum altitude for IFR operations prescribed by "Rules of the Air" Article 71.

REFERENCE—

IFR-VFR AND VFR-IFR FLIGHTS, Para 4-2-5.

ROUTE USE, Para 4-4-1.

APPLICATION, Para 5-6-1.

4-5-6 LEVEL INFORMATION

Issue level clearances and restrictions as follows:

REFERENCE—

CLEARANCE MESSAGE, Para 4-2-1.

a. Level assignment shall take into account:

1. Separation
2. Terrain clearance
3. Provision for radio failure
4. Priority.

b. Level to maintain. Unless cruise climb or block level *(see subpara d.)* has been coordinated, assign only one level to an aircraft that will go beyond your area of control.

PHRASEOLOGY:

MAINTAIN (level)

REFERENCE—

CLEARANCE MESSAGE, Para 4-2-1

c. Instructions to climb or descend including restrictions, as required:

PHRASEOLOGY:

CLIMB/DESCEND AND MAINTAIN (level)

WHEN READY, CLIMB/DESCEND AND MAINTAIN (level)

EXPECT CLIMB/DESCENT AT (time, fix, waypoint, distance)

MAINTAIN (level) UNTIL (time, fix, waypoint, distance)

CROSS (fix, waypoint) AT/ABOVE/BELOW(level)

CROSS (fix, waypoint) AT OR ABOVE/AT OR BELOW(level)

INTERCEPT (route) AT OR ABOVE (level)

AFTER PASSING (fix, waypoint), CLIMB/DESCEND AND MAINTAIN (level)

AT (time) CLIMB/DESCEND AND MAINTAIN (level)

CLIMB/DESCEND TO REACH (level) AT (time, fix, waypoint, distance)

EXAMPLE:

"When ready descend and maintain six thousand. Cross Houlong below one zero thousand."

"Descend to reach flight level two zero zero at Drake."

REFERENCE—

WORD MEANINGS, Para 1-2-1.

NUMBERS USAGE, Para 2-4-18.

d. Clearance for cruise climb or block level clearance

PHRASEOLOGY:

CRUISE CLIMB BETWEEN (levels) (or ABOVE (levels))

MAINTAIN BLOCK (level) THROUGH (level)

e. Instructions to vertically navigate SIDs/STARs with published crossing restrictions (Climb Via/Descend Via):

1. When established on the SID/STAR.
2. When navigating a published route inbound to the STAR.

PHRASEOLOGY:

DESCEND VIA (STAR name), MAINTAIN (level).

CLIMB VIA (SID name), MAINTAIN (level).

EXAMPLE:

"Descend via Lugia One Alfa RNAV Arrival maintain three thousand."

"Descend via Lugia One Alfa RNAV Arrival, maintain three thousand. Runway 09."

"*Climb via Paras Two Alfa RNAV Departure, maintain flight level two zero zero*."

REFERENCE—

DEPARTURE CLEARANCES, Para 4-3-2.

CLEARANCE INFORMATION, Para 4-7-1.

f. When a pilot is unable to accept a clearance, issue revised instructions to ensure positive control and approved separation.

NOTE—

① *"Rules of the Air" Article 42 states that a pilot is not allowed to deviate from an ATC clearance except when an emergency exists.*

② *A pilot is therefore expected to advise the controller if a clearance cannot be accepted when the clearance issued. "We will try" and other such acknowledgements do not constitute pilot acceptance of an ATC clearance.*

③ *Controllers are expected to issue ATC clearances which conform to normal operational capabilities for each aircraft and which do not require "last minute" amendments to ensure approved separation.*

④ *"Expedite" is not to be used in lieu of appropriate restrictions to ensure separation.*

REFERENCE—

PROVIDING ASSISTANCE, Para 9-1-3.

4-5-7 ANTICIPATED LEVEL CHANGES

If practicable, inform an aircraft when to expect climb or descent clearance or to request level change from another unit.

PHRASEOLOGY:

EXPECT HIGHER/LOWER LEVEL IN (number of miles or minutes) MILES/MINUTES

or

AT (fix).

REQUEST LEVEL CHANGE FROM (name of unit).

If required,

AT (time, fix, or level).

REFERENCE—

IFR FLIGHT PROGRESS DATA, Para 2-2-5.

4-5-8 LEVEL CONFIRMATION-NONRADAR

Request a pilot to confirm assigned level on initial contact, and when position reports are received unless:

NOTE—

For the purpose of this paragraph, "initial contact" means a pilot's first radio contact with each sector/position.

a. The pilot states the assigned level, or

b. You assign a new level to a climbing or descending aircraft, or

c. ***TERMINAL*:** The aircraft was transferred to you from another sector/position within your unit.

PHRASEOLOGY:

(In level flight situations,) CONFIRM MAINTAINING (level).

(In climbing/descending situations,) CONFIRM CLIMBING/DESCENDING TO (level)

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Section 6. HOLDING AIRCRAFT

4-6-1 CLEARANCE TO HOLDING FIX

Consider operational factors such as length of delay, holding airspace limitations, navigational aids, level, meteorological conditions when necessary to clear an aircraft to a fix other than the destination aerodrome. Issue the following:

a. Clearance limit. (if any part of the route beyond a clearance limit differs from the last routing cleared, issue the route the pilot can expect beyond the clearance limit).

PHRASEOLOGY:

EXPECT FURTHER CLEARANCE VIA (routing).

EXAMPLE:

"Expect further clearance via Anbu, Whiskey Four, Houlong, direct Dalin."

b. Holding instructions.

1. Holding instructions may be eliminated when you inform the pilot that no delay is expected.
2. When the pattern is charted, you may omit all holding instructions except the charted holding direction and the statement "as published." Always issue complete holding instructions when the pilot requests them.

PHRASEOLOGY:

CLEARED TO (fix), HOLD (direction), AS PUBLISHED,

or

CLEARED TO (fix), NO DELAY EXPECTED.

c. EFC. Do not specify this item if no delay is expected.

1. When additional holding is expected at any other fix in your unit's area, state the fix and your best estimate of the additional delay. When more than one fix is involved, state the total additional en route delay (omit specific fixes).

NOTE—

Additional delay information is not used to determine pilot action in the event of two-way communications failure. Pilots are expected to predicate their actions solely on the provisions of "Rules of the Air" Article 50.

PHRASEOLOGY:

EXPECT FURTHER CLEARANCE AT (time),

and if required,

ANTICIPATE ADDITIONAL (time in minutes/hours) MINUTE/HOUR DELAY AT (fix).

or

ANTICIPATE ADDITIONAL (time in minutes/hours) MINUTE/HOUR EN ROUTE DELAY.

EXAMPLE:

"Expect further clearance at zero two two zero, anticipate additional three zero minute delay at Anbu."

"Expect further clearance at zero two one zero, anticipate additional three zero minute en route delay."

2. When additional holding is expected in an approach control area, state the total additional terminal delay.

PHRASEOLOGY:

EXPECT FURTHER CLEARANCE AT (time),

and if required,

ANTICIPATE ADDITIONAL (time in minutes/hours) MINUTE/HOUR TERMINAL DELAY.

3. ***TERMINAL*:** When terminal delays exist or are expected, inform the appropriate center or approach control unit so that the information can be forwarded to arrival aircraft.

4. When delay is expected issue items in subparagraphs 4-6-1 a. and b. at least 5 minutes before the aircraft is estimated to reach the clearance limit. If the traffic situation requires holding an aircraft that is less than 5 minutes from the holding fix, issue these items immediately.

***NOTE*—**

① *The pilots should start speed reduction when 3 minutes or less from the holding fix. The additional 2 minutes contained in the 5-minute requirement are necessary to compensate for different pilot/controller ETAs at the holding fix, minor differences in clock times, and provision for sufficient planning and reaction times.*

② *When holding is necessary, the phrase "delay indefinite" should be used when an accurate estimate of the delay time and the reason for the delay cannot immediately be determined; i.e., disabled aircraft on runway, terminal or center sector saturation, weather below landing minimums, etc. In any event, every attempt should be made to provide the pilot with the best possible estimate of his delay time and the reason for the delay. Controllers/supervisors should consult, as appropriate, with personnel (other sector, weather forecasters, the aerodrome management, other units, etc.) who can best provide this information.*

PHRASEOLOGY:

DELAY INDEFINITE, (reason if known), EXPECT FURTHER CLEARANCE AT (time).

(After determining the reason for the delay, advise the pilot as soon as possible.)

EXAMPLE:

"Cleared to Anbu, hold northeast as published, expect further clearance via Bravo Five Niner One, anticipate additional two zero minute delay at Tinho."

"Cleared to Sedum, no delay expected."

"Cleared to Lin Kou, hold east as published, delay indefinite, F.O.D. removal in progress, expect further clearance at one one three zero."

"Cleared to Kizin, hold west as published, seven mile leg, right turns, expect further clearance at zero one two zero, anticipate additional one five minute terminal delay."

4-6-2 CLEARANCE BEYOND FIX

a. If no delay is expected, issue a clearance beyond the clearance limit as soon as possible and, whenever possible, at least 5 minutes before the aircraft reaches the fix.

b. Include the following items when issuing clearance beyond a clearance limit:

1. Clearance limit or approach clearance.

2. Route of flight. Specify one of the following:

(a) Complete details of the route (airway, route, course, fix(s), azimuth course, heading, arc, or vector).

(b) The phrase "via last routing cleared." Use this phrase only when the most recently issued routing to the new clearance limit is valid and verbiage will be reduced.

PHRASEOLOGY:

VIA LAST ROUTING CLEARED.

3. Assigned level if different from present level.

NOTE—

Except in the event of a two-way communications failure, when a clearance beyond a fix has not been received, pilots are expected to maintain the last assigned level and to hold as depicted on the appropriate charts. If no holding pattern is charted and holding instructions have not been issued, pilots should ask ATC for holding instructions prior to reaching the fix. If a pilot is unable to obtain holding instructions prior to reaching the fix, he is expected to hold in a standard pattern on the track on which he approached the fix and request onwards clearance as soon as possible.

4-6-3 DELAYS

a. Advise your supervisor as soon as possible when you delay or expect to delay aircraft.

b. When arrival delays reach or are anticipated to reach 30 minutes, take the following action:

1. ***EN ROUTE***: The center responsible for transferring control to an approach control unit or, for an aerodrome control tower, the center in whose area the aircraft will land shall issue total delay information as soon as possible after the aircraft enters the center's area. Whenever possible, the delay information shall be issued by the first center controller to communicate with the aircraft.

2. ***TERMINAL***: The approach control unit whose area contains the destination aerodrome shall issue total delay information as soon as possible after the aircraft enters its control area. Whenever possible, the delay information shall be issued by the first terminal controller to communicate with the aircraft.

3. Unless a pilot requests delay information, the actions specified in 1 and 2 above may be omitted when total delay information is available to pilots via ATIS.

PHRASEOLOGY:

(Aerodrome) ARRIVAL DELAYS (time in minutes/hours).

c. An aircraft should, when practicable, be authorized to absorb a period of notified terminal delay by cruising at a reduced speed for the latter portion of its flight.

d. When extended holding is anticipated, turbojet aircraft should, when practical, be permitted to hold at higher levels in order to conserve fuel, whilst retaining their order in the approach sequence.

e. If the pilot of an aircraft in an approach sequence has indicated an intention to hold for weather improvement, or for other reasons, such action shall be approved. However, when other holding aircraft indicate intention to continue their approach-to-land, the pilot desiring to hold will be cleared to an adjacent fix for holding awaiting weather change or re-routing. Alternatively, the aircraft should be given a clearance to place it at the top of the approach sequence so that other holding aircraft may be permitted to land. Coordination shall be effected with any adjacent ATC unit or control sector, when required, to avoid conflict with the traffic under the jurisdiction of that unit or sector.

4-6-4 HOLDING INSTRUCTIONS

When issuing holding instructions, specify:

a. Direction of holding from the fix/waypoint.

b. Holding fix or waypoint.

NOTE—

The holding fix may be omitted if included at the beginning of the transmission as the clearance limit.

c. Radial, track, bearing, azimuth, airway, or route on which the aircraft is to hold.

d. Leg length in miles if DME or RNAV is to be used. Specify leg length in minutes if the pilot requests it or you consider it necessary.

e. Direction of holding pattern turns only if left turns are to be made, the pilot requests, or you consider it necessary.

f. Issue holding instructions as necessary:

PHRASEOLOGY:

CLEARED (or PROCEED) TO (significant point, name of facility or fix) [MAINTAIN (or CLIMB AND MAINTAIN or DESCEND AND MAINTAIN) (level)] HOLD [(direction)] [(specified) RADIAL, COURSE, INBOUND TRACK (three digits) DEGREES] [RIGHT (or LEFT) HAND PATTERN] [OUTBOUND TIME (number) MINUTES] EXPECT APPROACH CLEARANCE (or FURTHER CLEARANCE) AT (time) (additional instructions, if necessary)

CLEARED TO THE (three digits) RADIAL OF THE (name) VOR AT (distance) DME FIX [MAINTAIN (or CLIMB AND MAINTAIN or DESCEND AND MAINTAIN) (level)] HOLD [(direction)] [RIGHT (or LEFT) HAND PATTERN] [OUTBOUND TIME (number) MINUTES] EXPECT APPROACH CLEARANCE (or FURTHER CLEARANCE) AT (time) (additional instructions, if necessary)

CLEARED TO THE (three digits) RADIAL OF THE (name) VOR AT (distance) DME FIX [MAINTAIN (or CLIMB AND MAINTAIN or DESCEND AND MAINTAIN) (level)] HOLD BETWEEN (distance) AND (distance) DME [RIGHT (or LEFT) HAND PATTERN] EXPECT APPROACH CLEARANCE (or FURTHER CLEARANCE) AT (time) (additional instructions, if necessary)

HOLD (direction) OF (fix/waypoint) ON (specified radial, course, bearing, airway, azimuth(s), or route).

If leg length is specified,

(number of minutes/miles) MINUTE/MILE LEG.

If direction of turn is specified,

LEFT/RIGHT TURNS.

EXAMPLE:

"HOLD NORTHEAST OF ANBU ZERO FIVE TWO RADIAL, ONE ZERO MILE FIX ON ALFA ONE/ANBU ZERO FIVE TWO RADIAL, FIVE MILES LEG, LEFT TURNS."

g. Issue maximum holding speed advisories when an aircraft is:

1. Approved to exceed the maximum speed of a pattern, and is cleared into a holding pattern that will protect for the greater speed; or
2. Observed deviating from the holding pattern airspace area.

NOTE—

Due to turbulence, a turboprop requests to exceed the recommended maximum holding speed. ATC may clear the aircraft into a pattern that protects for the speed request, and shall advise the pilot of the maximum holding speed for the holding pattern airspace area.

EXAMPLE:

"MAXIMUM HOLDING SPEED IS TWO ONE ZERO KNOTS."

4-6-5 VISUAL HOLDING LOCATIONS

You may use as a holding fix a location which the pilot can determine by visual reference to the surface if he is familiar with it.

PHRASEOLOGY:

HOLD AT (location) UNTIL (time or other condition).
HOLD VISUAL [OVER] (position), (or BETWEEN (two prominent (and landmarks))

REFERENCE—

VISUAL HOLDING OF VFR AIRCRAFT, Para 7-1-5.

4-6-6 HOLDING FLIGHT PATH DEVIATION

Approve a pilot's request to deviate from the prescribed holding flight path if obstacles and traffic conditions permit.

4-6-7 ILS PROTECTION/CRITICAL AREAS

When conditions are less than reported ceiling 800 feet and/or visibility of 3,000 meters, do not authorize aircraft to hold below 5,000 feet AGL inbound toward the aerodrome on or within 1,500 meters of the localizer between the ILS OM or the fix used in lieu of the OM and the aerodrome.

NOTE—

MILITARY*: The holding restriction applies only when an arriving aircraft is between the ILS OM or the fix used in lieu of the OM and the runway.*

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Section 7. ARRIVAL PROCEDURES

4-7-1 CLEARANCE INFORMATION

Standard clearances for arriving aircraft shall contain the following items:

a. aircraft identification;

b. Route of flight including a STAR/RNAV STAR, if appropriate. Assign a STAR/RNAV STAR to any aircraft in lieu of other routes; e.g., airways or preferential arrival routes when the routings are the same.

PHRASEOLOGY:

CLEARED (STAR name) ARRIVAL.

EXAMPLE:

"Cleared Yanma One Alfa RNAV Arrival."

"From Tonga to Wuchi."

Note—

If a civil pilot does not wish to use a STAR issued in an ATC clearance or any other STAR published for that location, ATC should be advised.

c. TERMINAL: Runway-in-use, except when part of the STAR description.

d. Clearances to aircraft on a STAR with remaining published level and/or speed restrictions shall indicate if such restrictions are to be followed or are cancelled. The following phraseologies shall be used with the following meaning:

1. **DESCEND VIA STAR/(STAR name), MAINTAIN *(level)***:

(a) descend to the cleared level and comply with published level restrictions;

(b) follow the lateral profile of the STAR; and

(c) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

EXAMPLE:

"Descend via Lugia One Alfa RNAV Arrival, maintain three thousand."

"Descend via STAR, maintain flight level two one zero."

2. **DESCEND VIA STAR/(STAR name), MAINTAIN *(level)*, CANCEL LEVEL RESTRICTION(S)**:

(a) descend to the cleared level; published level restrictions are cancelled;

(b) follow the lateral profile of the STAR; and

(c) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

EXAMPLE:

"Descend via Lugia One Alfa RNAV Arrival, maintain three thousand, cancel level restrictions."

"Descend via STAR, maintain seven thousand, cancel level restrictions."

3. **DESCEND VIA STAR/(STAR name), MAINTAIN (level), CANCEL LEVEL RESTRICTION(S) AT (point(s))**:

(a) descend to the cleared level; published level restriction(s) at the specified point(s) are cancelled;

(b) follow the lateral profile of the STAR; and

(c) comply with published speed restrictions or ATC-issued speed control instructions as applicable.

EXAMPLE:

"Descend via Lugia One Alfa RNAV Arrival, maintain three thousand, cancel level restrictions at Whiskey Papa three four five."

4. If there are no remaining published level or speed restrictions on the STAR, the phrase **DESCEND AND MAINTAIN *(level)*** should be used.
5. When an arriving aircraft is cleared to proceed direct to a published waypoint on the STAR, the speed and level restrictions associated with the bypassed waypoints are cancelled. All remaining published speed and level restrictions shall remain applicable.

EXAMPLE:

TWB671 has previously been cleared to descend via Yanma One Alfa RNAV Arrival to FL200, after passing Yanma, ATC instruct "TWB671, proceed direct Whiskey Papa three eight one, descend via STAR, maintain flight level one four zero."

TWB671 will proceed direct to WP381 and descend to FL140. TWB671 is not required to comply with the published level or speed restrictions at waypoints being bypassed. TWB671 must however comply with all published level and speed restrictions at and after WP381.

e. When an arriving aircraft is vectored or cleared to proceed to a point that is not on the STAR, all the published speed and level restrictions of the STAR are cancelled and the controller shall:

1. reiterate the cleared level;
2. provide speed and level restrictions as necessary; and
3. notify the pilot if it is expected that the aircraft will be instructed to subsequently rejoin the STAR.

f. ATC instructions to an aircraft to rejoin a STAR shall include:

1. the designator of the STAR to be rejoined, unless advance notification of rejoin has been provided in accordance with e.;
2. the cleared level on rejoining the STAR in accordance with d.; and
3. the position at which it is expected to rejoin the STAR.

EXAMPLE:

① *TWB671 has previously been cleared to descend via Yanma One Alfa RNAV Arrival to FL200, after passing Yanma, ATC vectors TWB671 off the STAR. ATC intends that TWB671 will rejoin the STAR. "TWB671, turn left heading two zero zero vector for traffic, descend and maintain flight level one six zero, expect to rejoin STAR at Whiskey Papa tree eight tree."*

TWB671 will turn left heading 200° and descend to FL160. All the STAR restrictions are cancelled. The pilot will retain the STAR in the FMS for future rejoin instructions.

② *After a while, ATC instructs TWB671 back to the STAR. "TWB671, proceed direct Whiskey Papa tree eight tree rejoin STAR, descend via STAR, maintain five thousand."*

③ *TWB671 will descend to 5,000 feet, proceed direct to WP383 to rejoin the STAR and comply with the published level and speed restrictions at and after WP383.*

g. Instructions regarding further communications as appropriate.

REFERENCE—

RADIO COMMUNICATIONS TRANSFER, Para 2-1-18.

4-7-2 ADVANCE DESCENT CLEARANCE

EN ROUTE

Take the following action when exercising control of aircraft landing at an aerodrome located in an adjacent center's control area near the common boundary:

a. Coordinate with the accepting unit for a lower level and issue a clearance to the aircraft as appropriate.

b. Initiate this action at a distance sufficient from destination to allow for normal descent and speed reduction.

4-7-3 RADIO FREQUENCY AND SSR CODE CHANGES FOR MILITARY AIRCRAFT

When military single-piloted turbojet aircraft will conduct an approach wholly or partly in IFR conditions or at night, take the following action:

NOTE—

It is known that the mental distraction and the inadvertent movement of aircraft controls resulting from the pilot's turning, reaching, or leaning to change frequencies can induce spatial disorientation (vertigo).

a. Avoid radio frequency and SSR code changes to the maximum extent that communications capabilities and traffic will permit. However, when changes are required:

   1. Give instructions early enough to allow the change before the aircraft reaches the approach fix or handoff point.
   2. Keep frequency/radar beacon changes to a minimum below 2,500 feet above the surface.
   3. Avoid requiring frequency/radar beacon changes during the time the aircraft is making a turn.

b. When traffic volume requires, a frequency other than the one used by aircraft making approaches may be assigned for use in transferring control to the approach control unit.

TERMINAL

c. If practicable, use a frequency common to both the GCA unit and approach control to minimize frequency changes.

d. When a GCA unit is not able to communicate on a common frequency, a change to a GCA frequency may be authorized.

e. When a nonradar approach will be made, aircraft may be instructed to change to tower frequency when:

   1. The reported ceiling is at or above 1,500 feet and visibility is 5 km or more.
   2. The aircraft reports able to proceed by visual reference to the surface.
   3. The aircraft is cleared for a visual approach.

f. Avoid making frequency/radar beacon changes after an aircraft begins a high level approach.

g. In the event of a missed approach, do not require a frequency/radar beacon change before the aircraft reaches the missed approach level, the MEA, or the MVA.

4-7-4 MILITARY TURBOJET EN ROUTE DESCENT

Provide military turbojet aircraft the same arrival procedures that are provided for non-military turbojet aircraft except:

NOTE—

It is the responsibility of the pilot to request a high level approach if he/she does not want normal arrival handling.

a. An en route descent may be used in a non-radar environment; however, radar capability should exist which will permit the aircraft to be vectored to the final approach course of a published high level instrument approach procedure or PAR/ASR approach. Do not use this procedure if other than normal vectoring delays are anticipated.

b. Prior to issuance of a descent clearance below the highest initial approach fix level established for any high level instrument approach procedure for the destination aerodrome inform the aircraft:

   1. Type of approach to expect.

      EXAMPLE:

"Expect V-O-R approach to Runway Two Three."

2. Radar vectors will be provided to the final approach course.

   EXAMPLE:

   "Expect surveillance/precision Approach to Runway One seven; radar vectors to final approach course /localizer course."

3. Current weather whenever the ceiling is below 1,500 feet or the highest circling minimum whichever is greater, or when the visibility is less than 5 km.

   EXAMPLE:

   "Expect TACAN approach to Runway Zero Five, radar vectors to final approach course. Weather (reported weather)"

c. If ATIS is provided and the pilot advises he has received the current ATIS broadcast before the descent clearance in subparagraph b is issued, omit those items in subparagraph b. that are contained in the broadcast.

d. To avoid requiring an aircraft to fly at low levels for an excessive distance, descent clearance should be issued at a point determined by adding 10 to the first two digits of the flight level.

   EXAMPLE:

   For FL 370, 37 + 10=47 miles.

   NOTE—

   Turbojet en route descents are based on a rate of descent of 4,000 to 6,000 feet per minute.

e. Do not terminate the en route descent of an aircraft without the consent of the pilot except as required by radar outage or an emergency situation.

   REFERENCE—

   LEVEL ASSIGNMENT FOR MILITARY HIGH LEVEL INSTRUMENT APPROACHES, Para 4-8-3.

4-7-5 ARRIVAL INFORMATION

EN ROUTE

a. Forward the following information to aerodrome control towers, when it is specified in a LOA that ACC is responsible for forwarding arrival information, soon enough to permit adjustment of the traffic flow, but not less than 15 minutes before estimated time of arrival or as stated in a letter of agreement:

   1. Aircraft identification.
   2. Type of aircraft.
   3. ETA.
   4. Type of instrument approach procedure the aircraft will execute; or
   5. For SVFR, the direction from which the aircraft will enter Class C, Class D, or Class E surface airspace and any level restrictions that were issued.

   NOTE—

   Specific time requirements are usually stated in a letter of agreement.

b. Forward the following information to approach control units before transfer of control jurisdiction, but not less than 15 minutes before estimated time of arrival or as stated in a letter of agreement:

   NOTE—

   Transfer points are usually specified in a letter of agreement.

   1. Aircraft identification.

2. Type of aircraft and appropriate aircraft equipment suffix.
3. ETA or actual time, and proposed or actual level over clearance limit. The ETA need not be given if the arrival information is being forwarded during a radar handoff.
4. Requested type of instrument approach if different to that specified by the approach unit.
5. Clearance limit (when other than the destination aerodrome) and EFC issued to the aircraft. Clearance limit may be omitted when provided for in a letter of agreement.
6. Time, fix, or level when control responsibility is transferred to the approach control unit. This information may be omitted when provided for in a letter of agreement.

PHRASEOLOGY:

(Identification), (type of aircraft), ESTIMATED/OVER (clearance limit), (time), (level), EFC(time).

If required,

YOUR CONTROL,

or

YOUR CONTROL AT (time, fix or level).

4-7-6 BELOW MINIMA REPORT BY PILOT

If an arriving aircraft reports weather conditions are below his/her landing minima:

NOTE—

Determination that existing weather/visibility is adequate for approach/ landing is the responsibility of the pilot/aircraft operator.

a. Issue appropriate instructions to the aircraft to hold or proceed to another aerodrome.
b. Adjust, as necessary, the position in the landing sequence of any other aircraft desiring to make approaches and issue approach clearances accordingly.

4-7-7 TRANSFER OF JURISDICTION

Transfer radio communications and control responsibility early enough to allow the accepting unit to clear an aircraft beyond the clearance limit before the aircraft reaches it.

4-7-8 APPROACH INFORMATION

Provide current terminal information, in the order listed, as early as practicable after an aircraft has established communications with the unit providing approach control, with the exception of such elements which contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code.

a. Type of approach and runway-in-use;
b. Meteorological information, as follows:
    1. Surface wind direction and speed, including significant variations.
    2. Visibility, and when applicable, RVR;
    3. Present weather;
    4. Cloud below 5000 ft, or below the highest minimum sector altitude, whichever is the greater, cumulonimbus; if the sky is obscured, vertical visibility when available;
    5. Temperature;
    6. Dew point if so required by regional air navigation agreements;
    7. Altimeter setting;

REFERENCE—

CURRENT SETTINGS, Para 2-7-1

8. Any available information on significant meteorological phenomena in the approach area, e.g. low level wind shear advisories when available;

REFERENCE—

LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES, Para 3-1-8

9. Trend-type landing forecast, when available;

c. Changes in the status of visual and non-visual aids essential for approach and landing.

4-7-9 ARRIVAL INFORMATION BY APPROACH CONTROL UINTS

TERMINAL

a. Forward the following information to aerodrome control towers soon enough to permit adjustment of the traffic flow.

1. Aircraft identification.
2. Type of aircraft.
3. ETA.
4. Type of instrument approach procedure the aircraft will execute;
5. For SVFR, the direction from which the aircraft will enter Class C, Class D, or Class E surface airspace and any level restrictions that were issued.

NOTE—

Specific time requirements are usually stated in a letter of agreement.

b. Forward the following information to the tower when the tower and TRACON are part of the same unit:

1. Aircraft identification.
2. Type of aircraft if required for separation purposes.
3. Type of instrument approach procedure and/ or runway if differing from that in use.

NOTE—

The aerodrome controller has the responsibility to determine whether or not conditions are adequate for the use of label data on the tower ASD where a unit directive authorizes its use for the transfer of arrival data.

c. Forward the following information to centers:

1. Where two or more instrument approach procedures are published for the aerodrome, the particular procedure which an aircraft can expect or that it will be vectored toward the aerodrome for a visual approach.
2. Highest level being used by the approach control unit at the holding fix.
3. Average time interval between successive approaches.
4. Arrival time of aircraft over the holding fix or, if control has been transferred to you before an aircraft has reached the fix, a statement or other indication acknowledging receipt of control responsibility.
5. Revised EFC if different by 10 minutes or more from that issued by the center.
6. Missed approaches if they affect center operations.
7. Information relating to an unreported or overdue aircraft.

4-7-10 AERODROME CONDITIONS

TERMINAL: On first contact or as soon as possible thereafter, and subsequently as changes occur, inform an aircraft of any abnormal operation of approach and landing aids and of destination aerodrome conditions that you know of which might restrict an approach or landing. This information may be omitted if it is contained in the ATIS broadcast and the pilot states the appropriate ATIS code.

REFERENCE—

LANDING AREA CONDITION, Para 3-3-1.

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Section 8. APPROACH CLEARANCE PROCEDURES

4-8-1 APPROACH CLEARANCE

a. Clear aircraft for “standard” or “special” instrument approach procedures only.

1. To authorize a pilot to execute a particular instrument approach procedure:

(a) Specify the name of the approach as published on the approach chart.

(b) Where more than one procedure is published on a single chart and a specific procedure is to be flown, specify the approach to be flown.

(c) If only one instrument approach of a particular type is published, the approach need not be identified by the runway reference.

2. An aircraft conducting an ILS approach when the glidepath (or glideslope) is reported out of service shall be advised at the time an approach clearance is issued unless the title of the published approach procedure allows (for example, ILS or LOC RWY05).

3. Instrument Approach Procedures shall begin at an Initial Approach Fix or an Intermediate Fix if there is not an Initial Approach Fix.

4. Where a STAR/ATS route and an IAP connect at an IAF or IF, and the connection will be used, clear the aircraft for approach at least 3 NM prior to the IAF/IF and specify the name of the connection fix. For arrivals via an ATS Route, assign an altitude to maintain until the connection fix.

5. Where adequate radar coverage exists, radar units may vector aircraft to the final approach course, or clear an aircraft to any fix 3 NM or more prior to the FAF along the final approach course in accordance with paragraph 5-9-1, VECTORS TO FINAL APPROACH COURSE, and paragraph 5-9-2, FINAL APPROACH COURSE INTERCEPTION.

PHRASEOLOGY:

CLEARED (type) APPROACH.

(To authorize a pilot to execute his choice of instrument approach),

CLEARED APPROACH.

(Where more than one procedure is published on a single chart and a specific procedure is to be flown),

CLEARED (specific procedure to be flown) APPROACH.

(To issue an approach clearance when a STAR/ATS route and IAP are directly connected),

At (fix), CLEARED (specific procedure to be flown) APPROACH.

(When it is necessary to cancel a previously issued approach clearance)

CANCEL APPROACH CLEARANCE (additional instructions as necessary).

MILITARY:

(To authorize a pilot to execute an ILS approach when the glidepath (or glideslope) is out of service),

CLEARED ILS APPROACH, GLIDEPATH (or GLIDESLOPE) UNUSABLE.

EXAMPLE:

“Cleared Approach.”

“Cleared (V-O-R/I-L-S/Localizer) Approach.”

“Cleared V-O-R Runway Three Six Approach.”

“Cleared R-NAV Runway Two Two Approach”

“Cleared BAKER One Bravo R-NAV Arrival and (I-L-S/R-NAV) Runway Two Three Left Approach”

“At JAMMY, Cleared RNP Runway 05L Approach.”

"At HLG, Cleared ILS Runway 05L Approach."

"Cross ANKLE at or above 2,500, Cleared ILS Runway 05L Approach."

NOTE—

①*Clearances authorizing instrument approaches are issued on the basis that, if visual contact with the ground is made before the approach is completed, the entire approach procedure will be followed unless the pilot receives approval for a visual approach, or cancels his/her IFR flight plan.*

②*Approach clearances are issued based on known traffic. The receipt of an approach clearance does not relieve the pilot of his/her responsibility to comply with applicable "Rules of the Air" and the notations on instrument approach charts which levy on the pilot the responsibility to comply with or act on an instruction; e.g., "Straight-in minima not authorized at night," "Procedure not authorized when glideslope/glidepath not used," "Use of procedure limited to aircraft authorized to use aerodrome," or" Procedure not authorized at night."*

③*In some case, the name of the approach, as published, is used to identify the approach, even though a component of the approach aid, other than the localizer on an ILS is inoperative.*

④*Where more than one procedure to the same runway is published on a single chart, each must adhere to all final approach guidance contained on that chart, even though each procedure will be treated as a separate entity when authorized by ATC.*

⑤*The use of numerical identifiers in the approach name, or alphabetical identifiers in the approach name with a letter from the end of the alphabet; for example, Z, Y, X, such as "TACAN 1 RWY 36R or ILS Z RWY 10 or ILS Y RWY 10 or "RNAV (GNSS) Z RWY 04 or RNAV (GNSS) Y RWY 04," denotes multiple straight-in approaches to the same runway that use the same approach aid.*

⑥*Alphabetical suffixes with a letter from the beginning of the alphabet; for example, A, B, C, denote a procedure that does not meet the criteria for straight-in landing minimums authorization.*

⑦*Approach name items contained within parenthesis; e.g., RNAV (GNSS) RWY04, are not included in approach clearance phraseology.*

REFERENCE—

ICAO Doc. 8168 Vol. II, Part III, Sec. 5, Chap 1, 1.4.2.5.

⑧*An aircraft which has been cleared to a holding fix and prior to reaching that fix is issued a clearance for an approach, but not issued a revised routing; i.e., "proceed direct to ...." may be expected to proceed via the last assigned route, a feeder route (if one is published on the approach chart), and then to commence the approach as published. If, by following the route of flight to the holding fix, the aircraft would overfly an IAF or the fix associated with the beginning of a feeder route to be used, the aircraft is expected to commence the approach using the published feeder route to the IAF or from the IAF as appropriate; i.e., the aircraft would not be expected to overfly and return to the IAF or feeder route.*

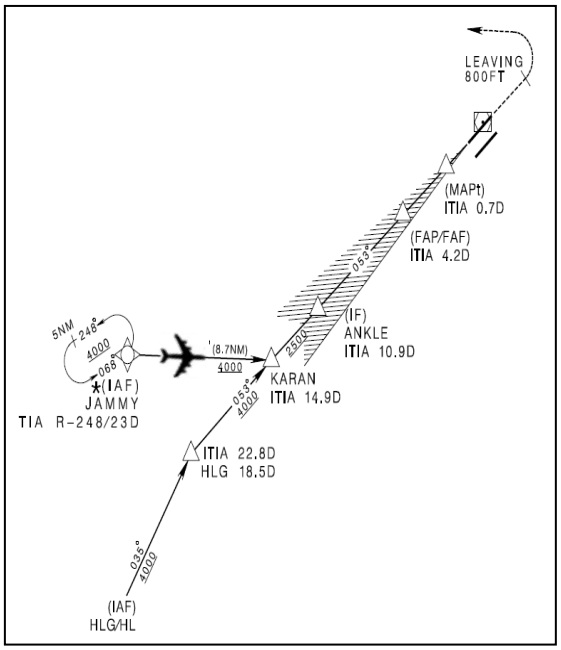
b. *For aircraft operating on unpublished routes, issue the approach clearance only after the aircraft is:*

1. Established on a segment of a published route or instrument approach procedure (see FIG 4-8-1), or

EXAMPLE:

The aircraft is established on a segment of a published route at 5,000 feet. "Cleared ILS Runway Zero Five Left Approach."

FIG 4-8-1 Approach Clearance Example



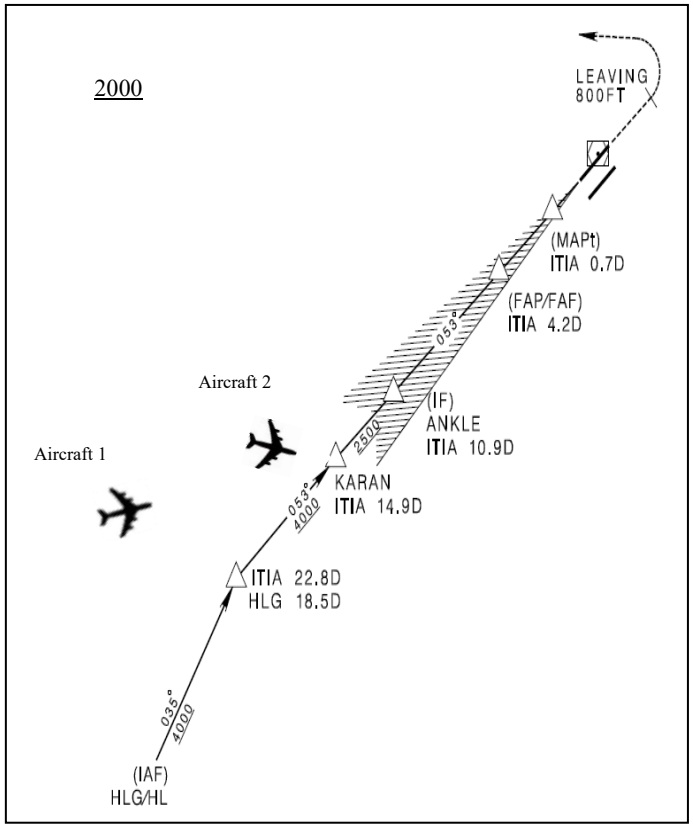
2. Assigned a level to maintain until the aircraft is established on a segment of a published route or instrument approach procedure (See FIG 4-8-2).

   EXAMPLE:

   Aircraft 1 *is cleared direct KARAN. The MVA in the area is 2,000 feet, and the aircraft is at 5,000 feet. "Cross KARAN at or above four thousand, cleared I-L-S Runway Zero Five Left Approach."*

   Aircraft 2 *is at 3,000 feet, the MVA in the area is 2,000 feet. "Cleared direct KARAN direct ANKLE, descend and maintain two thousand five hundred until ANKLE, cleared I-L-S Runway Zero Five Left Approach.", or "turn left heading zero eight zero, descend and maintain two thousand five hundred until ANKLE, cleared I-L-S Runway Zero Five Left Approach."*

FIG 4-8-2 Approach Clearance Example



NOTE—

① *The level 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.*

② *An aircraft is not established on an approach until at or above an altitude published on that segment of the approach.*

REFERENCE—

RADAR ARRIVALS, CHAPTER 5, SECTION 9.

c. Except for visual approaches, do not clear an aircraft direct to the FAF unless it is also an IAF, wherein the aircraft is expected to execute the depicted procedure turn.

d. For both RNAV and conventional approaches, intercept angles greater than 90 degrees may be used when a procedure turn or a holding pattern is depicted and the pilot will execute the procedure.

e. Except when applying radar procedures, timed or visual approaches, clear an aircraft for an approach to an aerodrome when the preceding aircraft has landed or canceled IFR flight plan.

f. Where instrument approaches require ATS surveillance monitoring and service are not available, do not use the phraseology “cleared approach,” which allows the pilot his/her choice of instrument approaches.

g. For RNAV-equipped aircraft operating on unpublished routes, issue approach clearance for conventional or RNAV IAP only after the aircraft is (See FIG 4-8-3):

1. Established on a heading or course direct to the IAF at an intercept angle not greater than 90 degrees and is assigned a level in accordance with b2.

EXAMPLE:

Aircraft 1 *can be cleared direct to CENTR. The intercept angle at that IAF is 90 degrees or less. The minimum altitude for IFR operations along the flight path to the IAF is 3,000 feet. “Cleared direct CENTR, maintain at or above three thousand until CENTR, cleared R−NAV Runway One Eight approach.”*

2. Established on a heading or course direct to the IF at an angle not greater than 90 degrees, provided the following conditions are met:

   (a) Assign a level in accordance with b2 that will permit a normal descent to the FAF.

   NOTE—

   Controllers should expect aircraft to descend at approximately 150-300 feet per nautical mile when applying guidance in subpara g2(a).

   (b) Radar monitoring is provided to the IF.

   (c) The IAP must identify the intermediate fix with the letters "IF."

   (d) For procedures where an IAF is published, the pilot is advised to expect clearance to the IF at least 5 miles from the fix.

   EXAMPLE:

   "Expect direct CENTR for RNAV Runway One-Eight Approach."

3. Established on a heading or course direct to a fix between the IF and FAF, in accordance with Paragraph 5-9-1, Vectors to Final Approach Course, and Paragraph 5-9-2, Final Approach Course Interception, and assigned a level in accordance with b2.

   EXAMPLE:

   Aircraft 1 *is more than 5 miles from SHANN. SHANN is a step down fix between the IF (CENTR) and the FAF. To clear Aircraft 1 to SHANN, ATC must ensure the intercept angle for the intermediate segment at SHANN is not greater than 30 degrees as described in paragraphs 5-9-2 and must be cleared to a level that will allow a normal descent to the FAF. "Expect vectors to SHANN for RNAV Runway One-Eight Approach."*

   "Cleared direct to SHANN, cross SHANN at or above three thousand, cleared RNAV Runway One-Eight Approach."

   REFERENCE—

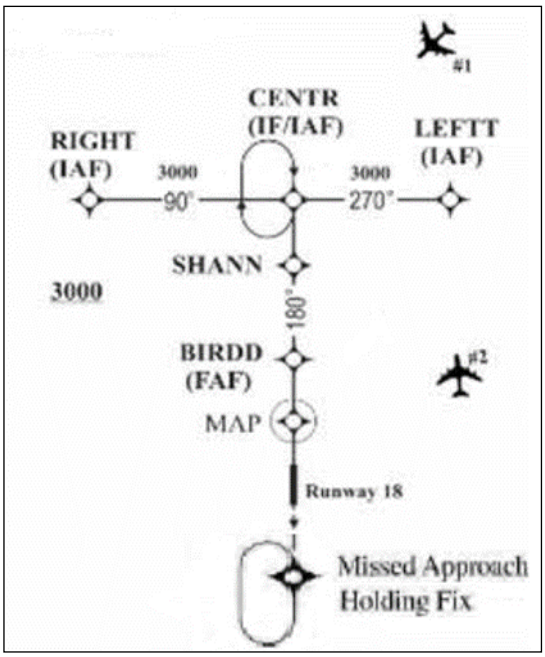
   METHODS, Para 5-6-2

   RADAR ARRIVALS, Chapter 5, Section 9

   NOTE—

   If the IAP chart depicts the procedure shall be commenced from the IAF, the subpara g2 and g3 shall not be applied.

FIG 4-8-3 Approach Clearance Example For RNAV Aircraft



Aircraft 2 *cannot be cleared direct to CENTR unless the aircraft is allowed to execute the holding pattern. The intercept angle at that IF/IAF is greater than 90 degrees. The minimum altitude for IFR operations along the flight path to the IAF is 3,000 feet. "Cleared direct CENTR, maintain at or above three thousand until CENTR, cleared RNAV Runway One Eight approach." The pilot is expected to proceed direct CENTR and execute the holding pattern.*

Aircraft 2 *can be cleared direct LEFTT. The intercept angle at that IAF is 90 degrees or less. The minimum altitude for IFR operations along the flight path to the IAF is 3,000 feet. "Cleared direct LEFTT, maintain at or above three thousand until LEFTT, cleared R-NAV Runway One-Eight approach."*

REFERENCE—

RADAR ARRIVALS, Chapter 5, Section 9.

NOTE—

If necessary, ATC may use "straight-in approach" as a plain language to ensure the aircraft will not conduct a holding pattern.

h. During times when pilots report GNSS anomalies, request the pilot's intentions and/or clear that aircraft for an alternative approach, if available and operational. Announce to other aircraft requesting an RNAV approach that GNSS is reported unavailable and request intentions. The announcement may be omitted if contained in the Automated Terminal Information System (ATIS) broadcast.

REFERENCE—

NAVAID MALFUNCTIONS, 2−1−12

AERODROME CONDITIONS, 4-7-10

4-8-2 APPROACH CLEARANCE TO UNCONTROLLED AIRPORTS

When issuing an approach clearance at locations without an operating control tower or where part-time towers are closed, state the name of the aerodrome.

PHRASEOLOGY:

CLEARED (type) APPROACH TO (aerodrome name).

or

CLEARED APPROACH TO (aerodrome name)

Note—To authorize a pilot to execute his/her choice of instrument approach.

4-8-3 LEVEL ASSIGNMENT FOR MILITARY HIGH LEVEL INSTRUMENT APPROACHES

Levels above those shown on the High Level Instrument Approach Procedures chart may be specified when required for separation.

NOTE—

To preclude the possibility of aircraft exceeding rate-of-descent or airspeed limitations, the maximum levels which may be assigned for any portion of the high level instrument approach procedure will be determined through coordination between the ATC unit concerned and the military authority which originated the high level instrument approach procedure.

REFERENCE—

MILITARY TURBOJET EN ROUTE DESCENT, Para 4-7-4.

4-8-4 SPECIFYING LEVEL

Specify in the approach clearance the level shown in the approach procedures when adherence to that level is required for separation. When vertical separation will be provided from other aircraft by pilot adherence to the prescribed maximum, minimum, or mandatory levels, the controller may omit specifying the level in the approach clearance.

4-8-5 CIRCLING APPROACH

a. Circling approach instructions may only be given for aircraft landing at aerodromes with operational control towers.

b. Include in the approach clearance instructions to circle to the runway in use if landing will be made on a runway other than that aligned with the direction of instrument approach. When the direction of the circling maneuver in relation to the aerodrome/runway is required, state the direction (eight cardinal compass points) and specify a left or right base/downwind leg as appropriate.

PHRASEOLOGY:

CIRCLE TO RUNWAY (number),

or

CIRCLE (direction using eight cardinal compass points) OF THE AERODROME/ RUNWAY FOR A LEFT/ RIGHT BASE/DOWNWIND TO RUNWAY (number).

NOTE—

Where instrument approach procedures (IAPs) authorize circling approaches, they provide a basic minimum of 295 feet of obstacle clearance at the OCA/MDA within the circling area considered. The dimensions of these areas vary for the different approach categories of aircraft. In some cases an IAP may otherwise restrict circling approach maneuvers.

c. Do not issue clearances, such as “extend downwind leg,” if it might cause an aircraft to exceed the circling approach area distance from the runways within which required circling approach obstacle clearances is assured, unless the pilot can maintain terrain clearance visually.

4-8-6 SIDE-STEP MANEUVER

MILITARY

Side-Step Maneuver-When authorized by an instrument approach procedure, you may clear an aircraft for an approach to one runway and inform the aircraft that landing will be made on a parallel runway.

EXAMPLE:

“Cleared I-L-S Runway Three Six Left Approach. Side-step to Runway Three Six Right.”

NOTE—

Side-step maneuvers require higher weather minima/MDA. These higher minima/MDA are published on the instrument approach charts.

REFERENCE—

CLOSED/UNSAFE RUNWAY INFORMATION, Para 3-3-2.

4-8-7 MISSED APPROACH

a. Except in the case of a VFR aircraft practicing an instrument approach, an approach clearance automatically authorizes the aircraft to execute the missed approach procedure depicted for the IAP being flown.

b. If assignment of the alternate missed approach procedure is necessary, the controller shall issue the description as published on the appropriate document.

c. After an aircraft commences a missed approach, it may be vectored at or above the MVA/MIA or follow the provisions of paragraph 5-6-3, Vectors Below Minimum Altitude.

NOTE—

In the event of a missed approach involving a turn, unless otherwise cleared, the pilot will proceed to the missed approach point before starting that turn.

REFERENCE—

PRACTICE INSTRUMENT APPROACHES, 4-8-9.

VECTORS BELOW MINIMUM ALTITUDE, 5-6-3.

SUCCESSIVE OR SIMULTANEOUS DEPARTURES, Para 5-8-3.

4-8-8 APPROACH INFORMATION

Specify the following in the approach clearance when the pilot says he is unfamiliar with the procedure:

a. Initial approach level.

b. Direction and distance from the holding fix within which procedure turn is to be completed.

c. Level at which the procedure turn is to be made.

d. Final approach track and level.

e. Missed approach procedures if considered necessary.

PHRASEOLOGY:

INITIAL APPROACH AT (level), PROCEDURE TURN AT (level) (number) MINUTES/MILES (direction), FINAL APPROACH ON (name of NAVAID) (specified) COURSE/RADIAL/AZIMUTH AT (level).

4-8-9 PRACTICE INSTRUMENT APPROACHES

Authorize, withdraw authorization, delay, or refuse to authorize practice instrument approaches in accordance with the following:

a. When traffic conditions and/or workload prevent the authorization of practice instrument approaches, advise the pilot of the reason, and if applicable, the anticipated delay until the operation can be approved. Controller-imposed delays should not be indefinite. Normally, approaches in progress should not be terminated.

b. Except for military aircraft operating at military airfields, ensure that neither VFR nor IFR practice approaches disrupt the flow of other arriving and departing IFR or VFR aircraft.

NOTE—
The priority afforded other aircraft over practice instrument approaches is not intended to be so rigidly applied that it causes grossly inefficient application of services.

c. IFR aircraft conducting practice instrument approaches shall be afforded IFR separation in accordance with Chapter 3, Chapter 4, Chapter 5, Chapter 6, and Chapter 7 until the aircraft lands and the flight is terminated, or the pilot cancels the flight plan.

d. VFR aircraft conducting practice instrument approaches:

1. Shall be instructed to maintain VFR on initial contact or as soon as possible thereafter.

NOTE—
This advisory is intended to remind the pilot that even though ATC is providing IFR-type instructions, the pilot is responsible for compliance with the Rules of the Air governing VFR flight.

2. Where procedures require the application of IFR separation to VFR aircraft practicing instrument approaches, IFR separation in accordance with Chapter 3, Chapter 4, Chapter 5, Chapter 6, and Chapter 7 shall be provided. Except for super or heavy aircraft, 500 feet vertical separation may be applied between VFR aircraft and between a VFR and an IFR aircraft.

3. Controller responsibility for IFR separation to VFR aircraft begins at the point where the approach clearance becomes effective and ends when the aircraft reaches the missed approach point, unless IFR separation is required for the missed approach procedure as specified in subparagraph e. 2 below.

4. Where separation services are not provided to VFR aircraft practicing instrument approaches, the controller shall:

(a) Instruct the pilot to maintain VFR and advise the pilot that separation services are not provided.

PHRASEOLOGY:

" (Aircraft identification) MAINTAIN VFR, PRACTICE APPROACH APPROVED, NO SEPARATION SERVICES PROVIDED."

(b) Provide traffic information or advise the pilot to contact the appropriate unit.

5. If a level is assigned, including at or above/below levels, the level specified must meet MVA, minimum safe altitude, or minimum IFR level criteria.

REFERENCE—
LEVEL INFORMATION, 4-5-6.
VFR LEVEL ASSIGNMENTS, 7-6-5.

e. Missed Approaches.

1. Unless alternate instructions have been issued, IFR aircraft are automatically authorized to execute the missed approach depicted for the instrument approach being flown.

REFERENCE—

MISSED APPROACH, Para 4-8-7.

2. VFR aircraft are not automatically authorized to execute the missed approach procedure. This authorization must be specifically requested by the pilot and approved by the controller. When a missed approach has been approved and the practice approach is conducted in accordance with subparagraph d. 2 above, IFR separation must be provided throughout the procedure including the missed approach. If the practice approach is conducted in accordance with subparagraph d. 3 above, IFR separation services are not required during the missed approach.

4-8-10 LOW APPROACH AND TOUCH-AND-GO

Consider an aircraft cleared for a touch-and-go, low approach, or practice approach as an arriving aircraft until that aircraft touches down or crosses the landing threshold; thereafter, consider the aircraft as a departing aircraft. Before the aircraft begins its final descent, issue the appropriate departure instructions the pilot is to follow upon completion of the approach (in accordance with paragraph 4-3-2, DEPARTURE CLEARANCES). Climb-out instructions must include a specific heading or a route of flight and level, except when the aircraft will maintain VFR and contact the tower.

NOTE—

Unless the pilot is cleared to maintain terrain clearance visually till reaching the MVA, headings may only be assigned below MVA in a DVA.

REFERENCE—

VECTORS BELOW MINIMUM ALTITUDE, 5-6-3.

EXAMPLE:

“After completing low approach, via “Waipu One” Departure, climb and maintain six thousand.”

“After completing low approach, climb and maintain four thousand, turn right heading two four zero.”

“Maintain VFR, contact tower.” (Issue other instructions as appropriate.)

“After completing low approach, climb and maintain four thousand, turn right heading two four zero, maintain terrain clearance visually till leaving … [level (MVA)]”

NOTE—

Climb-out instructions may be omitted after the first approach if instructions remain the same.

Chapter 5. ATS SURVEILLANCE

Section 1. GENERAL

5-1-1 PRESENTATION AND EQUIPMENT PERFORMANCE

a. Provide ATS surveillance service only if you are personally satisfied that the presentation of surveillance information and equipment performance is adequate for the service being provided.

NOTE—
The provision of ATS surveillance service is not limited to the distance and altitude parameters obtained during the commissioning flight check.

b. Notify the supervisor/controller-in-charge of any radar malfunctions or unexpected outages. Advise adjacent facilities when appropriate.

REFERENCE—

REPORTING ESSENTIAL FLIGHT INFORMATION, Para 2-1-11.

5-1-2 ATS SURVEILLANCE SYSTEMS CAPABILITIES

a. ATS surveillance systems, such as primary surveillance radar (PSR), secondary surveillance radar (SSR), ADS-B and MLAT systems may be used either alone or in combination in the provision of air traffic services, including in the provision of separation between aircraft, provided:

1. Reliable coverage exists in the area;

2. The probability of detection, the accuracy and the integrity of the ATS surveillance system(s) are satisfactory; and

3. In the case of ADS-B, the availability of data from participating aircraft is adequate.

b. PSR systems should be used in circumstances where other ATS surveillance systems alone would not meet the air traffic services requirements.

c. SSR systems, especially those utilizing monopulse techniques or having Mode S capability or MLAT, may be used alone, including in the provision of separation between aircraft, provided:

1. The carriage of SSR transponders is mandatory within the area; and

2. Aircraft identification is established and maintained by use of assigned discrete SSR codes.

NOTE—
The secondary surveillance radar (SSR) alone is not applicable for the military controllers.

d. ADS-B shall only be used for the provision of air traffic control service provided the quality of the information contained in the ADS-B message exceeds the values specified by the appropriate ATS authority.

e. ADS-B may be used alone, including in the provision of separation between aircraft, provided:

1. Identification of ADS-B-equipped aircraft is established and maintained;

2. The data integrity measure in the ADS-B message is adequate to support the separation minimum; and

3. There is no requirement for detection of aircraft not transmitting ADS-B.

f. The use of radar in air traffic services shall be limited to specified areas of radar coverage and shall be subject to such other limitations as have been specified by the appropriate ATS authority. Adequate information on the operating methods used shall be published in aeronautical information publications, as

well as operating practices and/or equipment limitations having direct effects on the operation of the air traffic services.

g. Where PSR and SSR are required to be used in combination, SSR alone may be used in the event of PSR failure to provide separation between identified transponder equipped aircraft, provided the accuracy of the SSR position indications has been verified by monitor equipment or other means.

5-1-3 MERGING TARGET PROCEDURES

a. Except while they are established in a holding pattern, or they are on assigned level, apply merging target procedures to all identified:

1. Aircraft at 10,000 feet and above.
2. Turbojet aircraft regardless of level.
3. Presidential aircraft regardless of level.

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

EXAMPLE:

"Traffic twelve o'clock, seven miles, eastbound, Gulf-stream 650, Flight Level One Seven Zero."

"United one six and American two five, traffic twelve o'clock, one zero miles, opposite direction, eastbound Boeing seven thirty seven, Flight Level Three Three Zero, westbound Airbus three twenty, Flight Level Three Two Zero."

c. When both aircraft in subpara b. are in RVSM airspace, and vertically separated by 1,000 feet, and either pilot reports they are unable to maintain RVSM due to turbulence or mountain wave, use vectors to prevent the targets from merging.

EXAMPLE:

"EVA three one, fly heading two niner zero, vector for traffic. Traffic twelve o'clock, one zero miles, opposite direction, eastbound Boeing seven thirty seven at flight level three one zero."

d. If the pilot requests, vector their aircraft to avoid merging targets with the previously issued traffic.

NOTE—
Because aircraft closure rates can be rapid, issue traffic with enough time for the pilot to decide if a vector is necessary.

PHRASEOLOGY:

TURN LEFT (or RIGHT) IMMEDIATELY HEADING (three digits) TO AVOID 〔UNIDENTIFIED〕 TRAFFIC (bearing by clock-reference and distance);

TURN LEFT (or RIGHT) (number of degrees) DEGREE IMMEDIATELY TO AVOID 〔UNIDENTIFIED〕 TRAFFIC AT (bearing by clock-reference and distance).

e. If unable to provide vector service, inform the pilot.

NOTE—
The phraseology "Unable RVSM due to turbulence (or mountain wave)" is only intended for severe turbulence or other weather encounters with altitude deviations of approximately 200 feet or more.

5-1-4 HOLDING PATTERN SURVEILLANCE

Provide ATS surveillance of outer fix holding pattern airspace areas, or any portions thereof, shown on your ASD (displayed on the system map) 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.

5-1-5 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, help the aircraft to return to the assigned protected airspace.

REFERENCE—

ROUTE OR LEVEL AMENDMENTS, Para 4-2-4.

5-1-6 POSITION REPORTING

a. 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” or “identified” from ATC, it discontinues reporting over compulsory reporting points. It resumes normal position reporting when ATC inform it “radar contact lost”, “identification lost”, “radar service terminated” or “identification terminated”.

b. 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 NAVAID) (specified) RADIAL.

5-1-7 TERMINATION OF ATS SURVEILLANCE SERVICE

a. Inform aircraft when ATS surveillance service is terminated.

PHRASEOLOGY:

RADAR SERVICE (or IDENTIFICATION) TERMINATED [DUE (reason)] (instructions).

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

NOTE—
Termination of radar monitoring where PAR equipment is used to monitor approaches is prescribed in para 5-13-3 MONITOR INFORMATION.

1. An aircraft cancels its IFR flight plan, except within Class C airspace, or where basic radar service is provided.
2. An aircraft conducting an instrument or visual approach has landed.
3. At tower-controlled aerodromes where radar coverage does not exist to within 1/2 mile of the end of the runway, arriving aircraft shall be informed when radar service is terminated.
4. ***TERMINAL***: An arriving VFR aircraft receiving radar service to a tower-controlled aerodrome within Class C airspace or where basic radar service is provided has landed or to all other aerodromes is instructed to change to tower frequency.
5. ***TERMINAL***: An aircraft completes a radar approach.

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Section 2. BEACON SYSTEMS

5-2-1 ASSIGNMENT CRITERIA

a. General:

1. Mode 3/A is designated as the common military/civil mode for air traffic control use.
2. Make radar beacon code assignments to only Mode 3/A transponder-equipped aircraft.

b. Unless otherwise specified in this section, a facility directive or a LOA, issue beacon codes assigned by the computer. Computer-assigned codes may be modified as required.

PHRASEOLOGY:

SQUAWK THREE/ALFA (code).

or

SQUAWK (code).

REFERENCE—

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-2 SSR CODE CHANGES

a. Unless otherwise specified in a directive or a LOA 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.

REFERENCE—

IFR-VFR AND VFR-IFR FLIGHTS, Para 4-2-5.

BEACON IDENTIFICATION METHODS, Para 5-3-3.

b. To reduce the workload for pilots and controllers, keep the number of code changes to a minimum.

5-2-3 EMERGENCY CODE ASSIGNMENT

Assign codes to emergency aircraft as follows:

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

PHRASEOLOGY:

SQUAWK MAYDAY ON 7700.

b. 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 SSR 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 units that the aircraft in distress is identified and under ATC control.

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 ABLE, SQUAWK (code).

REFERENCE—

BEACON IDENTIFICATION METHODS, Para 5-3-3.

c. The following shall be accomplished on a Mode C equipped VFR aircraft which is in emergency but no longer requires the assignment of **code 7700**, assign a SSR code that will permit Safety Nets and Monitoring Aids Processing (SNMAP)/Minimum Safe Altitude Warning (MSAW) alarm processing.

5-2-4 RADIO FAILURE

When you observe “RF” or a code 7600 display, apply the procedures in Chapter 9, Section 4, COMMUNICATIONS FAILURE.

NOTE—

Should a transponder-equipped aircraft experience a loss of two-way radio communications capability, the pilot can be expected to adjust his transponder to ***code 7600****.*

REFERENCE—

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-5 HIJACK/UNLAWFUL INTERFERENCE

When you observe “HJ” or a code 7500 display, apply the procedures in paragraph 9−2−6, Hijacked Aircraft.

5-2-6 VFR CODE ASSIGNMENTS

a. For VFR aircraft receiving radar advisories, issue a computer-assigned beacon code.

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 information.

NOTE—

Safety alerts/traffic information 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.

b. Instruct an IFR aircraft that cancels its IFR flight plan and is not requesting radar advisory service, or a VFR aircraft for which radar advisory service is being terminated to squawk the VFR code.

PHRASEOLOGY:

SQUAWK 06XX.

c. When an aircraft changes from VFR to IFR, assign a beacon code to Mode C equipped aircraft that will allow SNMAP alarms.

REFERENCE—

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-7 STANDBY OPERATION

You may instruct an aircraft operating on an assigned code to change transponder to “standby”:

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

b. 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” position as soon as possible thereafter.

PHRASEOLOGY:

SQUAWK STANDBY,

or

SQUAWK NORMAL.

REFERENCE—

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-8 CODE MONITOR

Continuously monitor the codes assigned to aircraft operating within your area of responsibility.

5-2-9 FAILURE TO DISPLAY ASSIGNED BEACON CODE OR INOPERATIVE/ MALFUNCTIONING TRANSPONDER

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

PHRASEOLOGY:

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

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

PHRASEOLOGY:

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

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

REFERENCE—

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-10 INOPERATIVE OR MALFUNCTIONING INTERROGATOR

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

PHRASEOLOGY:

SECONDARY RADAR OUT OF SERVICE

REFERENCE—

ATS SURVEILLANCE SYSTEMS CAPABILITIES, Para 5-1-2.

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-11 FAILED TRANSPONDER

For aircraft without a serviceable transponder, consider the following prior to issuing a clearance:

a. Traffic conditions enroute and at the destination.

b. Current and forecast weather enroute and at the destination aerodrome, including the possibility of a diversion.

c. Non-radar control procedures that may have to be applied.

d. The need for the aircraft to proceed to an aerodrome to effect a repair.

e. Unit Directives.

f. For transponder failure when airborne within radar coverage:

1. Subject to safety considerations, processing the aircraft concerned to the first point of intended landing.

2. The necessity for a decision prior to losing primary radar surveillance, and the need to hold the aircraft within radar coverage pending such decision.

REFERENCE—

ATS SURVEILLANCE SYSTEMS CAPABILITIES, Para 5-1-3.

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-12 VALIDATION OF MODE C READOUT

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

a. Consider a level readout valid when:

1. It varies less than 300 feet from the pilot reported level, or

PHRASEOLOGY:

CONFIRM LEVEL (level)

2. 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 level filter limits are set to include the field elevation.

REFERENCE—
LEVEL FILTERS, Para 5-2-17.

SELECTED LEVEL LIMITS, Para 5-13-5.

3. You have correlated the level 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.

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

c. Whenever you observe an aircraft below FL 130 with an invalid Mode C readout:

1. Issue the correct altimeter setting and confirm the pilot has accurately reported the level.

PHRASEOLOGY:

(Location) QNH (appropriate altimeter), CHECK ALTIMETER SETTING AND CONFIRM (level)

2. If the level readout continues to be invalid:

(a) Instruct the pilot to turn off the level-reporting part of his/her transponder and include the reason; and,

(b) Notify the operational supervisor-in-charge of the aircraft call sign.

(c) Ensure that the subsequent control position in the unit or the next unit, as applicable, is notified when the level readout is malfunctioning/inoperative.

PHRASEOLOGY:

STOP SQUAWK CHARLIE WRONG INDICATION

d. Whenever you observe an aircraft at or above FL130 with an invalid Mode C readout, unless the aircraft is descending below transition level:

1. Confirm that the pilot is using 1013 hectopascals as the altimeter setting and has accurately reported the level.

PHRASEOLOGY:

CONFIRM USING ONE ZERO ONE THREE AS YOUR ALTIMETER SETTING, CONFIRM (level)

2. If the Mode C readout continues to be invalid:

   (a) Instruct the pilot to turn off the level-reporting part of his/her transponder and include the reason, and

   (b) Notify the operational supervisor-in-charge of the aircraft call sign.

   (c) Ensure that the subsequent control position in the unit or the next unit, as applicable, is notified when the level readout is malfunctioning/inoperative.

   PHRASEOLOGY:

   STOP SQUAWK CHARLIE WRONG INDICATION

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

5-2-13 LEVEL CONFIRMATION - MODE C

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

NOTE—

For the purpose of this paragraph, "initial contact" means a pilot's first radio contact with each sector/position.

a. The pilot states the assigned level, or

b. You assign a new level to a climbing or a descending aircraft, or

c. The Mode C readout is valid and indicates that the aircraft is established at the assigned level, or

d. ***TERMINAL:*** The aircraft was transferred to you from another sector/position within your unit (intraunit).

   PHRASEOLOGY:

   In level flight situations, CONFIRM (level)

   In climbing/descending situations, CONFIRM ASSIGNED (level)

   EXAMPLE:

   "N888LK, Confirm six thousand".

   REFERENCE—

   BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-14 LEVEL CONFIRMATION - NON-MODE C

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

NOTE—

For the purpose of this paragraph, "initial contact" means a pilot's first radio contact with each sector/position.

a. The pilot states the assigned level, or

b. You assign a new level to a climbing or a descending aircraft, or

c. ***TERMINAL***: The aircraft was transferred to you from another sector/position within your unit (intraunit).

   PHRASEOLOGY:

   In level flight situations, CONFIRM (level)

   In climbing/descending situations, CONFIRM ASSIGNED (level)

   EXAMPLE:

   "Charlie six seven seven, confirm assigned flight level two four zero".

REFERENCE—

BEACON IDENTIFICATION METHODS, Para 5-3-3.

5-2-15 AUTOMATIC LEVEL REPORTING

Inform an aircraft when you want it to turn on/off the automatic level reporting feature of its transponder.

PHRASEOLOGY:

SQUAWK CHARLIE

or

STOP SQUAWK CHARLIE

NOTE—

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

REFERENCE—

VALIDATION OF MODE C READOUT, Para 5-2-12.

BEACON IDENTIFICATION METHODS, PARA 5-3-3.

5-2-16 TO REQUEST TERMINATION OF TRANSPONDER AND/OR ADS-B TRANSMITTER OPERATION

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

PHRASEOLOGY:

STOP SQUAWK [TRANSMIT ADS-B ONLY]

STOP ADS-B TRANSMISSION [SQUAWK (CODE) ONLY]

NOTE—

① Independent operations of Mode S transponder and ADS-B may not be possible in all aircraft. In such cases, aircraft may not be able to comply with ATC instructions related to ADS-B operation.

② For a military aircraft when you do not know if the military service requires that it continue operating on another mode.

REFERENCE—

SSR IDENTIFICATION METHODS, Para 5-3-3.

5-2-17 LEVEL FILTERS

TERMINAL

Set level filters to display Mode C level readouts to encompass all levels with the controller's jurisdiction. Set the upper limits no lower than 1,200 feet above the highest level for which the controller is responsible. In those stratified position, set the lower limit to 1,200 feet or more below the lowest level 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 level filter limit to encompass the field elevation so that provision of para 2-1-8, SAFETY ALERT, and para 5-2-15, VALIDATION OF MODE C READOUT, subpara a.2. may be applied. Air traffic managers may authorize temporary suspension of this requirement when target clutter is excessive.

5-2-18 OPERATION OF ADS-B TRANSMITTERS

NOTE—

① To indicate that it is in a state of emergency or to transmit other urgent information, an aircraft equipped with ADS-B might operate the emergency and/or urgency mode as follows:

a. emergency;

b. communication failure;

c. unlawful interference;

d. minimum fuel; and/or

e. medical.

② Some aircraft equipped with first generation ADS-B avionics do not have the capability described in Note ① above and only have the capability to transmit a general emergency alert regardless of the code selected by the pilot.

a. Aircraft equipped with ADS-B having an aircraft identification feature shall transmit the aircraft identification as specified in the corresponding item of the filed flight plan, such as Item 7 of the FPL or, when no flight plan has been filed, the aircraft registration.

b. Whenever it is observed on the situation display that the aircraft identification transmitted by an ADS-B-equipped aircraft is different from that expected from the aircraft, the pilot shall be requested to confirm and, if necessary, re-enter the correct aircraft identification.

c. If, following confirmation by the pilot that the correct aircraft identification has been set on the ADS-B identification feature, the discrepancy continues to exist, the following actions shall be taken by the controller:

   1. inform the pilot of the persistent discrepancy;

   2. where possible, correct the label showing the aircraft identification on the situation display; and

   3. notify the next control position and any other unit concerned of the erroneous aircraft identification transmitted by the aircraft.

5-2-19 INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER

TERMINAL

Inform an aircraft when controller observe the ADS-B transmitter appears to be inoperative or malfunctioning.

PHRASEOLOGY:

(Aircraft ID) YOUR ADS-B TRANSMITTER APPEARS TO BE INOPERATIVE / MALFUCTIONING.

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Section 3. IDENTIFICATION

5-3-1 APPLICATION

Before you provide ATS surveillance service, establish and maintain ATS surveillance identification of the aircraft involved, except as provided in para 5-5-1, APPLICATION, subparas b. and c.

REFERENCE—
USE OF TOWER_AIR SITUATION DISPLAYS, Para 3-1-9.

5-3-2 PRIMARY RADAR IDENTIFICATION METHODS

Identify a primary, radar beacon, or ADS-B target by using one of the following methods:

a. Observing a departing aircraft target within 1 mile of the takeoff runway end at aerodrome with an operating control tower.

NOTE—
Particular care should be taken to avoid confusion with aircraft holding over or overflying the aerodrome, or with aircraft departing from or making a missed approach over adjacent runways.

b. Observing a target whose position with respect to a fix (displayed on the system map, scribed on the map overlay) 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 system map or map overlay.

NOTE—

① *Establishment of radar identification through use of DME position information can be complicated by the fact that some military TACANs are not collocated with frequency-paired VORs and might be separate from them by as much as 31 miles.*

② *Visual reporting points used for RADAR identification are limited to those most used by pilots and whose range and azimuth have been determined by supervisory personnel.*

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

PHRASEOLOGY

FOR IDENTIFICATION TURN LEFT (or RIGHT) HEADING (three digits)

NOTE—
Use of identifying turns or headings which would cause the aircraft to follow normal IFR routes or known VFR flight paths might result in misidentification. When these circumstances cannot be avoided, additional methods of identification may be necessary.

1. 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.
2. Only one aircraft is observed making these turns.
3. 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 level in your area of jurisdiction before you issue a heading.

d. By transfer of radar identification.

REFERENCE—
USE OF TOWER AIR SITUATION DISPLAYS, Para 3-1-9.

SURVEILLANCE UNUSABLE, Para 5-12-10.

5-3-3 BEACON IDENTIFICATION METHODS

a. Where SSR is used, aircraft may be identified by one or more of the following procedures:

1. Recognition of the aircraft identification in a radar label.

NOTE—

The use of this procedure requires that the code/track label coupling is achieved successfully, taking into account the Note following 2) below.

2. Recognition of an assigned discrete code, the setting of which has been verified, in a radar label.

NOTE—

The use of this procedure requires a system of code assignment which ensures that each aircraft in a given portion of airspace is assigned a discrete code.

3. Direct recognition of the aircraft identification of a Mode S-equipped aircraft in a radar label.

NOTE—

The aircraft identification feature available in Mode S transponders provides the means to identify directly individual aircraft on air situation displays and thus offers the potential to eliminate ultimately the recourse to Mode A discrete codes for individual identification. This elimination will only be achieved in a progressive manner depending on the state of deployment of suitable ground and airborne installations.

4. By transfer of radar identification.

5. Observation of compliance with an instruction to set a specific code.

6. Observation of compliance with an instruction to squawk IDENT.

PHRASEOLOGY

SQUAWK [(code)] [and] IDENT

NOTE—

① In automated systems, the "IDENT" feature may be presented in different ways, e.g. as a blinking color change of the track symbol.

②Garbling of transponder replies may produce "IDENT" - type of indications. Nearly simultaneous "IDENT" transmissions within the same area may give rise to errors in identification.

b. When a discrete code has been assigned to an aircraft, a check shall be made at the earliest opportunity to ensure that the code set by the pilot is identical to that assigned for the flight. Only after this check has been made shall the discrete code be used as a basis for identification.

5-3-4 ADS-B IDENTIFICATION PROCEDURES

Where ADS-B is used for identification, aircraft may be identified by one or more of the following procedures:

a. Direct recognition of the aircraft identification in an ADS-B label;

b. Transfer of ADS-B identification; and

c. Observation of compliance with an instruction to TRANSMIT ADS-B IDENT.

PHRASEOLOGY:

TRANSMIT ADS-B IDENT.

NOTE—

① Some aircraft equipped with first generation ADS-B avionics do not have the capability of squawking IDENT while the emergency and/or urgency mode is selected.

② In automated systems, the "IDENT" feature may be presented in different ways, e.g. as a blinking color change

of the track symbol.

PHRASEOLOGY:

IDENTIFIED [position].

NOT IDENTIFIED [reason], [RESUME (or CONTINUE) OWN NAVIGATION].

IDENTIFICATION LOST [reasons] (instructions).

IDENTIFICATION TERMINATED [DUE (reason)] (instructions).

5-3-5 ATMS IDENTIFICATION METHODS

a. Consider an auto-acquired aircraft as identified when the track label is displayed and is visible to you, and one of the following conditions exist:

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

2. The aircraft is being handed off through use of ATMS automated or manual handoff and the track symbol does not appear in “ ”, “ ” or “ ” format (coast status).

b. Use the ATMS surveillance tagged label data to maintain direct recognition of target identity unless it is in a coast status.

REFERENCE—

USE OF TOWER AIR SITUATION DISPLAYS, Para 3-1-9.

5-3-6 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 reidentify the aircraft or terminate ATS surveillance service. As described in para 5-3-2, Primary Radar Identification Methods, or para 5-3-3, SSR Identification Methods or para 5-3-4 ADS-B Identification Methods.

REFERENCE—

METHODS, Para 5-4-3.

5-3-7 POSITION INFORMATION

a. An aircraft provided with ATS surveillance service should be informed of its position in the following circumstances:

1. Upon identification, except when the identification is established:

(a) Based on the pilot’s report of the aircraft position or within 1 mile of the runway upon departure and the observation is consistent with the aircraft’s time of departure, or

(b) By use of ADS-B aircraft identification, Mode S aircraft identification or assigned discrete SSR codes or Mode S and the location of the observed position indication is consistent with the current flight plan of the aircraft, or

(c) By transfer of identification.

2. When the pilot requests this information.

3. When a pilot’s estimate differs significantly from the controller’s estimate based on the observed position.

4. Unless describe in 5-6-2 e.3., when the pilot is instructed to resume own navigation after vectoring

if the current instructions had diverted the aircraft from a previously assigned route.

5. Immediately before termination of ATS surveillance service, if the aircraft is observed to deviate from its intended route.

b. Position information shall be passed to aircraft in one of the following forms:

1. As a well-known geographical position
2. Magnetic track and distance to a significant point, an en-route navigation aid, or an approach aid
3. Direction (using points of the compass) and distance from a known position
4. Distance to touchdown, if the aircraft is on final approach, or
5. Distance and direction from the centre line of an ATS route.

PHRASEOLOGY:

POSITION (distance) (direction) OF (significant point)

or OVER or ABEAM (significant point)

c. Whenever practicable, position information shall relate to positions or routes pertinent to the navigation of the aircraft concerned and displayed on the system map.

d. When so informed, the pilot may omit position reports at compulsory reporting points or report only over those reporting points specified by the air traffic services unit concerned, including points at which air-reports are required for meteorological purposes. Pilots shall resume position reporting when so instructed and when advised that radar service is terminated or that radar identification is lost.

5-3-8 IDENTIFICATION STATUS

a. Inform an aircraft of radar contact or identified when:

1. Initial identification in the ATC system is established.
2. Subsequent to loss of radar contact or identification, or termination of ATS surveillance service, ATS surveillance identification is reestablished.

PHRASEOLOGY:

RADAR CONTACT (position if required);

IDENTIFIED [position].

b. Inform an aircraft when radar contact or identification is lost.

PHRASEOLOGY:

RADAR CONTACT LOST (alternative instructions when required);

IDENTIFICATION LOST [reasons] (instructions).

5-3-9 TARGET MARKERS

a. Retain track labels that are coupled with the appropriate target symbol in order to maintain continuous identity of aircraft. Retain the track label 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 track labels shall display flight identification and level information, as a minimum.

NOTE—

Where delegated airspace extends beyond Class C airspace, the following will apply: If a VFR aircraft is clear of Class C airspace and ATS surveillance service have been terminated then retention of the track label is no longer required.

b. During prearranged coordination procedures, the controllers who penetrate another controller’s airspace

shall display track label information of that controller’s aircraft which shall contain, at a minimum, the position symbol and level information.

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Section 4. TRANSFER OF IDENTIFICATION

5-4-1 APPLICATION

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

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

b. Coordinated by the transferring and accepting controllers for a specified period of time.

REFERENCE—
COORDINATION WITH ACCEPTING UNIT, Para 4-3-6.

5-4-2 TERMS

a. *Handoff* – An action taken to transfer the identification of an aircraft from one controller to another controller if the aircraft will enter the accepting 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 accepting controller's airspace.

c. *Identification* – The situation which exists when the position indication of a particular aircraft is seen on a situation display and positively identified.

d. *Point Out* – An 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.

e. *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 accepting controller's airspace, as coordinated, without a communications transfer.

f. *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:

   1. In response to a handoff or point out;

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

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

g. *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.

5-4-3 METHODS

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

   1. Physically point to the target on the accepting controller's display.

   2. Use landline voice communications.

   3. Use automation capabilities.

   4. Notification of the aircraft's discrete SSR code or aircraft address;

      NOTE—

① The use of a discrete SSR code requires a system of code assignment which ensures that each aircraft in a given portion of airspace is assigned a discrete code

② Aircraft address would be expressed in the form of the alphanumerical code of six hexadecimal characters.

③ THIS PROCEDURE SHALL BE APPLIED IN ACCORDANCE WITH A LOA.

5. ATMS has interunit handoff capabilities that can be manually initiated and accepted through the keyboard command, or used in automatic handoff mode as in ATMS.

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

1. The position of the target relative to a fix, map symbol, or radar track known and displayed by both the accepting and transferring controllers. Mileage from the reference point may be omitted when relaying the position of a target if a track label coupled with the target has been forced on the accepting controller's ASD.

EXAMPLE:

"Point out, Southwest of HLG VORTAC"

2. The aircraft identification, as follows;

(a) The aircraft call sign, or

(b) The discrete beacon code of the aircraft during interunit point-outs only, if both the accepting and the transferring controllers agree.

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

3. The assigned level, appropriate restrictions, and information that the aircraft is climbing or descending, if applicable, except when inter/intraunit directives ensure that the level information will be known by the accepting controller.

NOTE—
When physically pointing to the target, you do not have to state the aircraft position.

PHRASEOLOGY:

HANDOFF/POINT-OUT/TRAFFIC (aircraft position) (aircraft ID)

or

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

4. Advise the receiving controller of pertinent information not contained in the data block or available flight data unless covered in an LOA or facility directive. Pertinent information may include:

(a) Assigned heading.

(b) Speed/altitude restrictions.

(c) Observed track or deviation from the last route clearance.

(d) Any other pertinent information.

PHRASEOLOGY—

HANDOFF/POINT-OUT/TRAFFIC (aircraft position) (aircraft ID)

Or

(discrete beacon code point-out only) (level, 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,

or

IDENTIFIED,

or

(Aircraft ID or discrete beacon code) (restrictions, if applicable) POINT-OUT APPROVED,

or

TRAFFIC OBSERVED,

or

UNABLE (appropriate information, as required),

or

NOT IDENTIFIED,

d. If any doubt as to target identification exists after attempting confirmation in accordance with this section, apply the provisions of para 5-3-6, QUESTIONABLE IDENTIFICATION.

REFERENCE—

VALIDATION OF MODE C READOUT, Para 5-2-12.

5-4-4 TRAFFIC

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

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

5-4-5 TRANSFERRING CONTROLLER HANDOFF

Unless otherwise coordinated or specified in an LOA or facility directive, the transferring controller must:

a. Complete ATS surveillance handoff prior to an aircraft entering the airspace delegated to the accepting controller.

b. Verbally obtain the accepting controller's approval prior to making any changes to an aircraft's flight path, altitude, speed, or data block information while the handoff is being initiated or after acceptance.

c. Advise the accepting controller of pertinent information not contained in the track label or EFS, including:

1. Assigned heading.
2. Air speed restrictions.
3. Level information issued.
4. Observed track or deviation from the last route clearance.
5. The beacon code, if different from that normally used or previously coordinated.
6. Any other pertinent information.

d. Initiate verbal coordination to verify the position of primary or nondiscrete targets except for intraunit automated handoffs.

e. Initiate verbal coordination before transferring control of a track if "++++", "????", "(space)" appears in the track label or when the CRL field displays "INV", or is blank.

f. Advise the accepting controller that ATS surveillance monitoring is required when the aircraft is on a direct route initiated by ATC that exceeds usable NAVAID distances.

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

h. Prior to transferring communications:

1. Resolve any potential violations of adjacent airspace and potential conflicts with other aircraft in your area of jurisdiction.

2. Coordinate with any controller whose area of jurisdiction the aircraft will transit prior to entering the accepting controller's area of jurisdiction, except when such coordination is the accepting controller's responsibility as stated in para 5-4-6, ACCEPTING CONTROLLER HANDOFF.

3. Forward to the accepting controller any restrictions issued to ensure separation.

4. Comply with restrictions issued by the accepting controller.

i. Comply with the provisions of para 2-1-18, RADIO COMMUNICATIONS TRANSFER to the extent possible, transfer communications when the handoff has been accepted.

j. After transferring communications, continue to comply with the requirements of subparas h.1. and h.2.

k. Before releasing control of the aircraft, issue restrictions to the accepting controller which are necessary to maintain separation from other aircraft within your area of jurisdiction.

REFERENCE—
COORDINATE USE OF AIRSPACE, Para 2-1-15.
CONTROL TRANSFER, Para 2-1-16.
ACCEPTING CONTROLLER HANDOFF, Para 5-4-6.

5-4-6 ACCEPTING CONTROLLER HANDOFF

The accepting controller must:

a. Ensure that the target position corresponds with the position given by the transferring controller or that there is an appropriate coupling between an automated track label and the target being transferred before accepting a handoff.

REFERENCE—
COORDINATE USE OF AIRSPACE, Para 2-1-15
CONTROL TRANSFER, Para 2-1-16.
TRANSFERRING CONTROLLER HANDOFF, Para 5-4-5.

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

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

d. 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:

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

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

e. 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 and GCAs which have been delegated the responsibility for providing 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.

REFERENCE—
APPROACH SEPARATION RESPONSIBILITY, Para 5-9-5.

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

1. The track label coupled with the target being handed off indicates the computer assigned discrete beacon code is being received, or

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

g. Initiate verbal coordination prior to accepting control of a track if "++++", "????", "(space)" appears in the track label or when the CRL field displays "INV", or is blank, advise the other unit that a disparity exists between the position or CRL declared by their computer and that declared by your ATMS system.

h. Advise the transferring controller, that as soon as possible if 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.

5-4-7 POINT OUT

a. The transferring controller shall:

1. Obtain verbal approval before permitting an aircraft to enter the receiving controller's delegated airspace.

2. 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.

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

4. 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.

b. The receiving controller shall:

1. Ensure that the target position corresponds with the position given by the transferring controller or that there is coupling between a track label and the target being transferred prior to approving a point out.

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

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

5-4-8 AUTOMATED INFORMATION TRANSFER (AIT)

Transfer ATS surveillance identification and/or altitude control without verbal coordination under the following conditions:

a. During ATS surveillance handoff; and

b. Via information displayed in coupled track labels; and

c. Within the same unit, except as provided in para 5-4-9, Interunit Automated Information Transfer; and

d. When following procedures specified in your unit AIT directive.

5-4-9 INTERUNIT AUTOMATED INFORMATION TRANSFER

EN ROUTE

Transfer ATS surveillance identification without verbal coordination under the following conditions:

a. During ATS surveillance handoff; and

b. Via information displayed in coupled track labels; and

c. On aircraft at assigned altitude in level flight; and

d. Only the first sector within the accepting unit shall utilize the procedure; and

e. When following procedures specified in your unit AIT directive and LOA.

5-4-10 PREARRANGED COORDINATION

Prearranged coordination allowing aircraft under your control to enter another controller's area of jurisdiction may only be approved provided procedures are established and published in a unit directive/LOA.

NOTE—

Under no circumstances may one controller permit an aircraft to enter another's airspace without proper coordination. Coordination can be accomplished by several means; i.e. ATS surveillance handoff, automated information transfer, verbal, point-out, and by prearranged coordination procedures identified in a unit directive that clearly describe the correct application. Airspace boundaries should not be permitted to become barriers to the efficient movement of traffic. In addition, complete coordination, awareness of traffic flow, and understanding of each position's responsibility concerning penetration of another's airspace cannot be overemphasized.

REFERENCE—

COORDINATE USE OF AIRSPACE, Para 2-1-15.

METHODS, Para 5-4-3.

AUTOMATED INFORMATION TRANSFER(AIT), Para 5-4-8.

Section 5. ATS SURVEILLANCE SEPARATION

5-5-1 APPLICATION

ATS surveillance separation may be applied between:

a. Identified aircraft.

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

c. An identified aircraft and one not identified when either is cleared to climb/descend through the level of the other provided:

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

2. Flight data on the aircraft not identified indicate it is a type which can be expected to give adequate ATS surveillance target in the area where separation is applied; and

3. When ATMS is operated, the airspace within which ATS surveillance separation is applied is not less than10 miles from the edge of the display, and

NOTE—

The range of the display may be adjusted by zooming in/out to meet operational needs. After the range scale is adjusted, the requirement of 10 miles from the edge of the display is to be applied.

4. ATS surveillance separation is maintained between the identified aircraft and all observed ATS surveillance targets until nonradar separation is established from the aircraft not identified; and

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

REFERENCE—

EXCEPTIONS, Para 4-1-2.

ROUTE USE, Para 4-4-1.

APPLICATION, Para 5-3-1.

ADDITIONAL SEPARATION FOR FORMATION FLIGHTS, Para 5-5-8.

APPROACH SEPARATION RESPONSIBILITY, Para 5-9-5.

5-5-2 TARGET SEPARATION

Apply ATS surveillance separation between the centers of the targets symbols. Do not allow target symbols to touch unless vertical separation is applied between the aircraft concerned.

5-5-3 RESERVED

5-5-4 MINIMA

Unless otherwise prescribed by the ATS authority, the horizontal separation based on radar and /or ADS-B shall be 5 NM.

a. MILITARY:

When using Single Radar Mode, separate aircraft by the following minima:

1. When less than 40 miles from the antenna – 3 miles.

2. When 40 miles or more from the antenna – 5 miles.

b. TERMINAL: The application of 3 mile separation will be applied by ATS unit and individually approved by the CAA.

c. When transitioning from prescribed area to en route control area, 3 miles increasing to 5 miles or greater, provided:

1. Aircraft are on diverging routes/tracks, and/or,

2. The leading aircraft is and will remain faster than the following aircraft; and

3. Separation constantly increasing and the first center controller will establish 5 NM or other appropriate form of separation prior to the aircraft departing the first center sector; and

4. The procedure is covered by a letter of agreement between the units involved and limited to specified routes and/or sectors/positions.

WAKE TURBULENCE APPLICATION

d. The minima set out in para 5-5-4 e. shall be applied when:

1. An aircraft is operating directly behind another aircraft at the same altitude or less than 1,000 ft below (See FIG 5-5-1); or

2. Both aircraft are using the same runway or parallel runways separated by less than 760 m /2,500 ft; or

3. An aircraft is crossing behind another aircraft at the same altitude or less than 1,000 ft below (See FIG 5-5-1).

e. When using wake turbulence categories contained in para 2-1-20 a., the following distance-based wake turbulence separation minima shall be applied to aircraft being provided with an ATS surveillance service in the approach and departure phases of flight in the circumstances given in 5-5-4 d.:

Aircraft category		
Preceding aircraft	*Succeeding aircraft*	*Distance-based wake turbulence separation minima*
SUPER	HEAVY	5NM
	MEDIUM	7NM
	LIGHT	8NM
HEAVY	HEAVY	4NM
	MEDIUM	5NM
	LIGHT	6NM
MEDIUM	LIGHT	5NM

REFERENCE—

WAKE TURBULENCE, Para 2-1-20.

SAME RUNWAY SEPARATION, Para 3-9-7.

ROUTE USE, Para 4-4-1.

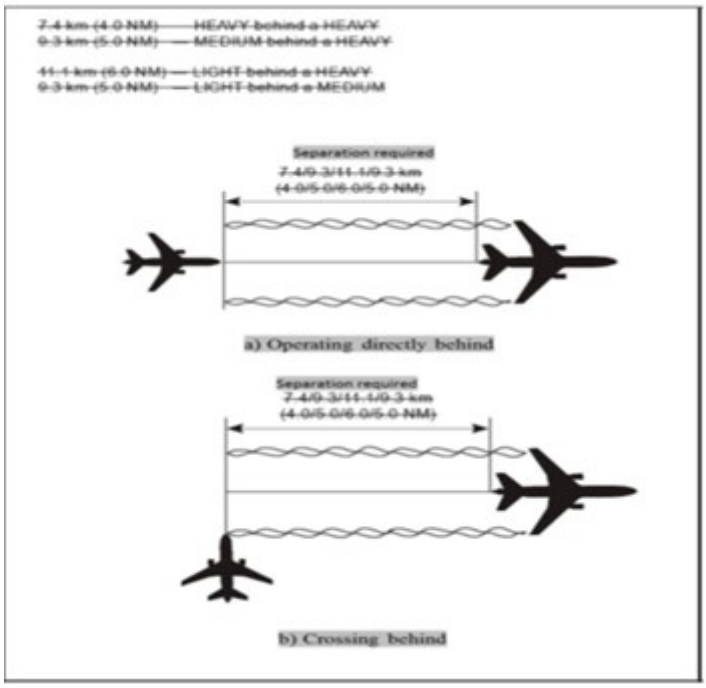
PASSING OR DIVERGING, Para 5-5-7.

SUCCESSIVE OR SIMULTANEOUS DEPARTURES, Para 5-8-3.

APPROACH SEPARATION RESPONSIBILITY, Para 5-9-5.

f. Provide a minimum of 8 miles in-trail spacing behind a SUPER when transitioning from enroute to terminal airspace. This interval must exist when the leading aircraft crosses the terminal/en route boundary or transfer of control point.

FIG 5-5-1 Operating directly behind or crossing behind



5-5-5 VERTICAL APPLICATION

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

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

REFERENCE—

VERTICAL SEPARATION MINIMA, Para 4-5-1.

VALIDATION OF MODE C READOUT, Para 5-2-12.

b. With consideration of known aircraft performance characteristics, assign a level to an aircraft after the aircraft previously at that level has been issued a climb/descent clearance and is observed (valid Mode C), or reports leaving the level.

NOTE—

1. Consider known aircraft performance characteristics, pilot furnished and/or Mode C detected information which indicate that climb/descent will not be consistent with the rates recommended in the (operator's manual).

2. It is possible that the separation minima described in para 4-5-1, VERTICAL SEPARATION MINIMA, might not always be maintained using subpara b. However, correct application of this procedure will ensure that aircraft are safely separated because the first aircraft must have already vacated the level prior to the assignment of that level to the second aircraft.

REFERENCE—

PROCEDURAL PREFERENCE, Para 2-1-4.

VERTICAL SEPARATION MINIMA, Para 4-5-1.

VALIDATION OF MODE C READOUT, Para 5-2-12.

APPLICATION, Para 6-6-1.

5-5-6 EXCEPTIONS

a. Do not use Mode C to effect vertical separation with an aircraft on a cruise climb, or block level clearance, or as specified in para 5-13-4, SYSTEM REQUIREMENTS, subpara d.

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

1. Severe turbulence is reported.
2. Aircraft are conducting military aerial refueling.
3. The aircraft previously at that level has been issued a clearance to climb/descent when ready.

c. When the position symbol associated with the full data block falls more than one history behind the actual aircraft target or there is no target symbol displayed, the Mode C information in the full data block shall not be used for the purpose of determining separation.

5-5-7 PASSING OR DIVERGING

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

1. Aircraft concerned are in the airspace applicable to 3 mile separation.
2. Aircraft are on opposite/reciprocal tracks and you observed that they have passed each other; or aircraft are on same or crossing tracks / assigned radar vectors and one aircraft has crossed the projected track of the other and the angular difference between their tracks / assigned radar vectors at least 15 degrees.

NOTE—

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

3. The tracks are monitored to ensure that the track symbols of ATMS surveillance targets 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 para 5−5−4, Minima, subparas d and e must be applied when wake turbulence separation is required.

REFERENCE—

SAME, RECIPROCAL AND CROSSING TRACKS, Para 1-2-2.

b. ***ATMS Multi Sensor Mode:*** Vertical separation between aircraft may be discontinued when they are on opposite tracks as defined in para 1-2-2, SAME, RECIPROCAL AND CROSSING TRACKS; and

1. You are in communications with both aircraft involved; and
2. You tell the pilot of one aircraft about the other aircraft, including position, direction, type; and
3. One pilot reports having seen the other aircraft and that the aircraft have passed each other; and
4. You have observed that the radar targets have passed each other; and
5. You have advised the pilots if either aircraft is classified as a SUPER or HEAVY aircraft.
6. Although vertical separation may be discontinued, the requirements of para 5-5-4, MINIMA, subparas d. And e. must be applied when wake turbulence separation is required.

EXAMPLES:

“Traffic, twelve o'clock, Boeing seven twenty seven, opposite direction. Do you have it in sight?”

(If the answer is in the affirmative):

“Report passing the traffic.”

(When pilot reports passing the traffic and the targets confirm that the traffic has passed, issue appropriate control instructions.)

5-5-8 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:

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

REFERENCE—

FORMATION FLIGHTS, Para 2-1-14.

APPLICATION, Para 5-5-1.

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

c. 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.

d. 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 para 5-5-8, 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 heavier aircraft than the lead aircraft (to which the prescribed wake turbulence separation has been applied).

5-5-9 ADJACENT AIRSPACE

a. 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:

REFERENCE—

COORDINATE USE OF AIRSPACE, Para 2-1-15.

1. Area applicable to 3 mile separation-- 1 1/2 miles.

2. Others – 2 1/2 miles.

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

1. Area applicable to 3 mile separation– 3 miles.

2. Others – 5 miles.

c. The provisions of subparas a. and b. do not apply to VFR aircraft being provided Class C services. Ensure that the targets of these aircraft do not touch the boundary of adjacent airspace.

d. VFR aircraft approaching Class C or Class D 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 C or Class D 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.

5-5-10 EDGE OF SCOPE

Separate a radar-controlled aircraft climbing or descending through the level of an aircraft that has been tracked to the edge of the scope/display by 5 miles until nonradar separation has been established.

Section 6. VECTORING

5-6-1 APPLICATION

Vector aircraft:

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

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

c. At or above MVA or the minimum IFR altitude except as authorized for radar approaches, departures, special VFR and VFR operations, or by para 5-6-3, VECTORS BELOW MINIMUM ALTITUDE.

NOTE—

① VFR aircraft not at a level assigned by ATC may be vectored at any level. It's the responsibility of the pilot to comply with the applicable "Rules of the Air".

② Caution should be exercised when vectoring VFR flights so as to ensure that the aircraft does not enter IMC.

REFERENCES:

MINIMUM EN ROUTE ALTITUDE, Para 4-5-5.

PRIORITY, Para 7-4-2.

LEVEL ASSIGNMENT, Para 7-4-4.

MINIMUM SAFE ALTITUDES, "Rules of the Air", Article 60.

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

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

f. Vectoring of Special VFR, only in special circumstances such as emergencies.

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

PHRASEOLOGY:

MAINTAIN VISUAL TERRAIN CLEARANCE.

REFERENCE—

ROUTE USE, Para 4-4-1.

VISUAL SEPARATION, Para 7-2-1.

SEPARATION, Para 7-4-3.

APPLICATION, Para 7-5-1.

5-6-2 METHODS

a. Vector aircraft by specifying:

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

PHRASEOLOGY:

TURN LEFT/RIGHT HEADING (degrees).

FLY HEADING (degrees).

CONTINUE PRESENT HEADING.

DEPART (fix) HEADING (degrees).

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

PHRASEOLOGY:

TURN (number of degrees) DEGREES LEFT/RIGHT.

3. 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.

b. 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 LOA.

c. When vectoring or approving course deviations, assign an altitude to maintain and, if necessary, a speed, when:

   1. The vector or approved deviation is off an assigned procedure which contains altitude or speed restrictions, i.e., instrument approach, etc.
   2. The previously issued clearance included crossing restrictions.
   3. The vector or approved deviation is off an assigned procedure that contains published altitude or speed restrictions, i.e., SID, STAR, and a clearance to Climb Via/Descend Via has been issued.

   REFERENCE—
   ROUTE OR LEVEL AMENDMENTS, Para 4-2-4.
   DEPARTURE CLEARANCES, Para 4-3-2.
   CLEARANCE INFORMATION, Para 4-7-1.

d. When vectoring or approving an aircraft to deviate off of a procedure that includes published altitude or speed restrictions, advise the pilot if you intend on clearing the aircraft to resume the procedure.

   PHRASEOLOGY:

   FLY HEADING (degrees), MAINTAIN (level), (if necessary, MAINTAIN (speed)), EXPECT TO REJOIN (SID, STAR, etc.).

   DEVIATION (restrictions if necessary) APPROVED,

   MAINTAIN (level), (if necessary, MAINTAIN (speed)),

   EXPECT TO REJOIN (SID, STAR, etc.) AT (NAVAID, fix, waypoint).

   NOTE—

   After a climb via or descend via clearance has been issued, a vector/deviation off of a SID/STAR cancels all published altitude and speed restrictions on the procedure. The aircraft's Flight Management System (FMS) may be unable to process crossing altitude restrictions once the aircraft leaves the SID/STAR lateral path. Without an assigned altitude, the aircraft's FMS may revert to leveling off at the altitude set by the pilot, which may be the SID/STAR published top or bottom altitude.

   REFERENCE—

DEPARTURE CLEARANCES, Para 4-3-2.
CLEARANCE INFORMATION, Para 4-7-1.

e. Provide radar navigational guidance until the aircraft is:

1. Established within the airspace to be protected for the nonradar route to be flown, or
2. On a heading that will, within a reasonable distance, intercept the nonradar route to be flown, and
3. Informed of its position unless the aircraft is RNAV, FMS or DME equipped and being vectored toward a VORTAC/TACAN or a waypoint and within the service volume of the NAVAID.

PHRASEOLOGY:

(position information), RESUME OWN NAVIGATION,

or

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

or

REJOIN (name/SID/STAR/procedure).

REFERENCE—

NAVAID USE LIMITATIONS, Chapter 4, Section 1.

f. Aircraft instructed to resume a procedure which contains published crossing restrictions (SID/STAR) must be issued/reissued all applicable restrictions or be instructed to Climb Via/Descend Via.

PHRASEOLOGY:

CLEARED DIRECT (NAVAID, fix, waypoint) ,〔REJOIN SID/STAR〕,[CROSS (NAVAID, fix, waypoint) AT/AT OR ABOVE/AT OR BELOW (level)], then CLIMB VIA/DESCEND VIA SID/STAR.

or if the pilot does not have knowledge of which SID/STAR to rejoin,

CLEARED DIRECT (NAVAID, fix, waypoint),〔REJOIN (SID name/STAR name)〕,〔CROSS (NAVAID, fix, waypoint) AT/AT OR ABOVE/AT OR BELOW (level)〕, then CLIMB VIA/DESCEND VIA SID/STAR.

EXAMPLE:

① *"Cleared direct Whiskey Papa seven three eight, then descend via Lugia Two Bravo RNAV Arrival, maintain four thousand."*

② *"Cleared direct Whiskey Papa five five two, rejoin SID, cross Whiskey Papa five five two at or above four thousand, then climb via SID, maintain flight level two zero zero."*

REFERENCE—

DEPARTURE CLEARANCES, Para 4-3-2
CLEARANCE INFORMATION, Para 4-7-1.

g. Aircraft vectored off an RNAV route shall be recleared to the next waypoint or as requested by the pilot.

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

i. Inform the pilot when a vector will take the aircraft across a previously assigned nonradar route.

PHRASEOLOGY:

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

REFERENCE—

APPLICATION, Para 7-6-1.

5-6-3 VECTORS BELOW MINIMUM ALTITUDE

Except in areas where more than 3 miles separation minima is required, you may vector a departing IFR aircraft,

or one executing a missed approach, within 40 miles of the radar and before it reaches the minimum level 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 obstacles and the aircraft is climbing to a level at least 1,000 feet above the obstacles, vector the aircraft to maintain at least 3 miles separation from the obstacles until the aircraft reports leaving a level above the obstacles.

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

Section 7. SPEED ADJUSTMENT

5-7-1 APPLICATION

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.

a. Consider the following when applying speed control:
   1. Determine the interval required and the point at which the interval is to be accomplished.
   2. Implement speed adjustment based on the following principles:
      (a) Priority of speed adjustment instructions is determined by the relative speed and position of the aircraft involved and the spacing requirement.
      (b) Speed adjustments are not achieved instantaneously. Aircraft configuration, levels, and speed determine the time and distance required to accomplish the adjustment.
   3. Use the following techniques in speed control situations:
      (a) Compensate for compression when assigning air speed adjustment in an in-trail situation by using one of the following techniques:
         (1) Reduce the trailing aircraft first.
         (2) Increase the leading aircraft first.
      (b) Assign a specific airspeed if required to maintain spacing.
      (c) Allow increased time and distance to achieve speed adjustments in the following situations:
         (1) Higher levels.
         (2) Greater speed.
         (3) Clean configurations.
      (d) Ensure that aircraft are allowed to operate in a clean configuration as long as circumstances permit.
      (e) Keep the number of speed adjustments per aircraft to the minimum required to achieve and maintain spacing.

b. Do not assign speed adjustment to aircraft:

   NOTE—
   When an aircraft is heavily loaded and at a high level, its ability to change speed may, in some cases, be very limited.

   1. Executing a published high level instrument approach procedure.
   2. In a holding pattern.

      REFERENCE—
      HOLDING INSTRUCTIONS – Para 4-6-4.

   3. After the aircraft has passed a point 4 miles from the threshold on final approach.

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

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

NOTE−

Pilots are required to comply with published speed restrictions.

e. A speed restriction published as part of a SID/STAR is canceled when an aircraft is vectored off, or a deviation from the SID/STAR is approved. If necessary, assign a speed in conjunction with the vector or approval to deviate.

NOTE−

The last published speed on a STAR will be maintained by the aircraft until ATC deletes it, assigns a new speed, issues a vector, assigns a direct route or issues an approach clearance.

f. When issuing speed adjustments to aircraft cleared along a route or procedure that has published speed restrictions, if feasible, advise the pilot where you intend on allowing the aircraft to resume the published speed.

NOTE−

If it is anticipated that an aircraft will be allowed to resume the published speeds on a procedure, advising the pilot where that may occur avoids flight crews from unnecessarily deleting speeds from the Flight Management System.

g. Express speed adjustments in terms of knots based on indicated airspeed (IAS) in 5-knot increments. At or above FL 250, speeds may be expressed in terms of Mach numbers in 0.01 increments for aircraft with Mach meters (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.*

② *When assigning speeds to achieve spacing between aircraft at different levels, consider that ground speed may vary with level. Further speed adjustment may be necessary to attain the desired spacing.*

REFERENCE—

METHODS, Para 5-7-2.

5-7-2 METHODS

a. Instruct aircraft to:

1. Maintain present speed.
2. Maintain specified speed or greater/less.
3. Increase or reduce to a specified speed or by a specified number of knots.
4. Maintain ‘maximum speed’, ‘minimum clean speed’ or ‘minimum speed’.

NOTE—

“Minimum clean speed” signifies the minimum speed at which an aircraft can be flown in a clean configuration, i.e. without deployment of lift-augmentation devices, speed brakes or landing gear.

PHRASEOLOGY:

REPORT SPEED or MACH NUMBER..

MAINTAIN PRESENT SPEED.

MAINTAIN [SPEED] (specific speed) KNOTS.

MAINTAIN (specific speed) KNOTS OR GREATER/LESS.

MAINTAIN MAXIMUM SPEED

MAINTAIN MACH (number) [OR GREATER (or OR LESS)][UNTIL (significant point)];

INCREASE/REDUCE SPEED:

TO (specified speed) KNOTS,

or

TO MACH (mach number).

DO NOT EXCEED (speed) KNOTS or MACH(number)
REDUCE TO MINIMUM CLEAN SPEED.

REDUCE TO MINIMUM APPROACH SPEED.

REDUCE TO APPROACH SPEED.

REDUCE TO MINIMUM SPEED.

RESUME NORMAL SPEED.

EXAMPLES:

"Increase speed to Mach point seven two."

"Reduce speed to two five zero knots."

"Maintain two eight zero knots."

"Maintain maximum speed."

NOTE—

① *A pilot operating at or above 10,000 feet MSL on an assigned speed adjustment greater than 250 knots is expected to comply with "ICAO ANNEX 11" and "AIP" when cleared below 10,000 feet MSL without notifying ATC. Pilots are expected to comply with the other provisions of "ICAO ANNEX 11"and "AIP" without notification unless otherwise authorized by CAA.*

② *Phrase with non-specific speeds such as MAINTAIN MAXIMUM SPEED, MINIMUM CLEAN SPEED and REDUCE TO MINIMUM SPEED are primarily intended for use when sequencing a group of aircraft. As the sequencing plan develops, it may be necessary to determine the specific speed and/or make specific speed assignments.*

b. Only minor speed adjustment not exceeding plus/minus 20 knots IAS should be used for aircraft on intermediate and final approach:

c. 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.

1. Speed reductions prior to descent.

   PHRASEOLOGY:

   REDUCE SPEED:

   TO (specified speed)KNOTS,

   or

   (number of knots) KNOTS.

   THEN, DESCEND AND MAINTAIN (level).

2. Speed reduction following descent.

   PHRASEOLOGY:

   DESCEND AND MAINTAIN (level). THEN, REDUCE SPEED:

   TO (specified speed in knots)KNOTS.

   or

   TO MACH (mach number).

or

(number of knots) KNOTS.

NOTE—

When specifying descent prior to speed reduction, consider the maximum speed requirements specified in AIP, ENR 1.8.8. It may be necessary for the pilot to level off temporarily and reduce speed prior to descending below 10,000 feet MSL.

d. Specify combined speed/level fix crossing restrictions.

PHRASEOLOGY:

CROSS (fix) AT (level) AT (specified speed) KNOTS.

EXAMPLE:

"Cross Houlong at six thousand at two three zero knots.

REFERENCE—

NUMBERS USAGE, Para 2-4-18.

LEVEL INFORMATION, Para 4-5-6.

5-7-3 SPEED ASSIGNMENTS

When assigning airspeeds, use the following recommended minima:

a. To aircraft operating between FL280 and FL150, a speed not less than 250 knots or the equivalent Mach number.

NOTE—

On a standard day the Mach numbers equivalent to 250 knots CAS (subject to minor variations) are:

FL 240-0.60;

FL 250-0.61;

FL 260-0.62;

FL 270-0.64;

FL 280-0.65;

FL 290-0.66.

b. To arrival aircraft operating below FL150:

1. Turbojet aircraft:

(a) Assign a speed not less than 220 knots, or

(b) Assign a speed not less than 170 knots when the aircraft is within 20 flying miles of the runway threshold.

2. Reciprocating and turboprop aircraft:

(a) Assign a speed not less than 200 knots, or

(b) Assign a speed not less than 150 knots when the aircraft is within 20 flying miles of the runway threshold.

c. To departures:

1. Turbojet aircraft: assign a speed not less than 230 knots.

2. Reciprocating and turboprop aircraft: assign a speed not less than 150 knots.

d. To helicopters: assign a speed not less than 60 knots.

REFERENCE—

METHODS, Para 5-7-2.

5-7-4 TERMINATION

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. This does not relieve the pilot of those speed restrictions which are applicable to AIP, ENR 1.8.8.

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Section 8. RADAR DEPARTURES

5-8-1 PROCEDURES

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

5-8-2 INITIAL HEADING

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

PHRASEOLOGY:

FLY RUNWAY HEADING.

TURN LEFT / RIGHT, HEADING (degrees).

NOTE—

TERMINAL*: A purpose for the heading is not necessary, since pilots operating in a radar environment associate assigned headings with vectors to their planned route of flight.*

REFERENCE—

DEPARTURE CLEARANCES, Para 4-3-2.

VECTORS BELOW MINIMUM ALTITUDE, Para 5-6-3.

5-8-3 SUCCESSIVE OR SIMULTANEOUS DEPARTURES

TERMINAL

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 tracks will diverge by 15 degrees or more.

NOTE—

① *Flight procedure and airspace establish guidelines for IFR departure turning procedures which assumes a climb to 400 feet above the aerodrome elevation before a turn is commenced. The ILS missed approach criteria requires a straight climb of 400 feet be specified where turns greater than 15 degrees are required.*

② *Consider known aircraft performance characteristics when applying initial separation to successive departing aircraft.*

③ *When one or both of the departure surfaces is a helipad, use the takeoff track of the helicopter as a reference, comparable to the centerline of a runway and the helipad center as the threshold.*

a. Between aircraft departing the same runway/helipad or parallel runways/helicopter takeoff tracks separated by less than 760m/2,500 feet - 1 mile if tracks diverge immediately after departure (see FIG 5-8-1, FIG 5-8-2, and FIG 5-8-3.).

FIG 5-8-1**Successive Departures**

FIG 5-8-2 **Simultaneous Departures**

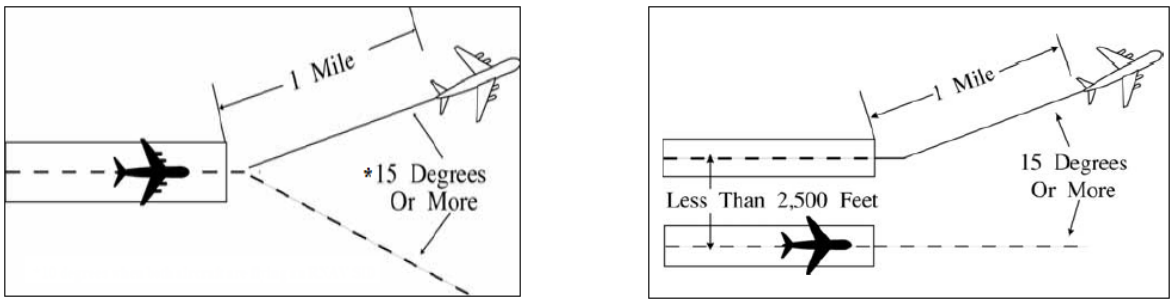
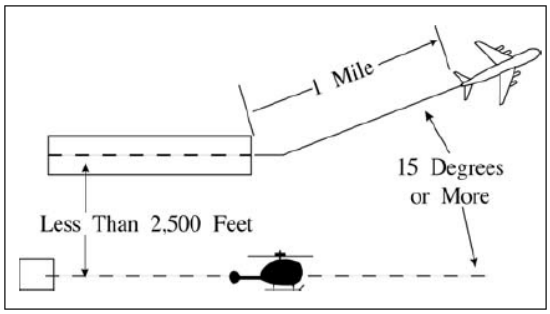


FIG 5-8-3 Simultaneous Departures



NOTE—

This procedure does not apply when wake turbulence separation is required.

REFERENCE—

WAKE TURBULANCE SEPARATION FOR INTERSECTION DEPARTURES, Para 3-9-8.

INTERSECTING RUNWAY SEPARATION, Para 3-9-9.

MINIMA, Para 5-5-4.

b. Between aircraft departing in the same direction from parallel runways/helicopter takeoff tracks: authorize simultaneous takeoffs if the centerlines/takeoff tracks are separated by at least 760m/2,500 feet and tracks diverge by 15 degrees or more immediately after departure (see FIG 5-8-4 and FIG 5-8-5.).

FIG 5-8-4 **Parallel Runway Departures**

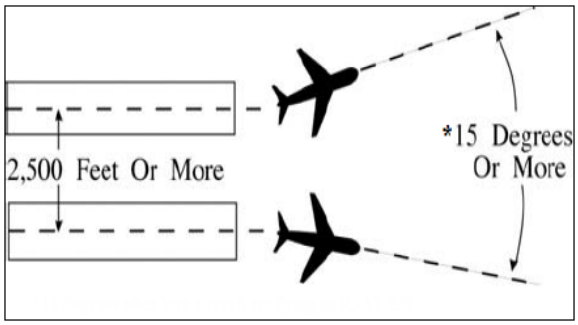
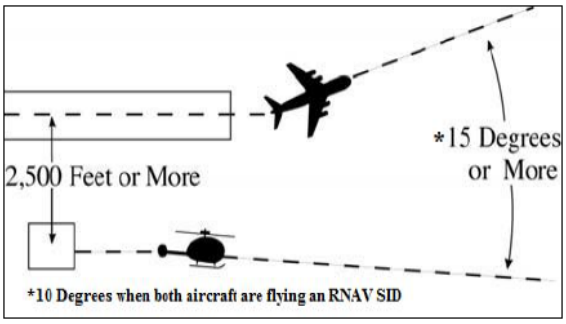


FIG 5-8-5 **Parallel Helicopter Track Departures**



5-8-4 DEPARTURE AND ARRIVAL

TERMINAL

Except as provided in para 5-8-5, DEPARTURES AND ARRIVALS ON PARALLEL 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 two miles from the runway at the time. This separation is determined at the time the departing aircraft commences takeoff roll.*

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.*

REFERENCE—

TRAFFIC CIRCUIT INSTRUCTIONS, Para 3-10-3

SAME RUNWAY SEPARATION, Para 3-10-4.

5-8-5 DEPARTURES AND ARRIVALS ON PARALLEL RUNWAYS

TERMINAL

Authorize simultaneous operations between an aircraft departing on a runway and an aircraft on final approach to another parallel runway if the departure track diverges immediately by at least 30 degrees from the missed approach track 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 track as the runway centerline and the helipad center as the threshold.

a. When parallel runway thresholds are even, the runway centerlines are at least 760m/2,500 feet apart (see FIG 5-8-6 and FIG 5-8-7).

FIG 5-8-6 **Parallel Thresholds are Even**

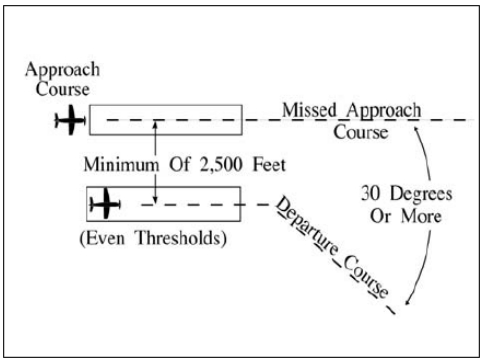
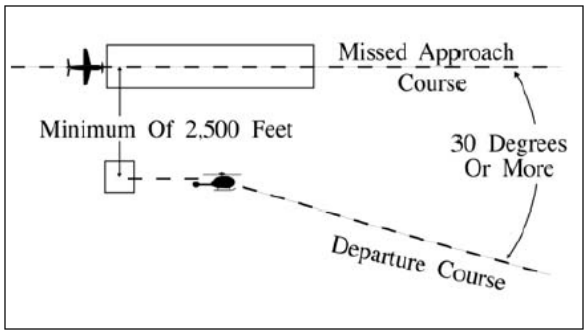


FIG 5-8-7 **Parallel Thresholds are Even**



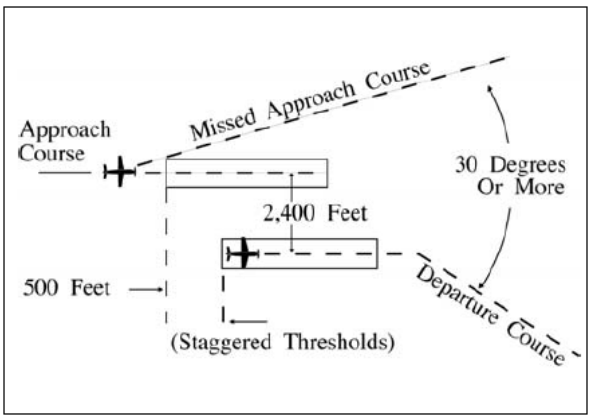
b. When parallel runway thresholds are staggered and the arriving aircraft is approaching the nearer runway:

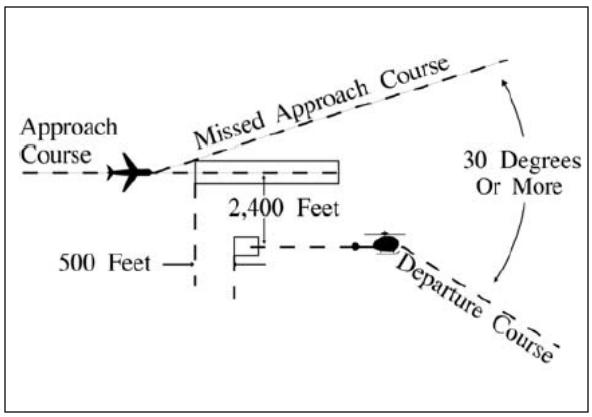
1. The centerlines are at least 305m/1000ft apart and the landing thresholds are staggered at least 150m/500ft for each 30m/100ft less than 760m/2,500ft the centrelines are separated (see FIG 5-8-8 and FIG 5-8-9.)

2. In the event of a missed approach by an aircraft requiring wake turbulence separation behind it, apply the procedures in 3-9-7 SAME RUNWAY SEPARATION, or para 3-9-9 INTERSECTING RUNWAY/INTERSECTING FLIGHT PATH SEPARATION ensuring that the heavier aircraft does not overtake or cross in front of a lighter aircraft departing from the adjacent parallel runway.

FIG 5-8-8 **Parallel Thresholds are Staggered**

FIG 5-8-9 **Parallel Thresholds are Staggered**





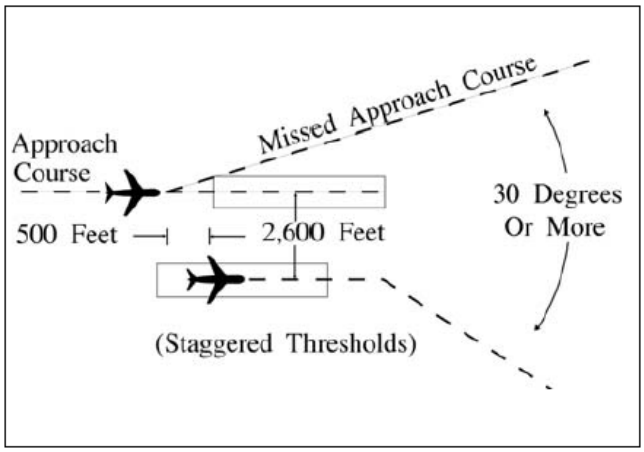
c. When parallel runway thresholds are staggered and the arriving aircraft is approaching the farther runway: the runway centerline separation exceeds 760m/2500ft by at least 30m/100ft for each 150m/500ft the landing thresholds are staggered (see FIG 5-8-10.)

d. When the aircraft on takeoff is a helicopter, hold the helicopter until visual separation is possible or apply the separation criteria in subparas a. b.

REFERENCE—

DEPARTURE AND ARRIVAL, Para 5-8-4.

FIG 5-8-10 **Parallel Thresholds are Staggered**



Section 9. RADAR ARRIVALS

5-9-1 VECTORS TO FINAL APPROACH COURSE

Prior to, or upon commencement of radar vectoring for approach, advise the pilot of the type of approach as well as the runway to be used. Except as provided in para 7-3-2, VECTORS FOR VISUAL APPROACH, vector arriving aircraft to intercept the final approach course:

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

   1. When the reported ceiling is at least 500 feet above the MVA/MIA and the visibility is at least 5 KM (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.

   2. 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 RNAV approach.

b. Provide a minimum of 1,000 feet vertical separation between aircraft on opposite base legs unless another form of approved separation is established during turn-on to final approach.

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

d. For a nonprecision approach, at a level 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 subparas a. and c.

e. ***EN ROUTE*:** The following provisions are required before an aircraft may be vectored to the final approach course:

   1. The approach gate and a line (solid or broken) depicting the final approach course starting at or passing through the approach gate and extending away from the aerodrome, be displayed on the radar scope; for a precision approach, the line length shall extend at least the maximum range of the localizer; for a nonprecision approach, the line length shall extend at least 10NM outside the approach gate; and,

   2. The maximum range selected on the radar display is 150 NM, or;

   3. An adjacent radar display is set at 125 NM or less, configured for the approach in use, and is utilized for the vector to the final approach course.

   4. If unable to comply with 1., 2., or 3. above, issue the clearance in accordance with para 4-8-1, APPROACH CLEARANCE.

REFERENCE—

APPROACH CLEARANCE, Para 4-8-1.

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

5-9-2 FINAL APPROACH COURSE INTERCEPTION

a. When vectoring for final approach, issue a heading or a series of headings calculated to close with the final approach course. Ensure that the final vector enables the aircraft to be established in level flight on the final approach track prior to intercepting the specified or nominal glide path if an ILS or radar approach is to be made.

b. Assign headings that will permit final approach course interception on a track that does not exceed the

interception angles specified in the TBL 5-9-1.

TBL 5-9-1 Approach Course Interception Angle	
Distance from interception point to approach gate	**Maximum interception angle**
Less than 2 NM from approach gate	20 degrees
2 NM or more from approach gate	30 degrees 45 for helicopters
12 NM or more from runway	45 degrees

NOTE—

APPROACH GATE− An imaginary point used within ATC as a basis for vectoring aircraft to the final approach course. The gate will be established along the final approach course 1 mile from the final approach fix on the side away from the aerodrome and will be no closer than 5 miles from the landing threshold.

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

1. Outside the approach gate: apply procedures in accordance with subpara b., if necessary, vector the aircraft for another approach.
2. 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 RIGHT/LEFT OF COURSE, SAY INTENTIONS.

NOTE—

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

REFERENCE—

CHAPTER 5 SECTION 9. RADAR ARRIVAL and SECTION 10. RADAR APPROACH – TERMINAL(MILITARY).

d. ***EN ROUTE***: When using a radar scope range above 125 NM, the controller shall solicit and receive a pilot report that the aircraft is established on the final approach course. If the pilot has not reported established by the final approach gate, inform the pilot of his observed position and ask intentions.

NOTE—

It may be difficult to accurately determine small distances when using very large range settings.

5-9-3 VECTORS ACROSS FINAL APPROACH COURSE

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 track unless approach clearance has been issued.

PHRASEOLOGY:

EXPECT VECTOR ACROSS FINAL FOR (purpose).

EXAMPLE:

"Expect vector across final for spacing."

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para.5-9-2.

5-9-4 ARRIVAL INSTRUCTIONS

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

a. 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.

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

c. Approach clearance except when conducting a radar approach. Issue approach clearance only after the aircraft is:

1. Established on a segment of a published route or instrument approach procedure, or
(see FIG 5-9-1 Example 1.)

2. Assigned a level to maintain until the aircraft is established on a segment of a published route or instrument approach procedure.
(see FIG 5-9-2)

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 5-9-1)*

② *Aircraft 2 is being vectored to a published segment of the final approach course, four 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 5-9-1)*

③ *Aircraft 3 is being vectored to intercept the final approach course beyond the approach segments, 5 mils from Alfa at 5,000 feet. The MVA for this area is 4,000 feet. "Five miles from Alfa. Turn right heading three three zero. Cross Alfa at or above four thousand. Cleared I-L-S Runway Three Six Approach." (See Figure FIG 5-9-1).*

④ *Aircraft 4 is established on the final approach course beyond the approach segments, eight miles from Alfa at 6,000 feet. The MVA for this area is 4,000 feet. "Eight miles from Alfa. Cross Alfa at or above four thousand. Cleared I-L-S Runway Three Six Approach." (See FIG 5-9-1).*

EXAMPLE:

The aircraft is being vectored to a published segment of the ILS final approach course, three miles from Alfa at 4,000 feet. The MVA for this area is 4,000 feet. "Three miles from Alfa. Turn left heading two one zero. Maintain four thousand until established on the localizer course. Cleared ILS Runway One Eight Approach." (See FIG 5-9-2).

Note—

The level 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.

FIG 5-9-1 Arrival Instructions

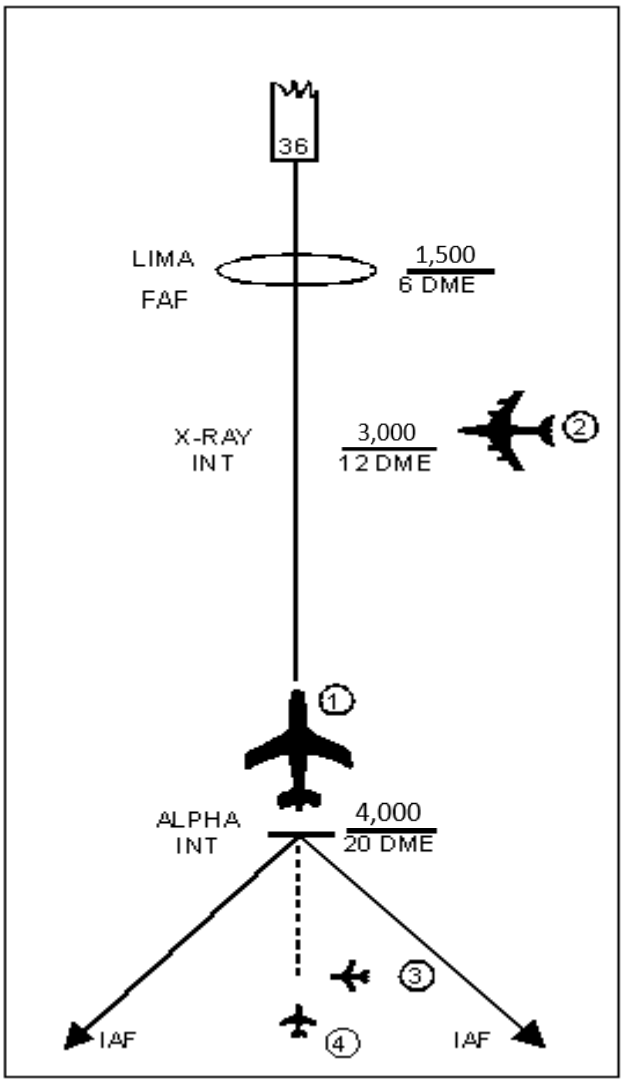
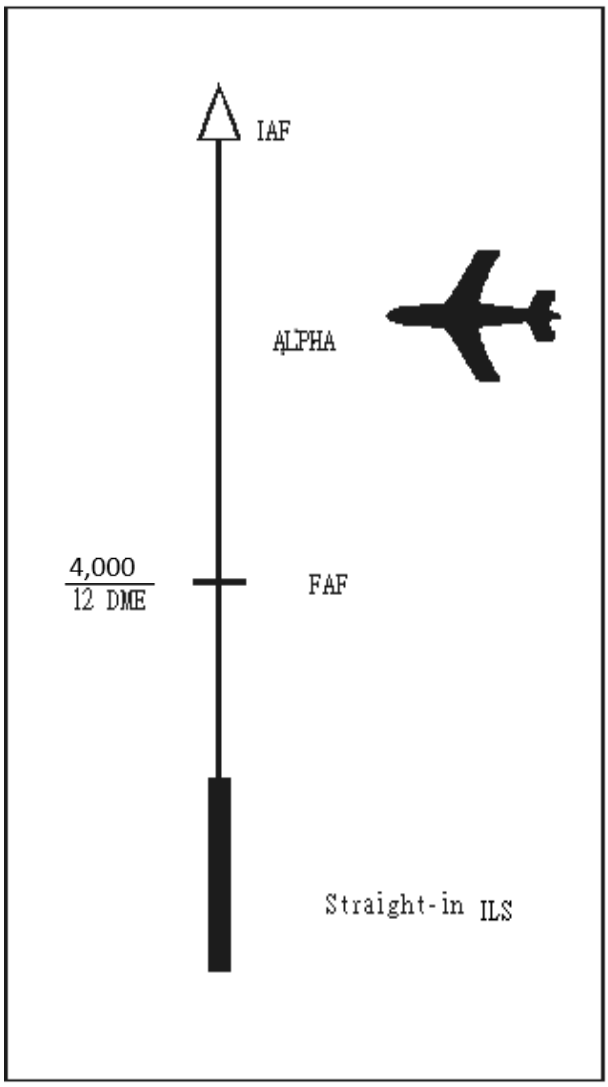


FIG5-9-2 Arrival Instructions



d. 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 ATS surveillance service. When this occurs, it will be necessary to relay tower clearances or instructions to preclude changing frequencies prior to landing or approach termination.

1. Monitor local control frequency, reporting to the tower when over the approach fix.
2. Contact the tower on local control frequency.
3. Contact the final controller on the appropriate frequency if radar service will be provided on final on a different frequency.

REFERENCE—
FINAL CONTROLLER CHANGEOVER, Para 5-10-8.

4. When radar is used to establish the final approach fix, inform the pilot that after being advised that he is over the fix he 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 decimal 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.

   REFERENCE—
   FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

5-9-5 APPROACH SEPARATION RESPONSIBILITY

a. 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.

   NOTE—
   The radar controller may be a controller in TACC, a terminal unit, or a tower controller when authorized to perform the approach control function in a terminal area.

   REFERENCE—
   WAKE TURBULENCE, Para 2-1-20.
   APPLICATION (RADAR SEPARATION), Para 5-5-1.
   VISUAL SEPARATION, Para 7-2-1.
   MINIMA, Para 5-5-4.

b. When timed approaches are being conducted, the radar controller shall maintain the radar separation specified in para 6-7-5, INTERVAL MINIMA, until the aircraft is observed to have passed the final approach fix inbound and is within 5 miles of the runway on the final approach track or until visual separation can be provided by the tower.

REFERENCE—
ACCEPTING CONTROLLER HANDOFF, Para 5-4-6.
FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.
APPROACH SEQUENCE, Para 6-7-2.

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Section 10. RADAR APPROACHES – TERMINAL (MILITARY)

5-10-1 APPLICATION

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

b. 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.

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-2 APPROACH INFORMATION

a. 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 subpara 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.

REFERENCE—

TERMINAL INFORMATION, Para 4-7-8.

1. Altimeter setting.
2. If available ceiling and visibility if the ceiling at the aerodrome of intended landing is reported below 1,500 Feet or below the highest circling minimum, whichever is greater, or if the visibility is less than 5 KM. Advise pilots when weather information is available via the Automated Weather Observation System (AWOS).
3. 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.
4. Pertinent information on known aerodrome conditions if they are considered necessary to the safe operation of the aircraft concerned.
5. Lost communication procedures as specified in para 5-10-4, LOST COMMUNICATIONS.

b. Before starting final approach:

NOTE—

① 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.

②. Occasionally, copter PAR approaches are available to runways where conventional PAR approaches have been established. In those instances where the two PAR approaches serve the same runway, the copter approach will have a steeper glide slope and a lower decision height. By the controller's designating the approach to be flown, the helicopter pilot understands which of the two approaches he has been vectored for and which set of minima apply.

1. 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 PAR/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.

2. 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 Three Two One this will be a surveillance approach to a missed approach point, three point five miles south of Tainan Aerodrome.

REFERENCE—

ELEVATION FAILURE, Para 5-12-9.

c. 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.

REFERENCE—

ALTIMETER SETTING ISSUANCE BELOW LOWEST USABLE FLIGHT LEVEL, Para 2-7-2.

FINAL APPROACH COURSE INTERSECTION, Para 5-9-2.

5-10-3 NO-GYRO APPROACH

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

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

PHRASEOLOGY:

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

b. Instruct the aircraft when to start and stop turn.

PHRASEOLOGY:

TURN LEFT/RIGHT.

STOP TURN.

c. 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.

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-4 LOST COMMUNICATIONS

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):

NOTE—

Air traffic control units at military installations are not required to transmit lost communications instructions to military aircraft. All Military units will issue specific lost communications instructions to civil aircraft when required.

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

1. Attempt contact on a secondary, or tower frequency.
2. Proceed in accordance with visual flight rules, if possible.
3. Proceed with an approved nonradar 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 (nonradar approach). MAINTAIN (level) UNTIL ESTABLISHED ON/OVER/FIX/NAVAID/APPROACH PROCEDURE,

or

(alternative instructions).

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

c. If the pilot states that he 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.

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

APPROACH INFORMATION, Para 5-10-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-5 RADAR CONTACT LOST

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.

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

FINAL APPROACH ABNORMALITIES, Para 5-10-14.

ELEVATION FAILURE, Para 5-12-9.

5-10-6 LANDING CHECK

Advise the pilot to perform landing check while the aircraft is on downwind leg and in time to complete it before turning base leg. If an incomplete pattern is used, issue this before handoff to the final controller for a PAR approach, or before starting descent on final approach for surveillance approach.

PHRASEOLOGY:

PERFORM LANDING CHECK

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-7 POSITION INFORMATION

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

PHRASEOLOGY:

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

or

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

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-8 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).

REFERENCE—

RADIO COMMUNICATIONS TRANSFER, Para 2-1-18.

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ARRIVAL INSTRUCTIONS, Para 5-9-4.

ELEVATION FAILURE, Para 5-12-9.

5-10-9 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 READ?

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-10 TRANSMISSION ACKNOWLEDGMENT

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.

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-11 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).

NOTE—

① The specific missed approach procedure is published on applicable military document.

② At locations where missed approach instructions are published in base flying regulations, controllers need not issue missed approach instruction to locally assigned/attached aircraft.

5-10-12 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 instructions must include a specific heading and level except when the aircraft will maintain VFR and contact the tower.

PHRASEOLOGY:

AFTER COMPLETING LOW APPROACH/TOUCH AND GO:

CLIMB AND MAINTAIN (level).

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

or

MAINTAIN VFR, CONTACT TOWER,

or

(other instructions as appropriate).

NOTE—

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

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-13 TOWER CLEARANCE

a. 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.

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

PHRASEOLOGY:

TOWER CLEARANCE CANCELED/NOT RECEIVED (alternative instructions).

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

5-10-14 FINAL APPROACH ABNORMALITIES

When a radar approach cannot be continued due to any circumstance, inform the aircraft immediately. If the runway environment is not in sight, instruct the aircraft to: execute a missed approach if missed approach instructions have previously been given; or, climb to or maintain a specified level and fly a specified track. Give these instructions whenever the completion of a safe approach is questionable because one or more of the following conditions exists. The conditions in subpara a., b., and c. do not apply after the aircraft has passed decision height on a PAR approach.

EXAMPLES:

Typical reasons for issuing missed approach instructions.:

“Radar contact lost.”

“Too high/low for safe approach.”

“Too far right/left for safe approach.”

REFERENCE—

POSITION ADVISORIES, Para 5-12-7.

a. Safety limits are exceeded or radical target deviations are observed.

b. Position or identification of the aircraft is in doubt.

c. Radar contact is lost or a 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.

REFERENCE—

RADAR CONTACT LOST, Para 5-10-5.

d. Aerodrome conditions or traffic preclude approach completion.

PHRASEOLOGY:

GO AROUND/(alternative instructions). (Reason).

REFERENCE—

FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

ELEVATION FAILURE, Para 5-12-9.

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Section 11. SURVEILLANCE APPROACHES – TERMINAL (MILITARY)

5-11-1 LEVEL INFORMATION

Provide recommended levels on final approach if the pilot requests. If recommended levels are requested, inform the pilot that recommended levels which are at or above the published MDA will be given for each mile on final.

REFERENCE—

FINAL APPROACH GUIDANCE, Para 5-11-5.

5-11-2 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.

5-11-3 DESCENT NOTIFICATION

a. 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 a level limiting step-down-fix is prescribed.

b. 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 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 not voluntarily given ,solicit the aircraft approach category from the pilot, and then issue him the applicable circling MDA.

   PHRASEOLOGY:

   PREPARE TO DESCEND IN (number) MILE/S.

   for straight-in approaches,

   MINIMUM DESCENT ALTITUDE (level).

   for circling Approaches,

   REQUEST YOUR AIRCRAFT APPROACH CATEGORY.

   (Upon receipt of aircraft approach category), PUBLISHED CIRCLING MINIMUM DESCENT ALTITUDE (level).

5-11-4 DESCENT INSTRUCTIONS

When an aircraft reaches the descent point, issue one of the following as appropriate:

REFERENCE—

ELEVATION FAILURE, Para 5-12-9.

a. Unless a descent restriction exists, advise the aircraft to descent to the MDA.

PHRASEOLOGY:

(Number) MILES FROM RUNWAY/AERODROME/HELIPORT. DESCEND TO YOUR MINIMUM DESCENT ALTITUDE.

b. When a descent restriction exists, specify the prescribed restriction level. When the aircraft has passed the level limiting point, advise to continue descent to MDA.

PHRASEOLOGY:

(Number) MILES FROM RUNWAY/AERODROME/HELIPORT. DESCEND AND MAINTAIN (restriction level).

DESCEND TO YOUR MINIMUM DESCENT ALTITUDE.

5-11-5 FINAL APPROACH GUIDANCE

a. Issue track guidance, inform the aircraft when it is on track and frequently inform the aircraft of any deviation from track. Transmission with aircraft on Surveillance final approach should occur approximately every 15 seconds.

PHRASEOLOGY:

HEADING (heading), ON TRACK/COURSE,

or

SLIGHTLY/WELL LEFT/RIGHT OF TRACK/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.

b. 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.

EXAMPLES:

“Going left/right of track/course.”

“Left/right of track/course and holding/correcting.”

c. 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.

d. Recommended levels shall be furnished, if requested, in accordance with para 5-11-1, LEVEL INFORMATION.

PHRASEOLOGY:

If requested,

LEVEL SHOULD BE (level).

5-11-6 APPROACH GUIDANCE TERMINATION

a. Discontinue surveillance approach guidance when:

1. Requested by the pilot.

2. In your opinion, continuation of a safe approach to the MAP is questionable.
3. The aircraft is over the MAP.

b. 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 reports able to proceed to the landing area by visual reference to a prescribed surface route.

c. When approach guidance is discontinued in accordance with subpara 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,

or

OVER MISSED APPROACH POINT.

PROCEED VISUALLY (additional instructions/clearance as required).

d. When approach guidance is discontinued in accordance with subpara a. 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,

or

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.

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Section 12. PAR APPROACHES – TERMINAL (MILITARY)

5-12-1 GLIDEPATH NOTIFICATION

Inform the aircraft when it is approaching glidepath (approximately 10 to 30 seconds before final descent).

PHRASEOLOGY:

APPROACHING GLIDEPATH.

5-12-2 DECISION HEIGHT (DH) NOTIFICATION

Provide the DH to any pilot who requests it.

PHRASEOLOGY:

DECISION HEIGHT (number of feet).

5-12-3 DESCENT INSTRUCTION

When an aircraft reaches the point where final descent is to start, instruct it to begin descent.

PHRASEOLOGY:

BEGIN DESCENT.

5-12-4 GLIDEPATH AND TRACK/COURSE INFORMATION

a. Issue track/course guidance and inform the aircraft when it is on glidepath and on track/course, and frequently inform the aircraft of any deviation from glidepath or track/course. Transmissions with aircraft on precision final approach should occur approximately every 5 seconds.

   PHRASEOLOGY:

   HEADING (heading) ON GLIDEPATH. ON TRACK/COURSE,

   or

   SLIGHTLY/WELL ABOVE/BELOW GLIDEPATH.

   SLIGHTLY/WELL LEFT/RIGHT OF TRACK/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.

b. Issue trend information as required, to indicate target position with respect to the azimuth and elevation cursors and to describe target movement as appropriate corrections are issued. Trend information may be modified by the terms “RAPIDLY” or “SLOWLY” as appropriate.

   EXAMPLE-

   “Going above/below glidepath.”

   “Going right/left of course/track.”

   “Above/below glidepath and coming down/up.”

   “Above/below glidepath and holding.”

   “Left/right of track/course and holding/correcting.”

REFERENCE—
POSITION ADVISORIES, Para 5-12-7.
MONITOR INFORMATION, Para 5-13-3.

5-12-5 DISTANCE FROM TOUCHDOWN

Inform the aircraft of its distance from touchdown at least once each mile on final approach.

PHRASEOLOGY:

(Number of miles) MILES FROM TOUCHDOWN.

5-12-6 DECISION HEIGHT

Inform the aircraft when it reaches the published decision height.

PHRASEOLOGY:

AT DECISION HEIGHT.

5-12-7 POSITION ADVISORIES

a. Continue to provide glidepath and track information prescribed in para 5-12-4, GLIDEPATH AND TRACK INFORMATION, subparas a. and b. until the aircraft passes over threshold.

NOTE—
Glidepath and track information provided below decision height is advisory only and pilot should be responsible for descent below decision height.

b. Inform the aircraft when it is passing over the approach lights.

PHRASEOLOGY:

OVER APPROACH LIGHTS.

c. Inform the aircraft when it is passing over the landing threshold and inform it of its position with respect to the final approach track.

PHRASEOLOGY:

OVER LANDING THRESHOLD, (position with respect to track).

REFERENCE—
FINAL APPROACH ABNORMALITIES, Para 5-10-14.

5-12-8 COMMUNICATION TRANSFER

Issue communications transfer instructions.

PHRASEOLOGY:

CONTACT (terminal control function) (frequency, if required) AFTER LANDING.

NOTE—
Communications transfer instructions should be delayed slightly until the aircraft is on the landing roll-out to preclude diversion of the pilot's attentions during transition and touchdown.

REFERENCE—
RADIO COMMUNICATION TRANSFER, Para 2-1-18.

5-12-9 ELEVATION FAILURE

a. If the elevation portion of PAR equipment fails during a precision approach:

1. Discontinue PAR instructions and tell the aircraft to take over visually or, if unable, to execute a missed approach. If the aircraft executes a missed approach, apply subpara 2. below.

PHRASEOLOGY:

NO GLIDEPATH(or GLIDESLOPE) INFORMATION AVAILABLE. IF RUNWAY, APPROACH/ RUNWAY LIGHTS, NOT IN SIGHT, EXECUTE MISSED APPROACH/ (alternative instructions).

2. If a surveillance approach, ASR or PAR without glide slope, is established for the same runway, inform the aircraft that a surveillance approach can be given. Use ASR or the azimuth portion of the PAR to conduct the approach and apply Chapter 5. RADAR, Section 11. SURVEILLANCE APPROACHES – TERMINAL. When the PAR azimuth is used, inform the pilot that mileage information will be from touchdown, and at those runways where specific minima have been established for PAR without glideslope, inform the pilot that the PAR azimuth will be used for the approach.

EXAMPLES:

(a) Approach information when PAR azimuth used:

"This will be a surveillance approach to Runway Three Six. Mileages will be from touchdown," or

"This will be a surveillance approach to Runway Three Six using P-A-R azimuth. Mileages will be from touchdown."

(b) Descent instructions:

"Five miles from touchdown, descent to your minimum descent altitude/minimum level."

REFERENCE—

APPROACH INFORMATION, Para 5-10-2.

FINAL APPROACH ABNORMALITIES, Para 5-10-14

DESCENT INSTRUCTIONS, Para 5-11-4.

b. If the elevation portion of the PAR equipment is inoperative before starting a precision approach, apply para 5-12-9, ELEVATION FAILURE, subpara a.2.

5-12-10 SURVEILLANCE UNUSABLE

PAR approaches may be conducted when the ASR is unusable provided a nonradar instrument approach will position the aircraft over a navigational aid or DME fix within the precision radar coverage, or an adjacent radar unit can provide a direct radar handoff to the PAR controller.

NOTE—

The display of the NAVAID or DME fix in accordance with para 5-3-2, PRIMARY RADAR IDENTIFICATION METHODS, is not required provided the NAVAID or DME fix can be correlated on a PAR scope.

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Section 13. AUTOMATION – ATMS

5-13-1 APPLICATION

ATMS may be used for identifying aircraft assigned a discrete beacon code, maintaining identity of targets, and performing handoffs of these targets between controllers.

Note—

ATMS is to assist controllers in exercising enroute, terminal and aerodrome control tasks.

5-13-2 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.

5-13-3 FUNCTIONAL USE

In addition to other uses specified herein, ATMS may be used for the following functions:

a. Tracking

b. Handoff.

c. Level information.

REFERENCE—

ALTITUDE FILTERS, Para 5-2-17.

d. Coordination

e. Ground speed

f. Identification.

5-13-4 SYSTEM REQUIREMENTS

Use the ATMS as follows:

Note—

Locally developed procedures, operating instructions, and training material are required because of differences in equipment capability. Such locally developed procedures shall be supplemental to those contained in this section and shall be designed to make maximum use of the ATMS equipment.

a. Inform all appropriate positions before terminating or reinstating use of the ATMS at a control position. When terminating the use of the ATMS all pertinent flight data of that position shall be transferred or terminated.

b. Inform other interfaced units of scheduled and unscheduled shutdowns.

c. Initiate a track on all aircraft to the maximum extent possible. As a minimum, aircraft identification should be entered, and automated handoff functions should be used.

d. Do not use the automatic level readout of an aircraft under another controller's jurisdiction for vertical separation purposes without verbal coordination.

5-13-5 INFORMATION DISPLAYED AND DELIVERED

a. Use of the inhibit select switches to remove displayed information no longer required shall be in accordance with local directives, which should ensure maximum required use of the equipment.

b. Information displayed should be in accordance with local directives or letters of agreement.

c. . Information delivered between control positions and units shall be in accordance with local directives or letters of agreement.

5-13-6 SAFETY NETS AND MONITORING AIDS PROCESSING (SNMAP) ALERTS

Emergency alarms and warning alerts are provided in ATMS with simultaneous aural alerts and visual alarms to inform the controller of the potential safety threat. When an emergency/warning alert is displayed, immediately analyze the situation, and, if necessary, take the appropriate action to resolve the alert.

a. Emergency alarms

The controller is informed of an emergency alarm by the audio alert, the visual display of two-letter indicators and color box surrounding the involved track label and EFS, when ATMS detects an aircraft's certain SSR code change.

NOTE—

ATMS emergency alarms include Emergency (7700, EM), Hijack (7500, HJ) and Radio Failure (7600, RF) alarms.

b. Warning alerts.

The controller is informed of a warning alert by the audio alert, the visual display of warning indicators and color box surrounded the involved track label and EFS.

NOTE—

① ATMS warning alerts include Short Term Conflict Alert (ST), Mid-term Conflict Detection (MT), Minimum Safe Altitude Warning (MS), Danger Area Infringement Warning (DA), Approach Path Monitoring Warning (MS),Cleared Level Adherence Monitoring (CL), Route Adherence Monitoring (RA), Estimated Time Over Discrepancy (TO), Missed Position Report (MP), Segregated Airspace Probe (SA), Flight Plan Conflict Warning (FP), etc.

② Caution should be exercised when issuing a clearance to an aircraft in reaction to a MS/DA alert to ensure that adjacent MIA areas are not a factor.

REFERENCE—

SAFETY ALERT, Para 2-1-8.

c. The controller can acknowledge an emergency alarm/warning alert with the application of selecting the track label/EFS and using the ACK function.

NOTE—

The aural alert and color box surrounding the track label/EFS will be eliminated when the ACK function is utilized.

d. The controller can solely disengaged the aural alert for a specific aircraft with the application of the AUR function.

e. The suppression of warning alerts shall be in accordance with the unit directives.

f. 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.

5-13-7 LEVEL PROCESSING

a. The track label shall always reflect the current status of the aircraft unless otherwise specified in a unit directive. Whenever an aircraft is cleared to maintain a level different from that in the flight plan data base, enter into the computer the new cleared flight level if the aircraft will (climb or descend to and) maintain the new level.

b. Whenever Current Reported Level (CRL) information is either not available (INV) or is unreliable, enter

reported levels into the computer as follows:

NOTE—

Level updates are required to assure maximum accuracy in applying slant range correction formulas.

1. When an aircraft reaches the assigned level.
2. When an aircraft at an assigned level is issued a clearance to climb or descend.
3. A minimum of each 10,000 feet during climb to or descent from FL 130 and above.

c. The display of Mode C/MSTS targets and limited track labels is necessary for application of Merging Target Procedures. Sectors shall ensure the display of Mode C /MSTS targets and track labels by entering appropriate level limits and display filters to include, as a minimum, the level stratum of the sector plus:

1. 1,200 feet above the highest and below the lowest level or flight level of the sector where 1,000 feet vertical separation is applicable, and
2. 2,200 feet above the highest and below the lowest flight level of the sector where 2,000 feet vertical separation is applicable.

NOTE—

1. The track label, for purposes of this paragraph, must contain the aircraft identity (ACID, beacon code, 24-bit address and target ID) and Mode C altitude at a minimum.

2. Exception to these requirements may be authorized for specific levels in certain center sectors if defined in appropriate unit directives.

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Chapter 6. NON-RADAR

Section 1. GENERAL

6-1-1 DISTANCE

Use mileage-based (DME and/or ATD) procedures and minima only when direct pilot-controller communications are maintained.

6-1-2 NONRECEIPT OF POSITION REPORT

When a position report affecting separation is not received, take action to obtain the report no later than 5 minutes after the aircraft was estimated over the fix.

6-1-3 DUPLICATE POSITION REPORTS

Do not require an aircraft to make the same position report to more than one unit.

6-1-4 ARRIVAL MINMA

TERMINAL

WAKE TURBULENCE APPLICATION

Except as provided for in para 2-1-20 d., the following minima shall be applied

to aircraft landing behind a SUPER, a HEAVY or a MEDIUM aircraft:

a. HEAVY aircraft landing behind SUPER aircraft — 2 minutes;
b. MEDIUM aircraft landing behind SUPER aircraft — 3 minutes;
c. MEDIUM aircraft landing behind HEAVY aircraft — 2 minutes;
d. LIGHT aircraft landing behind SUPER aircraft — 4 minutes;
e. LIGHT aircraft landing behind a HEAVY or MEDIUM aircraft — 3 minutes.

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Section 2. INITIAL SEPARATION OF SUCCESSIVE DEPARTING AIRCRAFT

6-2-1 MINIMA ON DIVERGING TRACK

Separate aircraft that will fly track diverging by 45 degrees or more after departing the same or adjacent aerodromes by use of one of the following minima:

NOTE—

① *Consider known aircraft performance characteristics when applying initial separation to successive departing aircraft.*

② *When one or both of the departure surfaces is a helipad, use the takeoff track of the helicopter as a reference, comparable to the centerline of a runway and the helipad center as the threshold.*

a. When aircraft will fly diverging tracks:

1. Immediately after takeoff - 1 minute until tracks diverge. (See FIG 6-2-1).
2. Within 5 minutes after takeoff - 2 minutes until tracks diverge. (See FIG 6-2-2).

FIG 6-2-1 Minima on Diverging Tracks

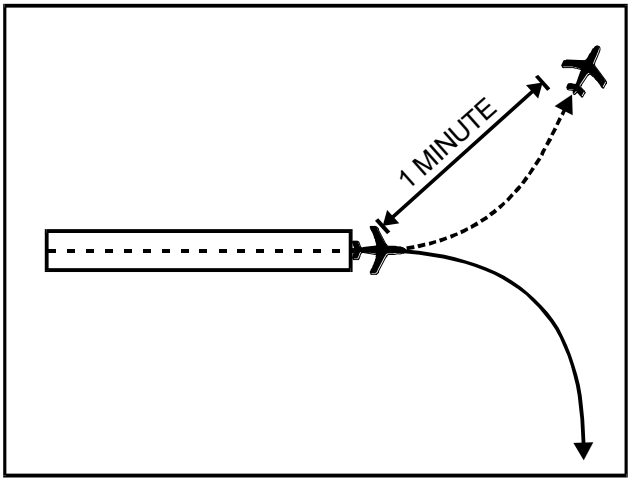
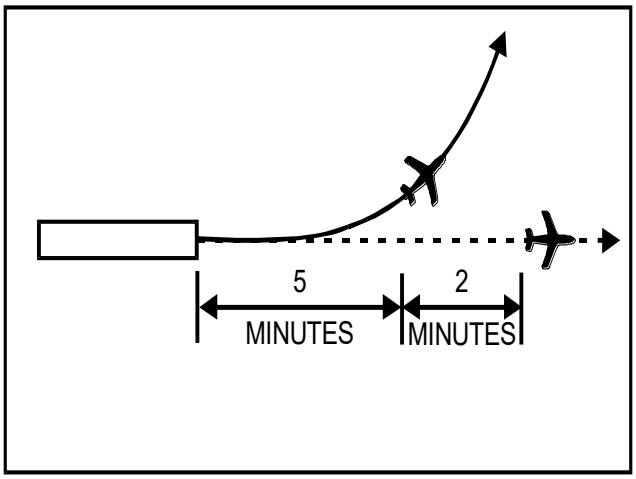


FIG 6-2-2 Minima on Diverging Tracks



3. Within 13 miles DME/ATD after takeoff - 3 miles until tracks diverge. (See FIG 6-2-3).

FIG 6-2-3 Minima on Diverging Tracks

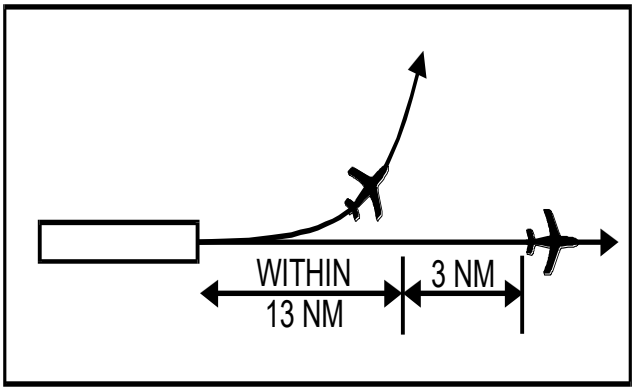
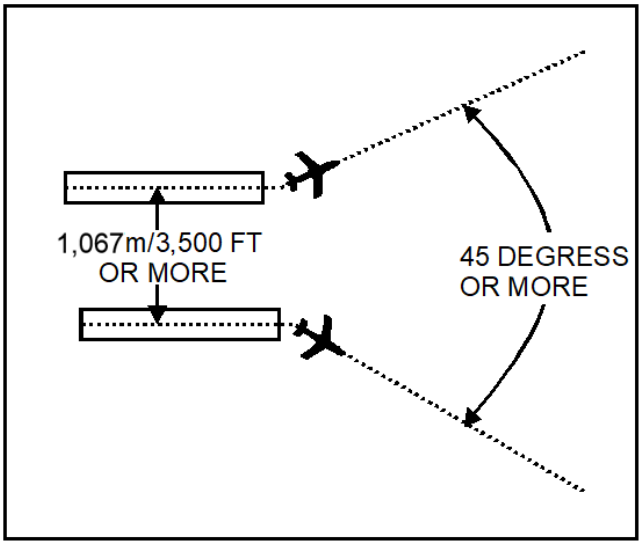


FIG 6-2-4 Minima on Diverging Tracks



b. *TERMINAL*: Between aircraft departing in the same direction from different runways whose centerlines

are parallel and separated by at least 1,067m/3,500 feet, authorize simultaneous takeoffs when the aircraft will fly diverging track immediately after takeoff. (See FIG 6-2-4).

c. TERMINAL: Between aircraft that will fly diverging track immediately after takeoff from diverging runways: (See FIG 6-2-5)

1. Nonintersecting runways: authorize simultaneous takeoffs when either of the following conditions exist:

(a) The runways diverge by 30 degrees or more.

(b) The distance between runway centerlines at and beyond the points where takeoffs begin is at least:

(1) 610m/2,000 feet and the runways diverge by 15 to 29 degrees inclusive.

(2) 1,067m/3,500 feet and the runways diverge by less than 15 degrees.

FIG 6-2-5 Minima on Diverging Tracks

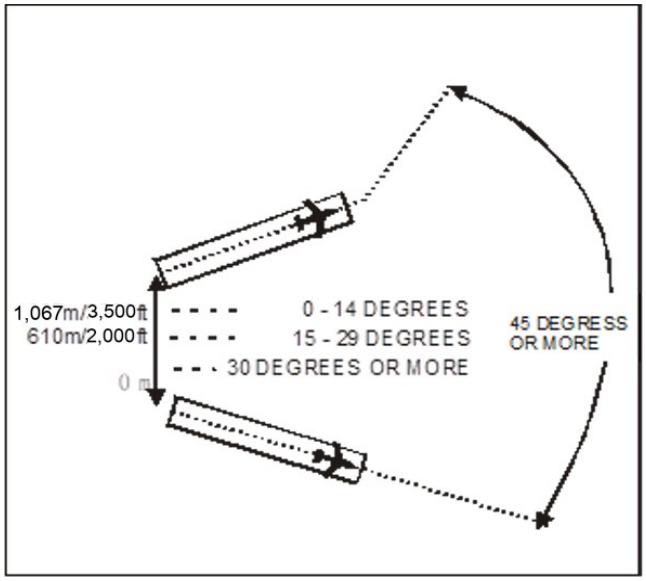
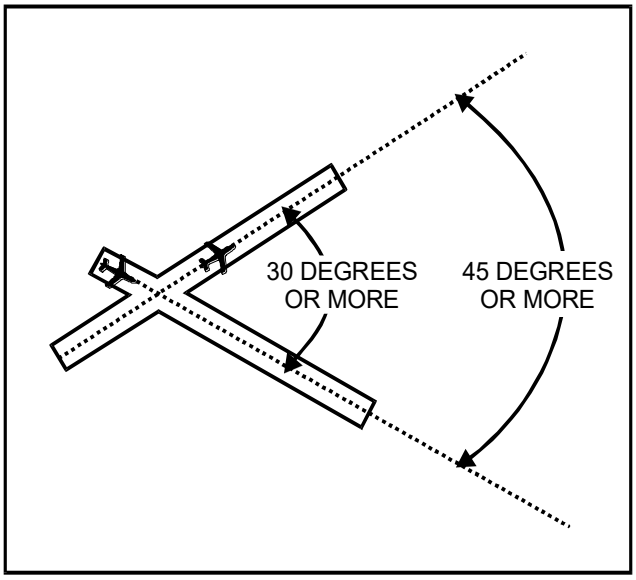


FIG 6-2-6 Minima on Diverging Tracks

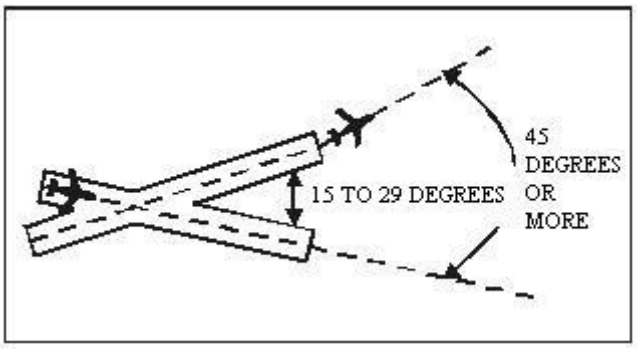


2. Intersecting runways: authorize takeoff of a succeeding aircraft when the preceding aircraft has passed the point of runway intersection, and

(a) The runways diverge by 30 degrees or more. (See FIG 6-2-6)

(b) The runways diverge by 15 to 29 degrees inclusive and the preceding aircraft has commenced a turn. (See FIG 6-2-7)

FIG 6-2-7 Minima on Diverging Tracks



6-2-2 MINIMA ON SAME TRACK

Separate aircraft that will fly the same track when the following aircraft will climb through the level assigned to the leading aircraft by using a minimum of 3 minutes until the following aircraft passes through the assigned level of the leading aircraft; or 5 miles between DME equipped aircraft; RNAV equipped aircraft using ATD; and between DME and ATD aircraft provided the DME aircraft is either 10,000 feet or below or outside of 10 miles from the DME NAVAID. (See FIG 6-2-8 and FIG 6-2-9).

FIG 6-2-8 Minima on Same Tracks

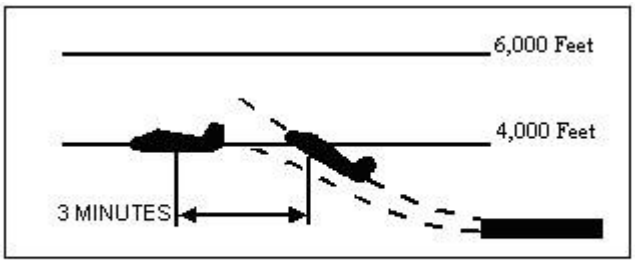
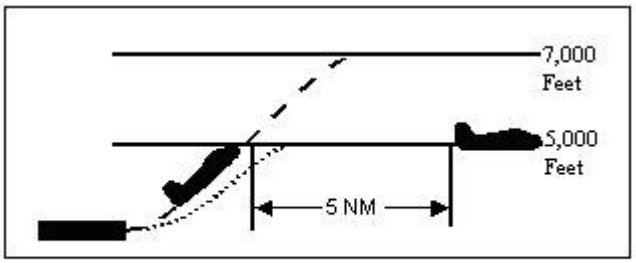


FIG 6-2-9 Minima on Same Tracks



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Section 3. INITIAL SEPARATION OF DEPARTING AND ARRIVING AIRCRAFT

6-3-1 SEPARATION MINIMA

Separate a departing aircraft from an arriving aircraft making an instrument approach to the same aerodrome by using one of the following minima until vertical or lateral separation is achieved:

a. *TERMINAL*: When takeoff direction differs by at least 45 degrees from the reciprocal of the final approach course, the departing aircraft takes off before the arriving aircraft leaves a fix inbound not less than 4 miles from the aerodrome.

b. *TERMINAL*: When takeoff direction is other than in subpara a., the departing aircraft takes off so that it is established on a track diverging by at least 45 degrees from the reciprocal of the final approach course before the arriving aircraft leaves a fix inbound not less than 4 miles from the aerodrome.

c. *TERMINAL*: When the absence of an appropriate fix precludes the application of subpara a. or b., and at aerodromes where approach control service is not provided, the separation in subpara d. or e. shall be applied.

d. When takeoff direction differs by at least 45 degrees from the reciprocal of the final approach course, the departing aircraft takes off 3 minutes before the arriving aircraft is estimated at the aerodrome. (See FIG 6-3-1).

e. When takeoff direction is other than in subpara d., the departing aircraft takes off so that it is established on a track diverging by at least 45 degrees from the reciprocal of the final approach course 5 minutes before the arriving aircraft is estimated at the aerodrome or before it starts procedure turn. (See FIG 6-3-2 and FIG 6-3-3).

FIG 6-3-1 Separation Minima

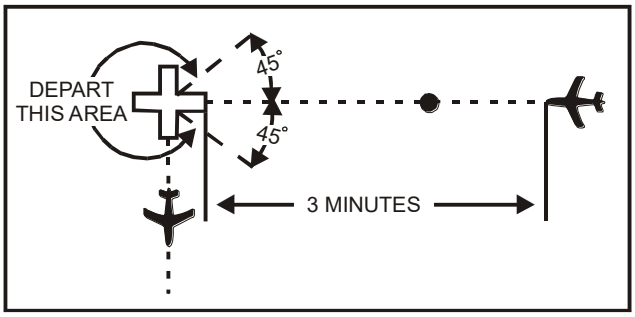


FIG 6-3-2 Separation Minima

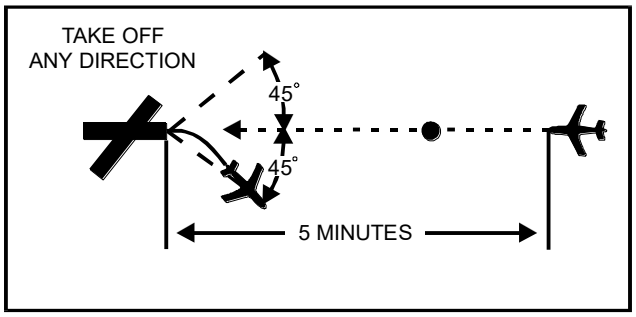
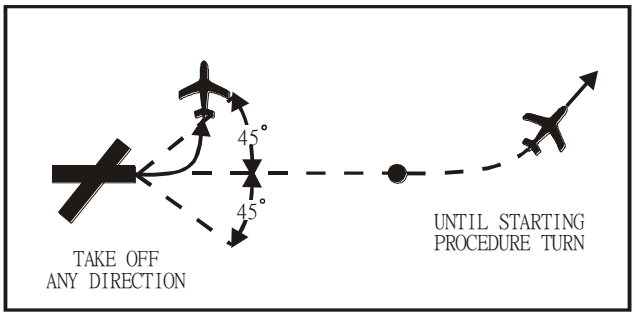


FIG 6-3-3 Separation Minima



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Section 4. LONGITUDINAL SEPARATION

6-4-1 APPLICATION

Separate aircraft longitudinally by requiring them to do one of the following, as appropriate:

a. Depart at a specified time.

b. Arrive at a fix at a specified time.

PHRASEOLOGY:

CROSS (significant point) AT (time) [OR LATER (or OR BEFORE)].

c. Hold at a fix until a specified time.

d. Change level at a specified time or fix.

REFERENCE—
LEVEL ASSIGNMENT, Para. 4-5-6.

6-4-2 MINIMA ON SAME, CONVERGING, OR CROSSING TRACKS

Separate aircraft on the same, converging, or crossing tracks by an interval expressed in time or distance, using the following minima:

a. When the leading aircraft maintains a speed at least 44 knots faster than the following aircraft - 5 miles between DME equipped aircraft; RNAV equipped aircraft using ATD; and between DME and ATD aircraft provided the DME aircraft is either 10,000 feet or below or outside of the 10 miles from the DME NAVAID, or 3 minutes between other aircraft if, in either case, one of the following conditions is met:

1. A departing aircraft follows a preceding aircraft which has taken off from the same or adjacent aerodrome. (See FIG 6-4-1).

FIG 6-4-1 Minima on Same Track
44 Knots or More Separation

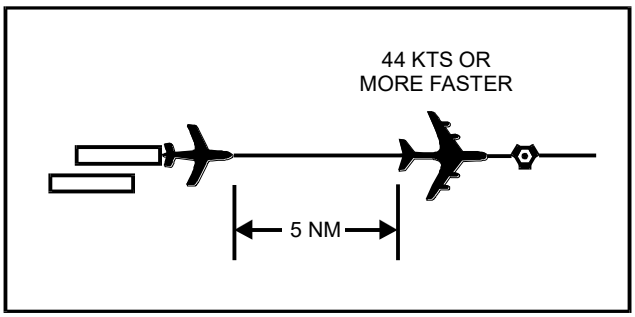
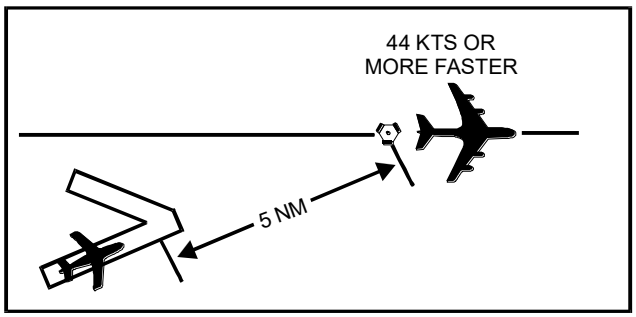


FIG 6-4-2 Minima on Converging Tracks
44 Knots or More Separation



2. A departing aircraft follows a preceding en route aircraft which has reported over a fix serving the departure aerodrome. (See FIG 6-4-2).

3. An en route aircraft follows a preceding en route aircraft which has reported over the same fix. (See FIG 6-4-3).

FIG 6-4-3 Minima on Crossing Tracks

44 Knots or More Separation

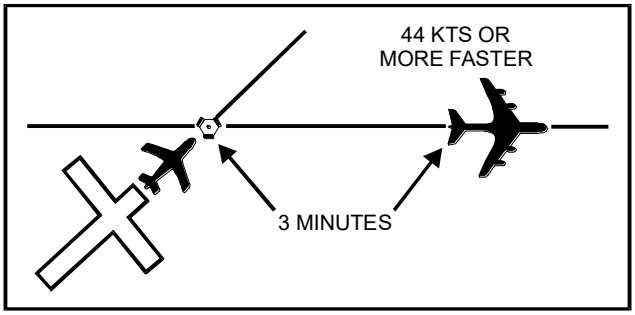
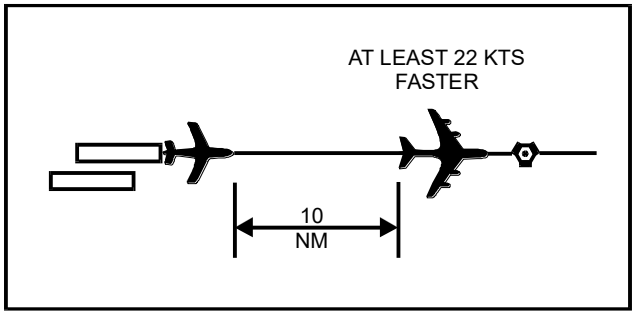


FIG 6-4-4 Minima on Same Track

22 Knots or More Separation



b. When the leading aircraft maintains a speed at least 22 knots faster than the following aircraft - 10 miles between DME equipped aircraft; RNAV equipped aircraft using ATD; and between DME and ATD aircraft provided the DME aircraft is either 10,000 feet or below or outside of 10 miles from the DME NAVAID; or 5 minutes between other aircraft if, in either case, one of the following conditions exists:

1. A departing aircraft follows a preceding aircraft which has taken off from the same or an adjacent aerodrome. (See FIG 6-4-4).
2. A departing aircraft follows a preceding en route aircraft which has reported over a fix serving the departure aerodrome. (See FIG 6-4-5).

FIG 6-4-5 Minima on Converging Tracks

22 Knots or More Separation

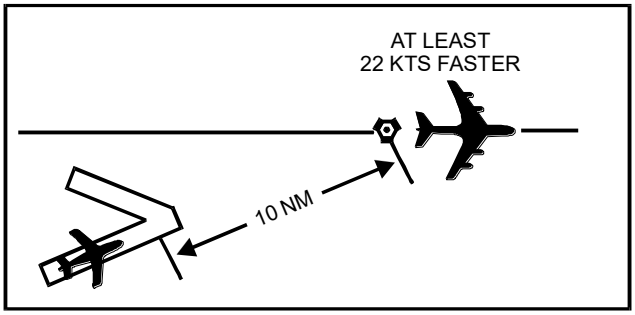
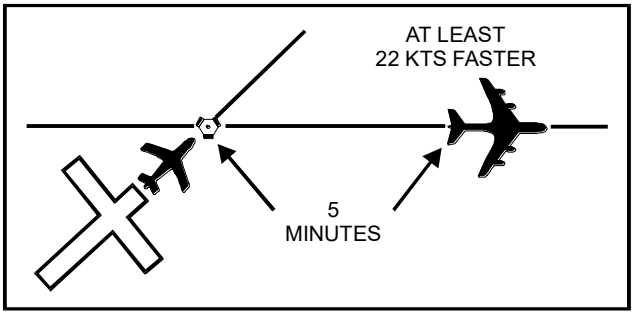


FIG 6-4-6 Minima on Crossing Tracks

22 Knots or More Separation



3. An en route aircraft follows a preceding en route aircraft which has reported over the same fix. (See FIG 6-4-6).

c. When an aircraft is climbing or descending through the level of another aircraft:

1. Between DME equipped aircraft; RNAV equipped aircraft using ATD; and between DME and ATD aircraft provided the DME aircraft is either 10,000 feet or below or outside of 10 miles from the DME NAVAID - 10 miles, if the descending aircraft is leading or the climbing aircraft is following. (See FIG 6-4-7 and FIG 6-4-8).

FIG 6-4-7 Descending Through another Aircraft's Level DME Separation

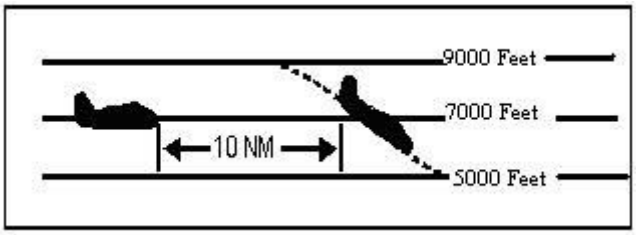
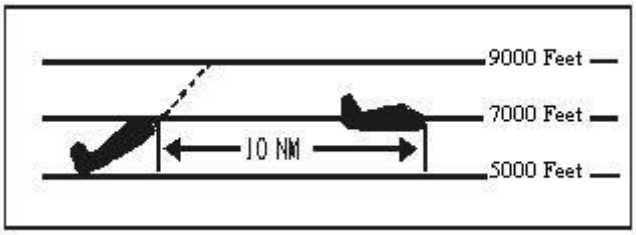


FIG 6-4-8 Climbing Through another Aircraft's Level DME Separation



2. Between other aircraft - 5 minutes, if all of the following conditions are met: (See FIG 6-4-9 and FIG 6-4-10).

FIG 6-4-9 Descending Through another Aircraft's Level Time Separation

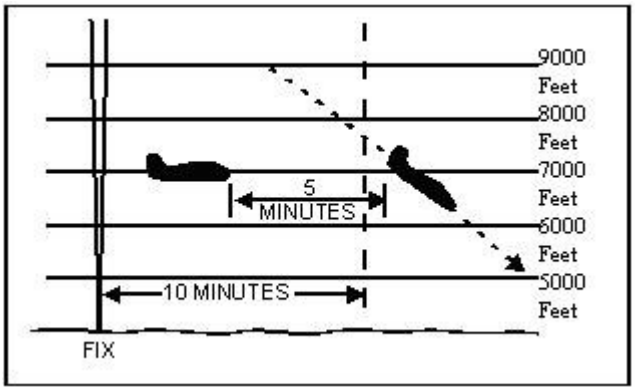
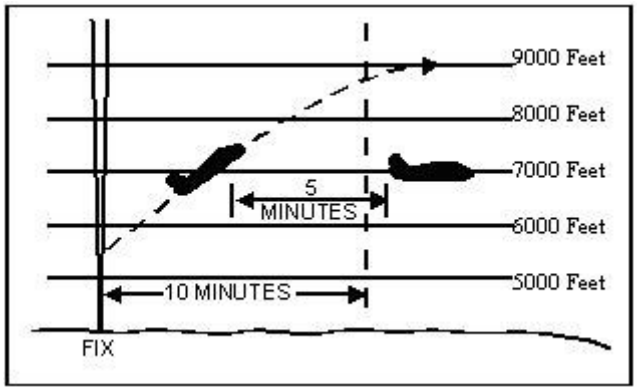


FIG 6-4-10 Climbing Through another Aircraft's Level Time Separation



(a) The descending aircraft is leading or climbing aircraft is following.

(b) The aircraft are separated by not more than 4,000 feet when the level change started.

(c) The change is started within 10 minutes after a following aircraft reports over a fix reported over by the leading aircraft or has acknowledged a clearance specifying the time to cross the same fix.

3. Between RNAV aircraft that are operating along an RNAV route that is 10 miles or less in width – 10 miles provided the following conditions are met:

(a) The descending aircraft is leading or the climbing aircraft is following.

(b) The aircraft were separated by not more than 4,000 feet when the level change started.

d. When the conditions of subparas a. b, or c cannot be met — 20 miles between DME equipped aircraft; RNAV equipped aircraft using ATD; and between DME and ATD aircraft provided the DME aircraft is either 10,000 feet or below or outside of 10 miles from the DME NAVAID; or 10 minutes between other aircraft. (See FIG 6-4-11, FIG 6-4-12, FIG 6-4-13, FIG 6-4-14, FIG 6-4-15, and FIG 6-4-16).

FIG 6-4-11

Minima for Same Track Separation

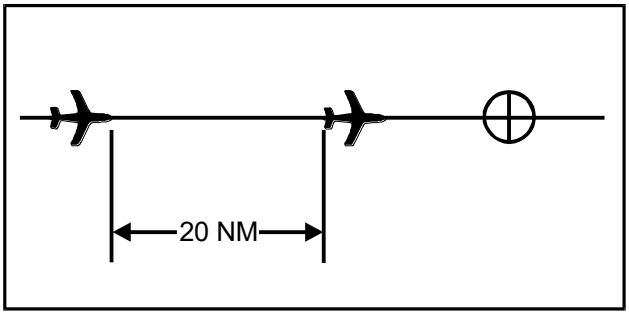


FIG 6-4-12

Minima for Crossing Tracks Separation

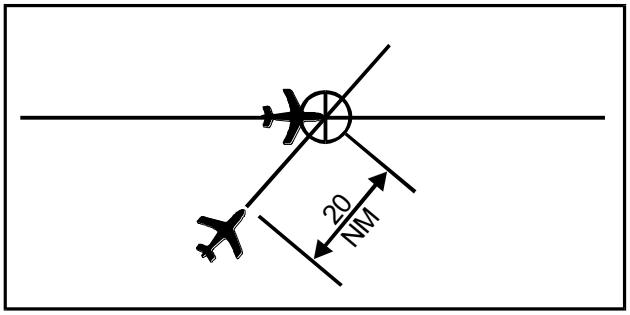


FIG 6-4-13

Minima for Same Track Separation

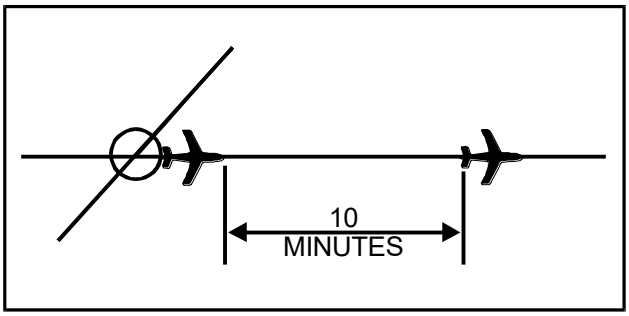


FIG 6-4-14

Minima for Crossing Tracks Separation

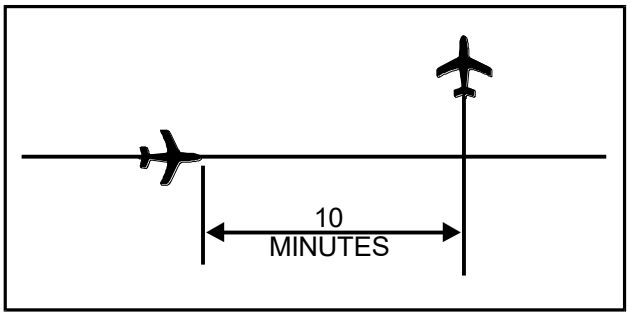


FIG 6-4-15 Climbing Through Another Aircraft's Level Separation

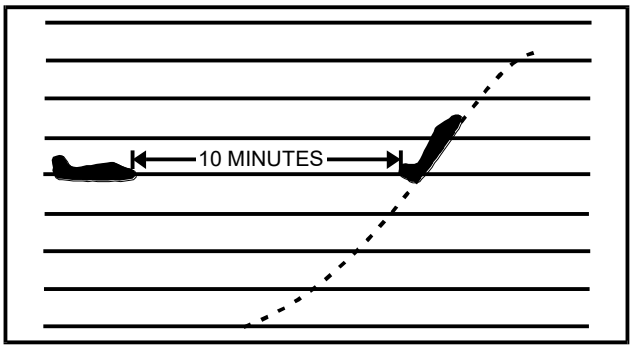
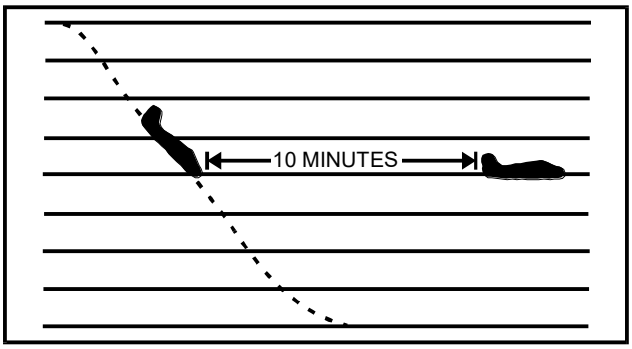


FIG 6-4-16 Descending Through Another Aircraft's Level Separation



e. Between aircraft, when one aircraft is using DME/ATD and the other is not – 30 miles if both the following conditions are met: (See FIG 6-4-17 and FIG 6-4-18)

FIG 6-4-17

Minima for Same Track Separation

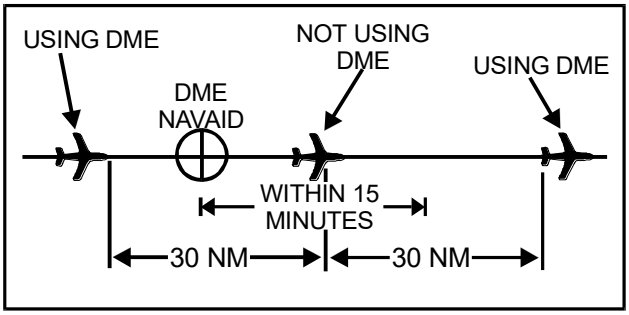
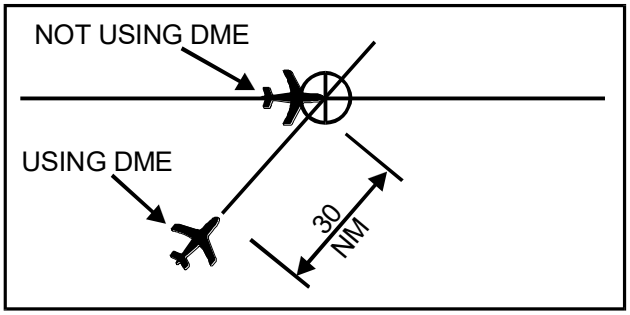


FIG 6-4-18

Minima for Crossing Tracks Separation



1. The aircraft using DME/ATD derives distance information by reference to the same NAVAID or waypoint over which the aircraft not using DME/ATD has reported.
2. The aircraft not using DME/ATD is within 15 minutes of the NAVAID.

6-4-3 MINIMA ON OPPOSITE TRACKS

Separate aircraft traveling opposite tracks by assigning different levels consistent with the approved vertical separation from 10 minutes before, until 10 minutes after they are estimated to pass. Vertical separation may be discontinued after one of the following conditions is met: (See FIG 6-4-19).

NOTE—
RNAV route segments that have been expanded in the proximity to reference facilities for slant-range effect are not to be considered "expanded" for purposes of applying separation criteria in this paragraph.

FIG 6-4-19

Minima for Opposite Tracks Separation

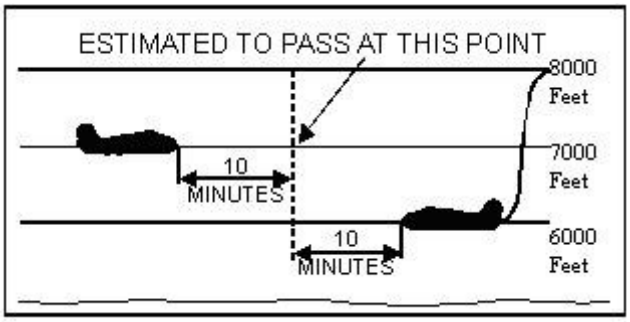
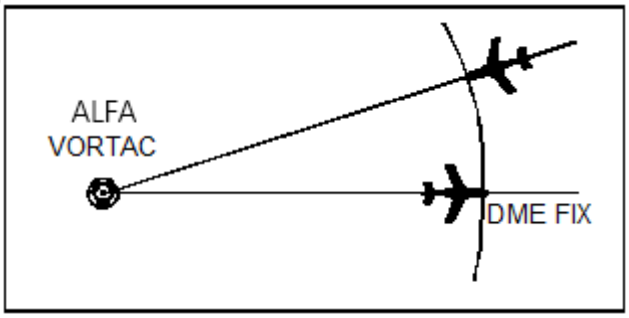


FIG 6-4-20

Minima for Opposite Tracks Separation



a. Both aircraft have reported passing NAVAIDs, DME fixes, or waypoints indicating they have passed each other. (See FIG 6-4-20).

   NOTE—
   It is not intended to limit application of this procedure only to aircraft operating in opposite directions along the same airway or radial. This procedure may also be applied to aircraft established on diverging airways or radials of the same NAVAID.

b. Both aircraft have reported passing the same intersection/waypoint and they are at least 3 minutes apart.

c. Two RNAV aircraft have reported passing the same position and are at least *10 miles* apart if operating along a route that is 10 miles or less in width; or *20 miles* apart if operating along any route segment that is greater than 10 miles in width; except that *30 miles* shall be applied if operating along that portion of any route segment defined by a navigation station requiring extended usable distance limitations beyond 130 miles.

d. An aircraft utilizing RNAV and an aircraft utilizing VOR have reported passing the same position and the RNAV aircraft is at least *5 miles* beyond the reported position when operating along a route that is 10 miles or less in width; *10 miles* beyond the point when operating along any route segment that is greater than 10 miles in width; except that *15 miles* shall be applied if operating along that portion of any route segment defined by a navigation station requiring extended usable distance limitation beyond 130 miles; or *3 minutes* apart whichever is greater.

6-4-4 RNAV AIRCRAFT ALONG VOR AIRWAYS/ROUTES

Advise the pilot to use DME distances when applying DME separation to an RNAV aircraft operating along VOR airways/routes.

PHRASEOLOGY-

USE DME DISTANCES.

NOTE—
Along Track Distance derived from area navigation devices having slant-range correction will not coincide with the direct DME readout.

Section 5. LATERAL SEPARATION

6-5-1 SEPARATION METHODS

Separate aircraft by one of the following methods:

a. Clear aircraft on different airways or routes whose widths or protected airspace do not overlap.

b. Clear aircraft at or below FL200 to proceed to and report over or hold at different geographical locations determined visually or by reference to NAVAIDs.

c. Clear aircraft to hold over different fixes whose holding pattern airspace areas do not overlap each other or other airspace to be protected.

d. Clear departing aircraft to fly specified headings which diverge by at least 45 degrees.

6-5-2 MINIMA ON DIVERGING RADIALS

a. Consider separation to exist between aircraft:

1. established on radials of the same NAVAID that diverge by at least 15 degrees when either aircraft is clear of the airspace to be protected for the other aircraft.

2. With non-VOR/DME based navigational equipment established on tracks of the same waypoint that diverge by at least 15 degrees when either aircraft is clear of the airspace to be protected for the other aircraft.

NOTE—
The procedure may be applied to converging as well as diverging aircraft. (See FIG 6-5-1) For example, the aircraft depicted 8-mile from the NAVAID/waypoint would require vertical separation until reaching the 8-miles point. Reversing direction, the same aircraft would require vertical separation before passing the 8-mile point. Due to the nature of GNSS equipment, issue crossing restrictions in reference to the next waypoint, since the pilot receives tracking "to" data rather than tracking "from" the last waypoint.

Minima on Diverging Radials

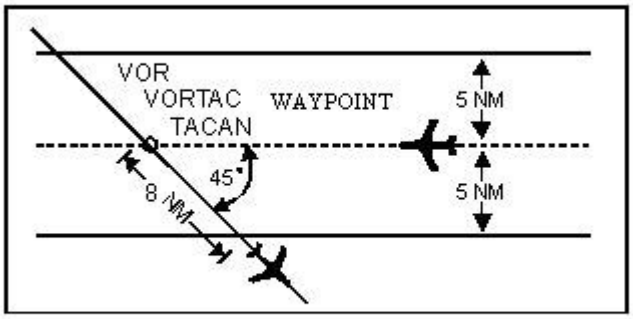


FIG 6-5-1

TBL 6-5-1

Non-DME Divergence Distance Minima

Divergence (Degrees)	Distance (NM)
15	20
20	15
25	12
30	10
35	9
45	8
55	7
90	5
NOTE— This table is for non-DME application only.	

TBL 6-5-2

Divergence Distance Minima

Divergence (Degrees)	Distance (NM)	
	at or below FL 200	above FL 200 through FL 450
15	21	22
20	16	17
25	13	15
30	11	13
35	10	13
45	9	13
55	8	13
90	7	13
This Table is for DME application and compensates for DME slant-range error.		

b. Use the TBL 6-5-1 and TBL 6-5-2 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.

NOTE—
For levels of 3,000 feet or less above the elevation of the NAVAID, DME slant-range error is negligible and the values in TBL 6-5-1 may be used.

6-5-3 DME ARC MINIMA

Apply lateral DME separation by requiring aircraft using DME to fly an arc about a NAVAID at a specified distance using the following minima: (See FIG 6-5-2).

FIG 6-5-2 DME Arc Minima

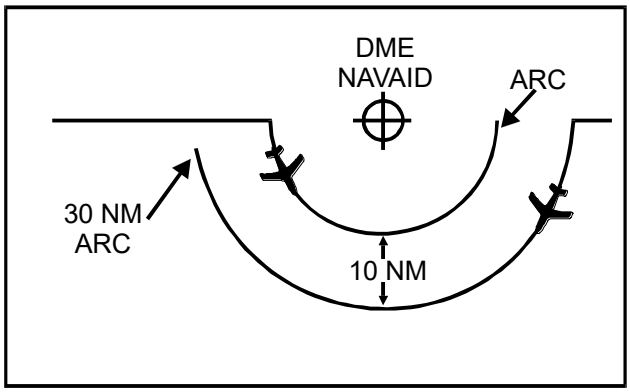
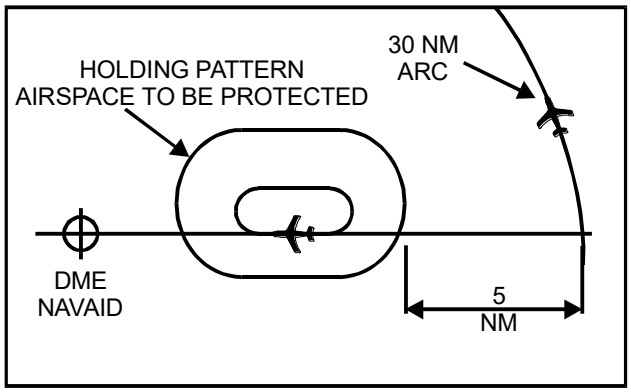


FIG 6-5-3 DME Arc Minima



REFERENCE—
NAVAID Terms, Para 2-5-2.

a. Between different arcs about a NAVAID regardless of direction of Flight:

1. At 35 miles or less from the NAVAID - 10 miles
2. More than 35 miles from the NAVAID - 20 miles.

b. Between an arc about a NAVAID and other airspace to be protected: (See FIG6-5-3).

NOTE—
The other airspace to be protected may be a MOA, holding pattern, airway or route, ATCAA, danger area, restricted area, prohibited area, etc.

1. At 35 miles or less from the NAVAID- 5 miles.
2. More than 35 miles from the NAVAID- 10 miles.

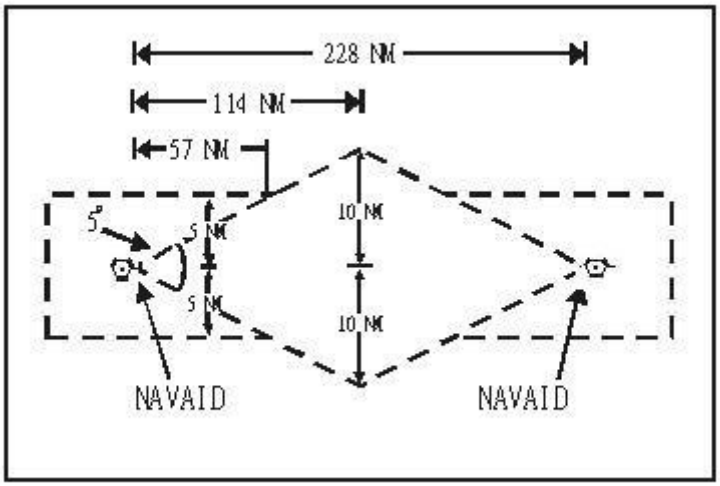
PHRASEOLOGY:

VIA (number of miles) MILE ARC (direction) OF (name of DME NAVAID).

6-5-4 MINIMA ALONG OTHER THAN ESTABLISHED AIRWAYS OR ROUTES

Protect airspace along other than established airways or routes as follows:(See FIG 6-5-4)

FIG 6-5-4 Minima Along Other Than Established Airways or Routes



a. Direct tracks and track changes of 15 degrees or less:

1. Via NAVAID's or radials FL 600 and below - 5 miles on each side of the route to a point 57 miles from the NAVAID, then increasing in width on a 5 degree angle to a width of 10 miles on each side of the route at a distance of 114 miles from the NAVAID.
2. Via degree-distance fixes for RNAV flights above FL 450 – 10 miles on each side of the route.

NOTE—
Degree-distance RNAV flight at FL 450 and below are provided radar separation.

b. When track change is 16 degrees through 90 degrees, protect the airspace on the overflown side beginning at the point where the track changes, as follows: (See FIG 6-5-5).

1. At or below FL200 - same as subpara a.1.
2. Above FL200 to FL 230 inclusive - 15 miles.
3. Above FL 230 to FL 600 inclusive - 18 miles.

c. When track change is 91 degrees through 180 degrees, protect the airspace on the overflown side beginning at the point where the track changes, as follows: (See FIG 6-5-6).

1. At or below FL200 - same as subpara a.1.
2. Above FL200 to FL 230 inclusive - 29 miles.
3. Above FL 230 to FL 600 inclusive - 35 miles.

d. After the track changes specified in subpara b. or c. have been completed and the aircraft is back on track, the appropriate minima in subpara a. may be used.

FIG 6-5-5 Overflown Side Minima 16 to 90 Degrees

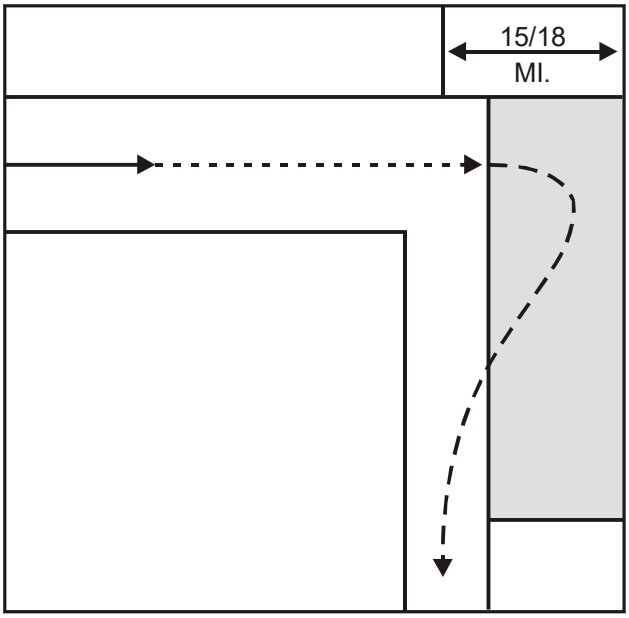
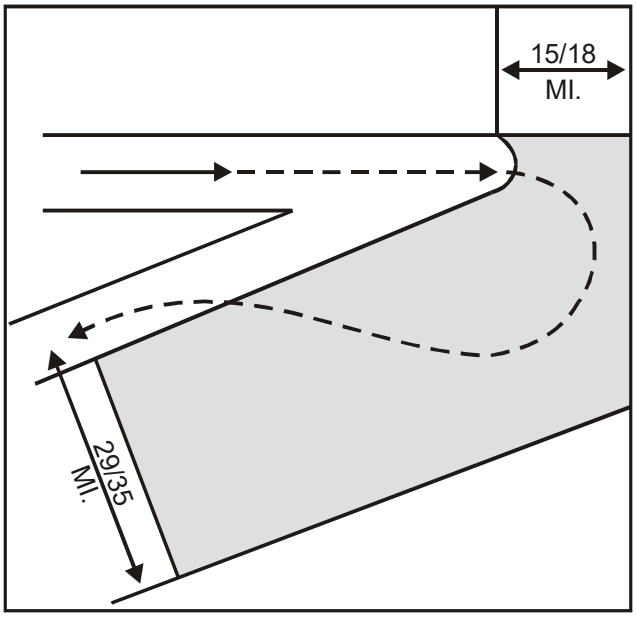


FIG 6-5-6 Overflown Side Minima 91 to 180 Degrees



6-5-5 RNAV MINIMA- DIVERGING/CROSSING TRACKS

Consider lateral separation to exist when an RNAV aircraft is beyond the point where the lateral protected airspace of that aircraft has ceased to overlap the lateral protected airspace of another by at least:

a. When operating along a route that is 10 miles or less in width- *5 miles.*

b. When operating along any route segment that is greater than 10 miles in width- *10 miles,* except that *15 miles* shall be applied along that portion of any route segment requiring extended usable distance limitation beyond 114 miles of the reference facility.

Section 6. VERTICAL SEPARATION

6-6-1 APPLICATION

Assign a level to an aircraft after the aircraft previously at that level has reported leaving the level.

PHRASEOLOGY:

REPORT LEAVING/REACHING (level).

REPORT LEAVING ODD/EVEN LEVELS/ FLIGHT LEVELS.

REPORT LEVEL.

REFERENCE—
PROCEDURAL PREFERENCE, Para 2-1-4.

VERTICAL SEPARATION MINIMA, Para 4-5-1.

Separation, Para 7-6-3

6-6-2 EXCEPTIONS

Assign a level to an aircraft only after the aircraft previously at that level has reported at or passing through another level separated from the first by the appropriate minimum when:

a. Severe turbulence is reported.

b. Aircraft are conducting military aerial refueling.

c. The aircraft previously at the level has been:

   1. Issued a clearance permitting pilot to climb or descent when ready.

   2. Cleared to CRUISE (level). However, do not use Mode C to effect separation with an aircraft on a cruise clearance.

   NOTE—
   An aircraft assigned a CRUISE clearance is assigned a block of airspace from the minimum IFR altitude up to and including the assigned cruising level and climb/descent within the block is at pilot's discretion. When the pilot verbally reports leaving a level in descent he may not return to that level.

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Section 7. TIMED APPROACHES

6-7-1 APPLICATION

Timed approaches using either nonradar procedures or radar vectors to the final approach course may be used at aerodromes served by a tower if the following conditions are met:

NOTE—
These procedures require NAVAIDs and standard/special instrument approach procedures or adequate radar coverage which permit an aircraft to:

① *Hold at a fix located on the approach course or to be radar vectored to the final approach course for a straight-in approach in accordance with the minima specified in para 6-7-5, INTERVAL MINIMA.*

② *Proceed in the direction of the aerodrome along the approach course crossing the holding/approach fix at a specified level if required.*

③ *Continue descent for an approach to destination aerodrome.*

a. Direct communication is maintained with the aircraft until the pilot is instructed to contact the tower.

b. If more than one missed approach procedure is available, none require course reversal.

c. If only one missed approach procedure is available, the following conditions are met:

1. course reversal is not required.

2. Reported ceiling and visibility are equal to or greater than the highest prescribed circling minimums for the instrument approach procedure in use.

NOTE—
Determination of whether or not an existing ceiling meets minima is accomplished by comparing MDA (MSL) with ceiling (AGL) plus the aerodrome elevation.

REFERENCE—
APPROACH SEQUENCE, Para 6-7-2.

6-7-2 APPROACH SEQUENCE

When an aircraft passes the final approach fix inbound (non-precision approach) or the outer marker or fix used in lieu of the outer marker inbound (precision approach), issue clearances for a succeeding timed approach in accordance with the following:

REFERENCE—
APPROACH SEPARATION RESPONSIBILITY, Para 5-9-5

LEVEL FLIGHT RESTRICTION, Para 6-7-4.

MISSED APPROACHES, Para 6-7-7.

a. Clear the succeeding aircraft for approach, to descend to the level vacated by the preceding aircraft, and to leave the final approach fix inbound (non-precision approach) or the outer marker or the fix used in lieu of the outer marker inbound (precision approach) at a specified time; or when using radar to sequence and position aircraft on the final approach course, vector aircraft to cross the final approach fix/outer marker or the fix used in lieu of the outer marker in compliance with para 6-7-5, INTERVAL MINIMA.

NOTE—
FIG 6-7-1 depicts the application of timed approach procedures using an ILS and applying longitudinal separation only. Using an interval of 2 minutes between successive approaches, the #1 and #2 aircraft have already passed the outer locator (LOM) on final approach and the #3 aircraft has been cleared for approach and to depart the LOM 2 minutes after the #2 aircraft reported leaving the LOM inbound on final approach. After aircraft in the approach sequence depart the holding/approach fix (LOM) inbound, vertical separation is no longer provided and longitudinal separation is utilized.

REFERENCE—
FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

b. If an alternative missed approach procedure is not available and weather conditions are less than required by para 6-7-1, APPLICATION, subpara c., clear the succeeding aircraft for an approach when the preceding aircraft has landed or canceled its IFR flight plan.

NOTE—
FIG 6-7-2 depicts the application of timed approach procedures using a holding/approach fix on a bearing of an NDB and applying a combination of longitudinal and vertical separation. The #3 aircraft has been instructed to descend to 2,000 after the #2 aircraft has reported departing the holding/approach fix inbound and leaving 2,000 at Point A. The #2 aircraft has departed the holding/approach fix inbound at the designated time, maintaining 2,000 until cleared for approach at Point A. The #1 aircraft has been sighted, enabling the controller to issue approach clearance to the #2 aircraft at Point A.

c. Release the aircraft to the tower before it reaches the final approach fix.

FIG 6-7-1 Timed Approach Procedures Using ILS and Longitudinal Separation Only

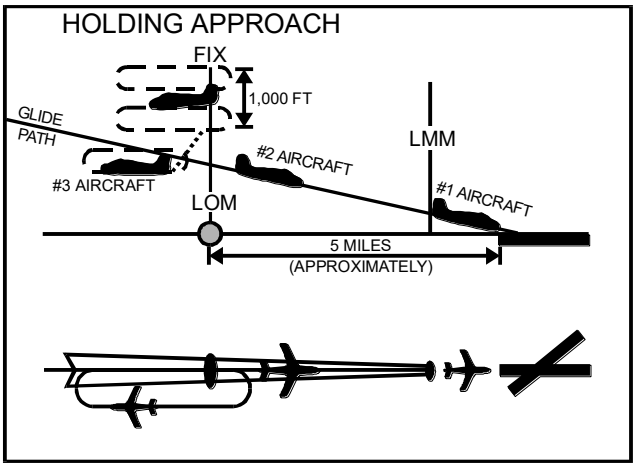
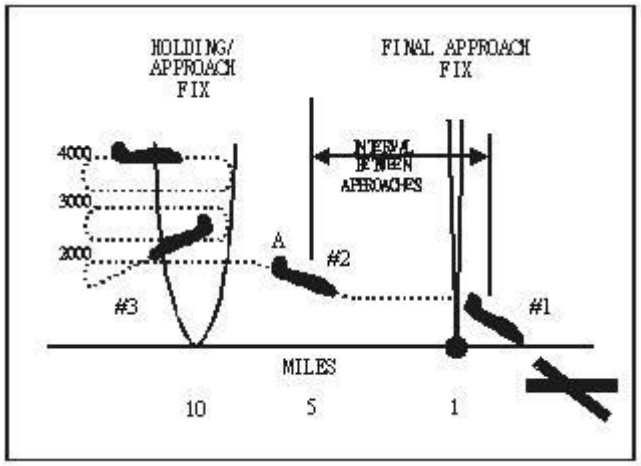


FIG 6-7-2 Timed Approach Procedures Using a Bearing on an NDB and Longitudinal and Vertical Separation



6-7-3 SEQUENCE INTERRUPTION

Interrupt the established timed approach sequence if necessary to allow an aircraft to execute a different type of approach.

6-7-4 LEVEL FLIGHT RESTRICTION

If the weather report indicates an aircraft will be in IFR conditions over the final approach fix (non-precision approach) or the outer marker or fix used in lieu of the outer marker (precision approach) when para 6-7-2, APPROACH SEQUENCE, subpara b. is applied, clear the second aircraft for an approach early enough to allow at least 1 minute of level flight before crossing the final approach fix/outer marker or the fix used in lieu of the outer marker.

6-7-5 INTERVAL MINIMA

Use a 2-minute or a 5-mile radar interval (except when wake turbulence separation is required) as the minimum between successive approaches and increase the interval, as necessary, taking into account the:

NOTE—
Increased separation is required for LIGHT aircraft behind HEAVY aircraft because of the possible effects of wake turbulence.

REFERENCE—
APPROACH SEPARATION RESPONSIBILITY, Para 5-9-5.
APPLICATION, Para 6-7-1
APPROACH SEQUENCE, Para 6-7-2.

a. Relative speeds of aircraft concerned.

b. Existing weather conditions.

c. Distance between approach fix and aerodrome.

d. Type of approach being made.

6-7-6 TIME CHECK

Issue a time check to an aircraft before specifying a time to leave the approach fix inbound unless the aircraft is vectored to the final approach course.

6-7-7 MISSED APPROACHES

a. If weather conditions are such that an aircraft will likely miss an approach, issue an alternative missed approach procedure to the next aircraft.

b. If an aircraft misses an approach, allow the next aircraft to continue the approach if it has been assigned an alternative missed approach procedure. Retain radar control or hold any remaining aircraft at assigned levels until traffic conditions permit the issuance of approach clearance.

c. When para 6-7-2, APPROACH SEQUENCE, subpara b. is applied and the first aircraft missed an approach, retain radar control or clear the second aircraft to maintain the last assigned level (minimum holding altitude) and return to the holding/approach fix to hold until traffic conditions permit the issuance of approach clearances.

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Chapter 7. VISUAL

Section 1. GENERAL

7-1-1 AIRSPACE RESTRICTIONS

Do not apply visual separation or issue VFR clearances in Class A airspace.

Note—

"Rules of the Air" article 58: Unless authorized by the appropriate ATS authority, VFR flights shall not be operated:

a) above FL 200;

b) at transonic and supersonic speeds.

7-1-2 IFR – VFR WEATHER ADVICE

When an ATS unit is in possession of information that instrument meteorological conditions are likely to be encountered along the route of flight, a pilot changing from IFR flight to VFR flight should, if practicable, be so advised.

PHRASEOLOGY—

"INSTRUMENT METEOROLOGICAL CONDITIONS REPORTED (or forecast) IN THE VICINITY OF (location)".

7-1-3 MAINTAINING VMC ON IFR FLIGHT PLAN

a. By day only, you may clear aircraft to "Maintain VMC" in accordance with the following:

1. The pilot of an aircraft on an IFR flight plan requests climb/descent in VMC.

NOTE—
The clearance shall be for a specified portion of the flight at or below10 000 ft, during climb or descent.

2. The pilot of an aircraft not on an IFR flight plan requests a practice instrument approach.

PHRASEOLOGY:

MAINTAIN VMC

MAINTAIN VMC UNTIL (time or fix)

MAINTAIN VMC ABOVE/BELOW (level)

MAINTAIN OWN SEPARATION AND VMC[FROM (level)][TO (level)]

and if required,

MAINTAIN OWN SEPARATION AND VMC ABOVE (or BELOW, or, TO)(level)

b. If you are in possession of information that IMC may be encountered, issue an alternative clearance that will ensure separation from all other aircraft for which you have separation responsibilities.

PHRASEOLOGY—

IF UNABLE, (alternative procedure), AND ADVISE.

REFERENCE—
GENERAL PROVISION OF SEPARATION, Para 2-1-3.

7-1-4 APPROACH CONTROL SERVICE FOR VFR ARRIVING AIRCRAFT

Prior to entering the traffic circuit or commencing its approach to land, an aircraft shall be provided with the following elements of information, in the order listed, with the exception of such elements which it is known the aircraft has already received:

a. The runway to be used;

b. The surface wind direction and velocity, including significant variations therefrom;

c. The QNH altimeter setting and, either on a regular basis in accordance with local arrangements or, if so requested by the aircraft, the QFE altimeter setting.

REFERENCE—

APPLICATION, Para 7-5-1.

SERVICE AVAILABILITY, Para 7-5-2.

7-1-5 VISUAL HOLDING OF VFR AIRCRAFT

TERMINAL

When it becomes necessary to hold VFR aircraft at visual holding locations, take the following actions:

a. Clear aircraft to hold at selected, prominent geographical fixes which can be easily recognized from the air.

PHRASEOLOGY:

HOLD VISUAL [OVER] (position), (or BETWEEN (two prominent landmarks));

REFERENCE—

VISUAL HOLDING LOCATIONS, Para 4-6-5.

b. Issue traffic information to aircraft cleared to hold at the same fix.

PHRASEOLOGY:

HOLD AT (location) UNTIL (time or other condition), TRAFFIC (description) HOLDING AT (fix, level if known),

or

PROCEEDING TO (fix) FROM (direction or fix).

7-1-6 SUSPENSION OF VFR OPERATIONS

a. Any or all VFR operations on and in the vicinity of an aerodrome may be suspended by any of the following units, persons or authorities whenever safety requires such action:

1. The approach control unit or the appropriate ACC;
2. The aerodrome control tower;
3. The appropriate ATS authority.

b. All such suspensions of VFR operations shall be accomplished through or notified to the aerodrome control tower.

c. The following procedures shall be observed by the aerodrome control tower whenever VFR operations are suspended:

1. Hold all VFR departures.
2. Recall all local flights operating under VFR or obtain approval for special VFR operations.
3. Notify other ATC units as appropriate of the action taken.
4. If necessary or requested, notify all affected operators, or their designated representatives, of the

reason for taking such action.

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Section 2. VISUAL SEPARATION

7-2-1 VISUAL SEPARATION

Visual separation may be applied when other approved separation is assured before and after the application of visual separation. To ensure that other separation will exist, consider aircraft performance, wake turbulence, closure rate, routes of flight, known weather conditions, and aircraft position. Weather conditions must allow the aircraft to remain within sight until other separation exists.

REFERENCE—

WAKE TURBULENCE CAUTION, Para 2-1-21.

TRAFFIC INFORMATION, Para 2-1-22.

USE OF TOWER SURVEILLANCE RADAR DISPLAYS, Para 3-1-9.

APPROACH SEPARATION RESPONSIBILITY, Para 5-9-5.

VISUAL APPROACH, Para 7-3-1.

VECTORS FOR VISUAL APPROACH, Para 7-3-2.

a. TERMINAL: Visual separation may be applied between aircraft up to FL200 under the following conditions:

1. Tower-applied visual separation:

(a) Maintain communication with at least one of the aircraft involved.

(b) The tower visually observes the aircraft, issues timely traffic advisories, and provides visual separation between the aircraft.

(c) Issue control instructions as necessary to ensure continued separation between the applicable aircraft.

(d) Do not apply visual separation between successive departures when departure routes and/or aircraft performance preclude maintaining separation.

(e) The use of tower-applied visual separation is not authorized when wake turbulence separation is required.

(f) Adjacent aerodromes with operating control towers are not authorized to apply visual separation between their traffic and the other control tower's traffic.

2. Pilot-applied visual separation:

(a) Maintain communication with at least one of the aircraft involved and ensure there is an ability to communicate with the other aircraft.

(b) The pilot sees another aircraft and is instructed to maintain visual separation from the aircraft as follows:

(1) Tell the pilot about the other aircraft. Including position, direction, type and, unless it is obvious, the other aircraft's intention.

(2) Obtain acknowledgment from the pilot that the other aircraft is in sight.

(3) Instruct the pilot to maintain visual separation from that aircraft.

PHRASEOLOGY：

TRAFFIC, (clock position and distance), (direction) BOUND, (type of aircraft), (intentions and other relevant information).

If required,

REPORT TRAFFIC IN SIGHT or DO YOU HAVE IT IN SIGHT?

If the answer is in the affirmative,

MAINTAIN VISUAL SEPARATION.

NOTE—
Towers must use the procedures contained in Paragraph 3-1-6, Traffic Information, subpara c or d, as appropriate.

(c) If the pilot reports the traffic in sight and will maintain visual separation from it (the pilot must state both), the controller may "approve" the operation instead of restating the instructions.

PHRASEOLOGY：
APPROVED.

NOTE—
Pilot-applied visual separation between aircraft is achieved when the controller has instructed the pilot to maintain visual separation and the pilot acknowledges with their call sign or when the controller has approved pilot-initiated visual separation.

(d) If aircraft are on converging courses, inform the other aircraft of the traffic and that visual separation is being applied.

PHRASEOLOGY：
TRAFFIC, (clock position and distance), (direction) BOUND, (type of aircraft), HAS YOU IN SIGHT AND WILL MAINTAIN VISUAL SEPARATION.

(e) Advise the pilots if the targets appear likely to merge.

NOTE—
Issue this advisory in conjunction with the instruction to maintain visual separation, the advisory to the other aircraft of the converging course, or thereafter if the controller subsequently becomes aware that the targets are merging.

(f) Control of aircraft maintaining visual separation may be transferred to an adjacent position/sector/unit. Coordination procedures must be specified in an LOA or facility directive

b. Control towers may be authorized to provide visual separation between aircraft within surface areas or designated areas provided other separation is assured before and after the application of visual separation. The control tower must apply the procedures contained in subparagraph a1 or a2, when applying visual separation.

PHRASEOLOGY：
VISUAL SEPARATION APPROVED BETWEEN (identification) AND (identification), and for departing aircraft, (departing/succeeding aircraft) (identification) RELEASED YOUR DISCRETION.

NOTE—
A control tower by accepting authorization for visual separation becomes responsible for ensuring that separation. Separation of IFR aircraft before and after application of visual separation is an IFR control function that must be applied by the Approach/Departure unit.

Section 3. APPROACHES

7-3-1 VISUAL APPROACH

A visual approach is an ATC authorization for an aircraft on an IFR flight plan to proceed visually and clear of clouds to the aerodrome of intended landing. A visual approach is not a standard instrument approach procedure and has no missed approach segment. An aircraft unable to complete a landing from a visual approach must be handled as any go−around and appropriate IFR separation must be provided until the aircraft lands or the pilot cancels their IFR flight plan.

a. At aerodromes with an operating control tower, aircraft executing a go−around may be directed to:

1. Enter the traffic circuit for landing. An altitude assignment is not required. The pilot is expected to climb to circuit altitude and is responsible to maintain terrain and obstruction avoidance. ATC must provide approved separation or visual separation from other IFR aircraft, or
2. Proceed as otherwise instructed by ATC. The pilot is expected to comply with assigned instructions, and responsible to maintain terrain and obstruction avoidance until reaching an ATC assigned altitude. ATC is responsible to provide instructions to the pilot to facilitate a climb to the minimum altitude for instrument operations. ATC must provide approved separation or visual separation from other IFR aircraft.

NOTE—

The pilot is responsible for their own terrain and obstruction avoidance during a go−around after conducting a visual approach. The facility can assign headings towards the lowest terrain and obstructions.

b. At aerodromes without an operating control tower, aircraft executing a go−around are expected to complete a landing as soon as possible or contact ATC for further clearance. ATC must maintain approved separation from other IFR aircraft.

REFERENCE—

GENERAL PRIORITIES 2-1-5.

SPECIFIC PRIORITIES 2-1-6.

WAKE TURBULENCE 2-1-20.

VISUAL SEPARATION 7-2-1.

APPROACHES TO MULTIPLE RUNWAYS 7−3−4.

PILOT/CONTROLLER GLOSSARY, GO AROUND.

7-3-2 VECTORS FOR VISUAL APPROACH

A vector for a visual approach may be initiated if the reported ceiling at the aerodrome of intended landing is at least 500 feet above the MVA/MIA and the visibility is 5KM or greater. At aerodromes without weather reporting service there must be reasonable assurance (e.g. area weather reports, PIREPs, etc.) that descent and flight to the aerodrome can be made visually, and the pilot must be informed that weather information is not available.

PHRASEOLOGY−

(Call sign) FLY HEADING

or

TURN RIGHT/LEFT HEADING (degrees) VECTOR FOR VISUAL APPROACH TO (aerodrome name). REPORT aerodrome (or RUNWAY) IN SIGHT.

(If appropriate)

WEATHER NOT AVAILABLE.

NOTE—

At aerodromes where weather information is not available, a pilot request for a visual approach indicates that descent and flight to the aerodrome can be made visually and clear of clouds.

REFERENCE—

VECTORS TO FINAL APPROACH COURSE, Para 5-9-1.

VISUAL SEPARATION, Para 7-2-1.

CLEARANCE FOR VISUAL APPROACH, Para 7−3−3.

APPROACHES TO MULTIPLE RUNWAYS, Para 7−3−4.

7−3−3 CLEARANCE FOR VISUAL APPROACH

Approach controls may clear aircraft for visual approaches using the following procedures:

a. Controllers may initiate, or pilots may request, a visual approach even when an aircraft is being vectored for an instrument approach and the pilot subsequently reports:

1. The aerodrome or the runway in sight at aerodromes with operating control towers.
2. The aerodrome in sight at aerodromes without a control tower.

NOTE—

If controllers initiate the visual approach, the concurrence of the flight crew shall be required.

b. During the nighttime,

1. when the pilot is familiar with the destination aerodrome and the surrounding environment, and can maintain visual reference with the terrain and obstacles continuously, the pilot can request a visual approach from the controller.
2. controller shall issue the instrument approach procedures preferentially and shall not initiate a visual approach.

NOTE—

The limitation of visual approach operations at night is not applicable to military.

c. Controllers shall exercise caution in initiating a visual approach when there is reason to believe that the flight crew concerned is not familiar with the aerodrome and its surrounding terrain. Controllers should also take into consideration the prevailing traffic and meteorological conditions when initiating visual approaches.

d. Resolve potential conflicts with all other aircraft, advise the faster succeeding aircraft of the distance to the slower preceding aircraft and speed difference, and ensure that weather conditions at the aerodrome are VFR or that the pilot has been informed that weather is not available for the destination aerodrome.

REFERENCE—

VISUAL SEPARATION, Para 7-2-1.

e. Clear an aircraft for a visual approach when:

1. The aircraft is number one in the approach sequence, or
2. At locations with an operating control tower, the aircraft is to follow a preceding aircraft and the pilot reports the preceding aircraft in sight and is instructed to follow it to the same runway, or

NOTE—

The pilot need not report the aerodrome/runway in sight.

3. At locations with an operating control tower, the pilot reports the aerodrome or runway in sight but not the preceding aircraft. Radar separation must be maintained until visual separation is provided.
4. At locations without an operating control tower or where part−time towers are closed, do not specify a runway when issuing a visual approach clearance, issue a visual approach clearance to the aerodrome only.

PHRASEOLOGY−

(at locations with an operating control tower)

(Call sign) (control instructions as required) CLEARED VISUAL APPROACH RUNWAY (number);

or

(at locations without an operating control tower)

(Call sign) (control instructions as required) CLEARED VISUAL APPROACH TO (aerodrome name)

(and if appropriate)

WEATHER NOT AVAILABLE

or

VERIFY/CONFIRM THAT YOU HAVE THE (aerodrome) WEATHER.

REFERENCE—

VISUAL SEPARATION, Para 7-2-1.

f. When both aircraft are of a HEAVY wake turbulence category, or the preceding aircraft is of a heavier wake turbulence category than the following, and the distance between the aircraft is less than the appropriate wake turbulence minimum, the controller shall issue a caution of possible wake turbulence. The pilot-in-command of the aircraft concerned shall be responsible for ensuring that the spacing from a preceding aircraft of a heavier wake turbulence category is acceptable. If it is determined that additional spacing is required, the flight crew shall inform the ATC unit accordingly, stating their requirements.

EXAMPLE−

"Dynasty One Zero One, following a Boeing Seven Eighty-seven, 12 o'clock, six miles, caution wake turbulence."

NOTE—

Visual separation is not authorized when the lead aircraft is a super.

REFERENCE—

VISUAL SEPARATION, Para 7-2-1.

g. Inform the tower of the aircraft's position prior to communications transfer at controlled aerodromes.

h. In addition to the requirements of paragraph 7−3−2, Vectors for Visual Approach, and subparagraphs a, b, c, d, e, f and g, ensure that the location of the destination aerodrome is provided when the pilot is asked to report the destination aerodrome in sight.

i. In those instances where aerodromes are located in close proximity, also provide the location of the aerodrome that may cause the confusion.

EXAMPLE-

"Delta Six One Two, Zhihang Aerodrome is at 2 o'clock, 5 miles. Fongnian Aerodrome is at 1 o'clock 6 miles. Report Fongnian in sight."

REFERENCE—

APPROACHES TO MULTIPLE RUNWAYS, Para 7−3−4.

7−3−4 APPROACHES TO MULTIPLE RUNWAYS

a. All aircraft must be informed that approaches are being conducted to parallel, intersecting, or converging runways. This may be accomplished through use of the ATIS.

b. When conducting visual approaches to multiple runways and the flight paths intersect, ensure approved separation is maintained until visual separation is applied.

c. The following conditions apply to visual approaches being conducted simultaneously to parallel,

intersecting, and converging runways, as appropriate:

1. Parallel runways separated by less than 2,500 feet. Unless approved separation is provided, an aircraft must report sighting a preceding aircraft making an approach (instrument or visual) to the adjacent parallel runway. When an aircraft reports another aircraft in sight on the adjacent extended runway centerline and visual separation is applied, controllers must advise the succeeding aircraft to maintain visual separation. Do not permit an aircraft to overtake another aircraft when wake turbulence separation is required.

2. Parallel runways separated by 2,500 feet but less than 4,300 feet.

(a) When aircraft are approaching from opposite base legs, or one aircraft is turning to final and another aircraft is established on the extended centerline for the adjacent runway, approved separation is provided until the aircraft are:

(1) Established on a heading or established on a direct course to a fix or cleared on an instrument approach procedure which will intercept the extended centerline of the runway at an angle not greater than 30 degrees, and,

(2) One pilot has acknowledged receipt of a visual approach clearance and the other pilot has acknowledged receipt of a visual or instrument approach clearance.

(b) When aircraft are approaching from the same side of the aerodrome and the lead aircraft is assigned the nearer runway, approved separation is maintained or pilot-applied visual separation is provided by the succeeding aircraft until intercepting the farther adjacent extended runway centerline.

(c) Provided that aircraft flight paths do not intersect, when the provisions of subparagraphs (a), (b), or (d) are met, it is not necessary to apply any other type of separation except visual separation with aircraft on the adjacent extended runway centerline.

(d) When aircraft are approaching from the same side of the aerodrome and the lead aircraft is assigned the farther runway, the succeeding aircraft must be assigned a heading that will intercept the extended centerline of the nearer runway at an angle not greater than 30 degrees. Approved separation must be maintained or pilot-applied visual separation must be provided by the succeeding aircraft until it is established on the extended centerline of the nearer runway.

NOTE—

1. The intent of the 30 degree intercept angle is to reduce the potential for overshoots of the extended centerline of the runway and preclude side-by-side operations with one or both aircraft in a "belly-up" configuration during the turn. Aircraft performance, speed, and the number of degrees of the turn are factors to be considered when vectoring aircraft to parallel runways.

2. The 30-degree intercept angle is not necessary when approved separation is maintained until the aircraft are established on the extended centerline of the assigned runway.

3. Variances between heading assigned to intercept the extended centerline of the runway and aircraft ground track are expected due to the effect of wind and course corrections after completion of the turn and pilot acknowledgment of a visual approach clearance.

4. Procedures using Radius-to-Fix legs that intercept final may be used in lieu of the 30-degree intercept provisions contained in this paragraph.

3. Parallel runways separated by 4,300 feet or more.

(a) When aircraft are approaching from opposite base legs, or one aircraft is turning to final and another aircraft is established on the extended centerline for the adjacent runway, approved separation is provided until the aircraft are:

(1) Assigned a heading or established on a direct course to a fix or cleared on an RNAV/instrument approach procedure which will intercept the extended centerline of the runway at an angle not greater than 30 degrees, and,

(2) One of the aircraft has been issued and the pilot has acknowledged receipt of the visual approach clearance.

(b) When aircraft are approaching from the same side of the aerodrome and the lead aircraft is assigned the nearer runway, approved separation is maintained or pilot-applied visual separation is provided by the succeeding aircraft until intercepting the farther adjacent extended runway centerline.

(c) Provided that aircraft flight paths do not intersect, when the provisions of subparagraphs (a), (b), or (d) are met, it is not necessary to apply any other type of separation except visual separation with aircraft on the adjacent extended runway centerline.

(d) When aircraft are approaching from the same side of the aerodrome and the lead aircraft is assigned the farther runway, the succeeding aircraft must be assigned a heading that will intercept the extended centerline of the nearer runway at an angle not greater than 30 degrees. Approved separation must be maintained or pilot-applied visual separation must be provided by the succeeding aircraft until it is established on the extended centerline of the nearer runway.

NOTE—

1. The intent of the 30 degree intercept angle is to reduce the potential for overshoots of the extended centerline of the runway and preclude side-by-side operations with one or both aircraft in a "belly-up" configuration during the turn. Aircraft performance, speed, and the number of degrees of the turn are factors to be considered when vectoring aircraft to parallel runways.

2. The 30−degree intercept angle is not necessary when approved separation is maintained until the aircraft are established on the extended centerline of the assigned runway.

3. Variances between heading assigned to intercept the extended centerline of the runway and aircraft ground track are expected due to the effect of wind and course corrections after completion of the turn and pilot acknowledgment of a visual approach clearance.

4. Procedures using Radius-to-Fix legs that intercept final may be used in lieu of 30-degree intercept provisions contained in this paragraph.

(e) Visual approaches may be conducted to one runway while visual or instrument approaches are conducted simultaneously to other runways, provided the conditions of subparagraph (a), (b), or (d) are met.

4. Intersecting and converging runways. Visual approaches may be conducted simultaneously with visual or instrument approaches to other runways, provided:

(a) Approved separation is maintained until the aircraft conducting the visual approach has been issued, and the pilot has acknowledged receipt of, the visual approach clearance.

(b) When aircraft flight paths intersect, approved separation must be maintained until visual separation is provided.

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Section 4. SPECIAL VFR (SVFR)

7-4-1 AUTHORIZATION

a. SVFR operations in weather conditions less than basic VFR minima are authorized:

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

1. At any location not prohibited by "Rules of the Air" or when an exemption to "Rules of the Air" has been granted and an associated LOA established. "Rules of the Air" does not prohibit SVFR helicopter operations.
2. Only within the boundaries of Class C, D, or E surface airspace.
3. Only when requested by the pilot.
4. On the basis of weather conditions reported at the aerodrome of intended landing/departure.

   REFERENCE—

   CLIMB TO VFR, Para 7-4-6.

   GROUND VISIBILITY BELOW 1500M, Para 7-4-7.

5. When weather conditions are not reported at the aerodrome of intended landing/departure and the pilot advises that VFR cannot be maintained and requests SVFR.

   PHRASEOLOGY:

   CLEARED TO ENTER/OUT OF/THROUGH, (name) AIRSPACE

   and if required

   (direction) OF (name) AERODROME (specified routing)

   and

   MAINTAIN SPECIAL V-F-R CONDITIONS.

   and if required

   AT OR BELOW (level)

   or

   CLEARED FOR (coded arrival or departure procedure) ARRIVAL/DEPARTURE (additional instructions as required).

   REFERENCE—

   AIRSPACE CLASSES, Para. 2-4-22

b. SVFR operations may be authorized for aircraft operating in or transiting a Class C, Class D, or Class E surface airspace when the primary aerodrome is reporting VFR but the pilot advises the basic VFR cannot be maintained.

NOTE—

The basic requirements for issuance of a SVFR clearance in subpara a. apply with the obvious exception that weather conditions at the controlling aerodrome are not required to be less than basic VFR minima.

7-4-2 PRIORITY

a. SVFR flights may be approved only if arriving and departing IFR aircraft are not delayed.

EXAMPLE:

① *A SVFR aircraft has been cleared to enter a Class C, Class D, or Class E surface airspace and subsequently an IFR aircraft is ready to depart or is in position to begin an approach. Less overall*

delay might accrue to the IFR aircraft if the SVFR aircraft is allowed to proceed to the aerodrome and land, rather than leave, a Class C, Class D, or Class E surface airspace or be repositioned to provide IFR priority.

② *A SVFR aircraft is number one for takeoff and located in such a position that the number two aircraft, an IFR flight, cannot taxi past to gain access to the runway. Less overall delay might accrue to the IFR aircraft by releasing the SVFR departure rather than by having the aircraft taxi down the runway to a turnoff point so that the IFR aircraft could be released first.*

NOTE—

The priority afforded IFR aircraft over SVFR aircraft is not intended to be so rigidly applied that inefficient use of airspace results. The controller has the prerogative of permitting completion of a SVFR operation already in progress when an IFR aircraft becomes a factor if better over-all efficiency will result.

b. Inform an aircraft of the anticipated delay when a SVFR clearance cannot be granted because of IFR traffic. Do not issue EFC or expected departure time.

PHRASEOLOGY:

EXPECT (number) MINUTES DELAY, (additional instructions as necessary).

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

APPLICATION, Para 5-6-1.

7-4-3 SEPARATION

a. Apply approved separation between:

1. SVFR aircraft.
2. SVFR aircraft and IFR aircraft.

NOTE—

Approved separation between SVFR fixed-wing aircraft, and between SVFR fixed-wing aircraft and IFR fixed-wing aircraft, is prescribed in chapter 6 and chapter 7, para 7-4-4, LEVEL ASSIGNMENT. Radar vectors are authorized as prescribed in para 5-6-1, APPLICATION, subpara f.

b. Unless otherwise authorized by CAA, alternate SVFR helicopter separation minima may be established when warranted by the volume and/or complexity of local helicopter operations. Alternate SVFR helicopter separation minima shall be established on condition that SVFR helicopters are to maintain visual reference to the surface and adhere to the following aircraft separation minima:

1. Between a SVFR helicopter and an arriving or departing IFR aircraft:
   (a) 1/2 mile. If the IFR aircraft is less than one mile from the landing aerodrome.
   (b) 1 mile. If the IFR aircraft is one mile or more from the aerodrome.
2. 1 mile between SVFR helicopters. This separation may be reduced to 200 feet if both helicopters are departing simultaneously on tracks that diverge by at least 30 degrees and:
   (a) The tower can determine this separation by reference to surface markings, or
   (b) One of the departing helicopters is instructed to remain at least 200 feet from the other.

NOTE—

Radar vectors are authorized as prescribed in para 5-6-1, APPLICATION.

REFERENCE—

GENERAL PRIORITIES, Para 2-1-5.

7-4-4 LEVEL ASSIGNMENT

Do not assign a fixed level when applying vertical separation, but clear the SVFR aircraft at or below a level which is at least 500 feet below any conflicting IFR traffic but not below the MSA prescribed in “Rules of the Air”, article 60.

PHRASEOLOGY:

MAINTAIN SPECIAL V-F-R CONDITIONS AT OR BELOW (level).

NOTE—

① SVFR aircraft are not assigned fixed levels to maintain because of the clearance from clouds requirement.

② “Rules of the Air” Article 60: Except when necessary for take-off or landing, or except by permission from CAA, a VFR flight shall not be flown:

(a) Over the congested areas of cities, towns or settlements or over an open-air assembly of persons at a height less than 1000 feet above the highest obstacle within a radius of 2000 feet from the aircraft,

(b)Elsewhere at a height less than 500 feet above the ground or water.

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

APPLICATION, Para 5-6-1.

7-4-5 LOCAL OPERATIONS

Authorize local SVFR operations for a specified period (series of landings and takeoffs, etc.) upon request if the aircraft can be recalled when traffic or weather conditions require. Where warranted, LOAs may be consummated.

PHRASEOLOGY:

LOCAL SPECIAL V-F-R OPERATIONS IN THE IMMEDIATE VICINITY OF (name) AERODROME ARE AUTHORIZED UNTIL (time). MAINTAIN SPECIAL V-F-R CONDITIONS.

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

7-4-6 CLIMB TO VFR

Authorize an aircraft to climb to VFR upon request if the only weather limitation is restricted visibility.

PHRASEOLOGY:

CLIMB TO V-F-R WITHIN (name) AIRSPACE / WITHIN (a specified distance) MILES FROM (aerodrome name) AERODROME, MAINTAIN SPECIAL V-F-R CONDITIONS UNTIL REACHING V-F-R.

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

AIRSPACE CLASSES, Para 2-4-22.

AUTHORIZATION, Para 7-4-1.

7-4-7 GROUND VISIBILITY BELOW 1,500M

Treat requests for SVFR operations as follows when the ground visibility is officially reported at an aerodrome as less than 1,500m:

NOTE—

“Rules of the Air” article 64 prohibits SVFR flights when ceiling is less than 500 feet.

a. Inform departing aircraft that ground visibility is less than 1,500m and that a clearance cannot be issued.

b. Inform arriving aircraft, operating outside of a Class C, Class D, or Class E surface airspace, that ground visibility is less than 1,500m and that, unless an emergency exists, a clearance cannot be issued.

c. Inform arriving aircraft, operating within a Class C, Class D, or Class E surface airspace, that ground visibility is less than 1,500m, and request the pilot to advise intentions.

PHRASEOLOGY:

(name of aerodrome) VISIBILITY IS LESS THAN ONE THOUSAND FIVE HUNDRED METERS. ADVISE INTENTIONS.

NOTE—
Clear an aircraft to land at an aerodrome with an operating control tower, traffic permitting, if the pilot reports the aerodrome in sight. The pilot is responsible to continue to the aerodrome or exit the surface airspace. "Rules of the Air" prohibits VFR aircraft from landing at any aerodrome within a surface airspace when ground visibility is less than 1500m. A pilot could inadvertently encounter conditions that are below SVFR minimum after entering a surface airspace due to rapidly changing weather. The pilot is best suited to determine the action to be taken since pilots operating under SVFR are not required to be instrument rated, and the possibility exists that flight visibility may not be the same as ground visibility. "Rules of the Air" (Article 5) authorizes a pilot encountering an in-flight emergency requiring immediate action to deviate from any rule of "Rules of the Air" to the extent required to meet that emergency. Flight into adverse weather conditions may require the pilot to execute the emergency authority granted in "Rules of the Air" (Article 5) and continue inbound to land.

d. Clear an aircraft to fly through a Class C, Class D, or Class E surface airspace if the aircraft reports flight visibility is at least 1,500m.

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

AUTHORIZATION, Para 7-4-1.

7-4-8 FLIGHT VISIBILITY BELOW 1,500M

Treat requests for SVFR fixed-wing operations as follows when weather conditions are not reported at an aerodrome and the pilot advises the flight visibility is less than 1,500m:

NOTE—
"Rules of the Air" prescribes the visibility for basic VFR and SVFR operations as the official reported ground visibility at aerodromes where provided and landing or takeoff "flight visibility" where there is no official reported ground visibility.

a. Inform departing aircraft that a clearance cannot be issued.

b. Inform arriving aircraft operating outside of a Class C, Class D or Class E surface airspace that a clearance cannot be issued unless an emergency exists.

c. Request the intentions of an arriving aircraft operating within a Class C, Class D or Class E surface airspace.

NOTE—
Clear an aircraft to land at an aerodrome with an operating control tower, traffic permitting, if the pilot reports the aerodrome in sight. The pilot is responsible to continue to the aerodrome or exit the surface area. A pilot could inadvertently encounter conditions that are below SVFR minimums after entering a surface area due to rapidly changing weather. The pilot is best suited to determine the action to be taken since pilots operating under SVFR between sunrise and sunset are not required to be instrument rated, and the possibility exists that flight visibility may not be the same as ground visibility. A pilot encountering an inflight emergency requiring immediate action to deviate from any rule to the extent required to meet that emergency. Flight into adverse weather conditions may require the pilot to execute the emergency authority granted and continue inbound to land.

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

Section 5. BASIC ATS SURVEILLANCE SERVICE TO VFR AIRCRAFT – TERMINAL

7-5-1 APPLICATION

a. Basic ATS surveillance service for VFR aircraft at or above MVA shall include:

1. Safety alerts.
2. Traffic information.
3. Limited vectoring when requested by the pilot.
4. Sequencing at locations where procedures have been established for this purpose and/or when covered by a LOA.

b. Apply the procedures contained in para 7-1-4, APPROACH CONTROL SERVICE FOR VFR ARRIVING AIRCRAFT, when arriving VFR aircraft are handled by approach control and provide vectoring service in accordance with Chapter 5. ATS surveillance, Section 7. SPEED ADJUSTMENT, in addition to the ATS surveillance service prescribed in para 5-6-1, APPLICATION, and para 5-6-2, METHODS.

REFERENCE—
SURFACE AREAS, Para 2-1-16.

7-5-2 SERVICE AVAILABILITY

a. Inform aircraft on initial contact whenever this service cannot be provided because of radar outage and apply para 7-1-4, Approach Control Service For VFR Arriving Aircraft.

b. Provide the service, to the extent possible using an available frequency, if an aircraft desires the service but cannot communicate on the appropriate frequencies. Aircraft which do not desire radar service may be fitted into the landing sequence by the tower. Coordination of these aircraft shall be accomplished with the approach control unless a unit directive/LOA prescribes otherwise. Nonparticipating aircraft shall, to the extent possible, be given the same landing sequence they would have received had they been sequenced by radar vectors.

c. Radar sequencing to the primary aerodrome, when local procedures have been developed, shall be provided unless the pilot states that the service is not requested. Arriving aircraft are assumed to want radar service unless the pilot states “Negative radar service”, or makes a similar comment.

7-5-3 INITIAL CONTACT

An aircraft sighted by the aerodrome controller at the time of first radio contact may be positioned in the landing sequence after coordination with approach control.

7-5-4 IDENTIFICATION

Identify the aircraft before taking action to position it in the approach sequence.

7-5-5 HOLDING

Hold VFR aircraft over the initial reporting fix or a fix near the aerodrome when holding is required to establish an approach sequence.

REFERENCE—
VISUAL HOLDING OF VFR AIRCRAFT, Para 7-1-5.

7-5-6 APPROACH SEQUENCE

Do not assign landing sequence numbers, when establishing aircraft in the approach sequence, unless this responsibility has been delegated in a LOA or unit directive.

NOTE—

The landing sequence is ordinarily established by the tower.

7-5-7 SEQUENCING

a. Establish radar contact before instructing a VFR aircraft to enter the traffic circuit at a specified point or vectoring the aircraft to a position in the approach sequence. Inform the pilot of the aircraft to follow when the integrity of the approach sequence is dependent on following a preceding aircraft. Ensure visual contact is established with the aircraft to follow and provide instruction to follow that aircraft.

PHRASEOLOGY:
FOLLOW (description) (position, if necessary).

b. Direct a VFR aircraft to a point near the aerodrome to hold when a position is not available in the approach sequence for the runway in use. The aircraft may be vectored to another runway after coordination with the tower.

c. Apply the following procedures to VFR aircraft being radar sequenced:

1. The provisions of para 5-5-4, MINIMA, subparas e and f.

2. When parallel runways are less than 760m/2,500 feet apart, do not permit a HEAVY to overtake any aircraft nor a MEDIUM aircraft to overtake a LIGHT aircraft established on final within the unit’s area of responsibility.

7-5-8 CONTROL TRANSFER

a. Inform the tower of the aircraft's position and then instruct the pilot to contact the tower.

b. The aircraft may be instructed to contact the tower prior to the tower being advised of the aircraft's position provided:

3. The tower advises the aircraft is in sight and,

4. Space is available in the landing sequence.

c. Instruct the pilot to contact the tower at the appropriate point when the ATMS aircraft track label is being displayed on the tower's ASD, and a unit directive specifies change of communications and control jurisdiction points.

NOTE—

The point at which an aircraft is instructed to contact the tower is determined by prior coordination between the tower and approach control and will vary, depending on the runway in use, weather, etc.. The transfer of communications ordinarily occurs at least 5 miles from the runway. The point for the transfer of communications should be a sufficient distance from the aerodrome to permit the tower to properly sequence the aircraft, but not at a distance that could derogate the provision of radar traffic information service.

7-5-9 ABANDONED APPROACH

Instruct the aircraft to change to approach control for sequencing when an aircraft, under tower control, abandons the approach and coordination with approach control reveals no immediate space in the approach sequence.

7-5-10 VFR DEPARTURE INFORMATION

Inform departing VFR aircraft who request radar traffic information when to contact departure control and the frequency to use. Provide traffic information in accordance with para 2-1-22, Traffic Information, after the departure is radar identified.

NOTE—
Departing aircraft desiring traffic information are expected to request the service and to state their proposed direction of flight upon initial contact with ground control.

7-5-11 TERMINATION OF SERVICE

Basic ATS surveillance service should be provided to the extent possible, workload permitting, until 20 miles from the radar site or the airspace boundary, whichever is less. Terminate radar service to aircraft landing at aerodromes other than those where sequencing service is provided at a sufficient distance from the aerodrome to permit the pilot to change to the appropriate frequency for traffic and aerodrome information.

PHRASEOLOGY:

RADAR SERVICE TERMINATED, SQUAWK VFR.

then

CONTACT (frequency identification)

or

FREQUENCY CHANGE APPROVED.

7-5-12 SERVICE PROVIDED WHEN TOWER IS INOPERATIVE

a. Provide the following services during hours when the tower is not in operation:

1. Wind direction and speed.

NOTE—
Issue information provided from the FIS or AWS. Otherwise, inform the pilot that wind information is not available.

2. Traffic information.

3. Inform aircraft when radar service is terminated

REFERENCE—
TERMINATION OF ATS SURVEILLANCE SERVICE, PARA 5-1-7.

b. Do not assign landing sequence.

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Section 6. CLASS C SERVICE – TERMINAL

7-6-1 APPLICATION

Apply Class C service procedures within the designated Class C airspace. Class C services are designed to keep ATC informed of all aircraft within Class C airspace, not to exclude operations. Two-way radio communications and operational transponder are required for operations within Class C airspace.

REFERENCE—

VISUAL SEPARATION, Para 7-2-1.

7-6-2 CLASS C SERVICES

a. Class C services include the following:

1. Sequencing of all aircraft to the primary aerodrome.
2. Standard IFR services to IFR aircraft.
3. Separation, traffic information, and safety alerts between IFR and VFR aircraft.
4. Mandatory traffic advisories and safety alerts between VFR aircraft.

b. Provide Class C services to all aircraft operating within Class C airspace.

c. Aircraft should not normally be held. However, if holding is necessary, inform the pilot of the expected length of delay.

REFERENCE—

VISUAL SEPARATION, Para 7-2-1.

7-6-3 SEPARATION

Separate VFR aircraft from IFR aircraft by any one of the following:

a. Visual separation as specified in para 7-2-1, VISUAL SEPARATION, para 7-3-2, VECTORS FOR VISUAL APPROACH, and para 7-5-7, SEQUENCING.

NOTE—

Issue wake turbulence cautionary advisories in accordance with para 2-1-20, Wake Turbulence Caution.

b. 500 feet vertical separation.

NOTE—

Apply the provisions of para 5-5-4, Minima, when wake turbulence separation is required.

c. 1 1/2 mile separation. The application of 1 1/2 mile separation will be applied by ATS unit and individually approved by the CAA.

REFERENCE—

ATS SURVEILLANCE SYSTEMS CAPABILITIES, Para 5-1-3

VISUAL SEPARATION, Para 7-2-1

7-6-4 CLEARANCE TO ENTER CLASS C AIRSPACE

When a pilot makes radio contact to enter Class C airspace, issue a clearance, or, if workload or traffic conditions prevent immediate issue of a clearance, issue instructions to remain outside Class C airspace.

PHRASEOLOGY:

ENTER CHARLIE AIRSPACE VIA ... (significant point OR ROUTE) AT ... [or ON CLIMB or DESCENT

TO] … (level)

REMAIN OUTSIDE CHARLIE AIRSPACE EXPECT … (minutes) DELAY

.

7-6-5 VFR LEVEL ASSIGNMENTS

a. A VFR aircraft which has been assigned a level not in accordance with “Rules of the Air”:

   1. When the level is no longer needed for separation, shall be cleared to a level appropriate for the direction of flight, or

   2. When leaving Class C airspace, shall be advised to resume the appropriate level.

PHRASEOLOGY:

RESUME APPROPRIATE VFR LEVELS

b. Levels assigned to VFR flights must allow for compliance with “Rules of the Air” 60 (minimum height for VFR flight).

7-6-6 ADJACENT AERODROME OPERATIONS

Aircraft that will penetrate Class C airspace after departing controlled aerodromes within or adjacent to Class C airspace shall be provided the same services as those aircraft departing the primary aerodrome. Procedures for handling this situation shall be covered in a LOA or a unit directive, as appropriate.

Chapter 8. SPECIAL FLIGHTS

Section 1. FLIGHT CHECK OPERATIONS

8-1-1 GENERAL

Provide aircraft engaged in the flight inspection of NAVAIDs with maximum assistance. Unless otherwise agreed to, maintain direct contact with the pilot and exchange information regarding known traffic in the area and his/her intentions.

NOTE—

① Many flight inspections are accomplished using automatic recording equipment, and an uninterrupted flight is necessary for successful completion of the mission. The workload for the limited number of aircraft engaged in these activities requires strict adherence to a schedule.

② Flight inspection operations which require special participation of ground personnel, specific communications, or radar operation capabilities are considered to require special handling. These flights are coordinated with appropriate units before departure.

8-1-2 SPECIAL HANDLING

a. Clear the aircraft according to pilot request as soon as practicable. Do not ask the pilot to deviate from his/her planned action except to preclude an emergency situation.

b. Issue radar advisories to the flight inspection aircraft where adequate coverage exists and to the extent permitted by workload.

c. Suggest flight path adjustments, as required, for any aircraft which will enter or penetrate an area in which a flight inspection function is being performed.

d. Provide special handling, as required, to military or CAA aircraft conducting flight inspections using the call sign "Flight Check". The call sign “Flight Check (Nr) recorded” indicates automated flight inspections are in progress in terminal areas.

NOTE—

The flight inspection aircraft will file flight plans using the call sign "FLIGHT CHECK" during flight inspections or when inbound to conduct flight inspections. Flight plan remarks may indicate type NAVAID inspection to be accomplished; e.g. “FC APU VOR”.

8-1-3 FLIGHT CHECK AIRCRAFT

a. Provide special handling, as required, to expedite flight inspection of NAVAID's, direction finding (DF) equipment, and RADAR by flight check aircraft.

NOTE—

Certain flight inspection maneuvers require operations in close proximity to the surface. These maneuvers can only be performed during daylight visual meteorological conditions. Preplanned automatic flight places the following limitations on the capability of the pilot to adhere to normal ATC clearances:

① Route of flight – orbital from 6 nautical miles to a maximum of 40 nautical miles from the facility depending on the type of inspection. During commissioning flight checks all SID’s, STAR’s, airways, DME fixes, and approaches must be flown.

② Altitude assignment – from 1,000 feet above the antenna site up to the minimum en route altitude (MEA).

REFERENCE—

SPECIFIC PRIORITY, Para 2-1-6.

b. Avoid changes in the route or level from that filed by the pilot in the initial flight plan.

c. Do not impose air traffic control delays in the flight except to preclude emergency situations.

d. Do not change the previously assigned discrete beacon code of special radar accuracy flight check aircraft.

Section 2. SPECIAL OPERATIONS

8-2-1 AIRCRAFT CARRYING DANGEROUS MATERIALS

a. Provide the following special handling to military aircraft or military contracted aircraft carrying dangerous materials when:

1. The words “Dangerous Cargo” or “Inert Devices,” or both are contained in the remarks section of the filed flight plan, or

NOTE—

① Certain types of military flights carrying dangerous materials require strict adherence to military regulations and flight planning along carefully selected routes. These flights must avoid heavily populated areas.

② "Inert Devices" are devices containing no dangerous materials but closely resembling nuclear or explosive items that are classified as dangerous and could be easily mistaken for their dangerous counterparts.

2. The pilot uses these words in radio communication.

b. If it becomes necessary to issue a clearance to amend the route/level, advise the pilot:

1. Of the proposed change, and

2. The amount of delay to expect if it is necessary to maintain the present route/level.

c. When it becomes necessary for the pilot to refuse a clearance amending his route/level, he will advise if the traffic delay is acceptable or if an alternate route/level is desired. In such cases, offer all possible assistance.

d. When the aircraft is provided an en route descent, do not vector the aircraft from the planned route unless the pilot concurs.

e. Use special patterns and routings in areas where they have been developed for these flights. If special patterns and routings have not been developed, employ normal procedures.

8-2-2 EXPERIMENTAL AIRCRAFT OPERATIONS

a. When notified that an experimental aircraft requires special handling:

NOTE—

Each person operating an aircraft with an experimental certificate shall notify the control tower of the experimental nature of the aircraft when operating into or out of aerodromes with operating control towers.

1. Clear the aircraft according to pilot requests as traffic permits and if not contrary to ATC procedures.

2. Once approved, do not ask the pilot to deviate from a planned action except to preclude an emergency situation.

b. At locations where volume or complexity of experimental aircraft operations warrant, a letter of agreement may be consummated between the unit and operator.

8-2-3 CAA RESEARCH AND DEVELOPMENT FLIGHTS

Where coordinated in advance and traffic permits, clear aircraft for special procedures flights participating in CAA research and development test activities as requested by the pilot. The special procedures shall be applied to participating aircraft/vehicles.

NOTE—
Special flight procedures for CAA research and development test activities must be approved by the AIR TRAFFIC SERVICES DIVISION.

8-2-4 INTERCEPTOR OPERATIONS

a. Provide maximum assistance to military interceptor aircraft (scrambles) in special military operations.

NOTE—

The CAA and the military have mutually agreed to the implementation of policies and procedures for control of air defense interceptor operations. Effective coordination and cooperation between CAA and the military at all levels are essential if policy objectives are to be met.

b. As soon as an air traffic services unit learns that an aircraft is being intercepted in your area of responsibility, take such of the following steps as are appropriate:

1. Attempt to establish two-way communication with the intercepted aircraft on any available frequency, including the emergency frequency 121.5 MHz, unless such communication already exists.
2. Inform the pilot of the intercepted aircraft of the interception.
3. Establish contact with the intercept control unit maintaining two-way communication with the intercepting aircraft and provide it with available information concerning the aircraft.
4. Relay messages between the intercepting aircraft or the intercept control unit and the intercepted aircraft, as necessary.
5. In close coordination with the intercept control unit take all necessary steps to ensure the safety of the intercepted aircraft.
6. inform ATS units serving adjacent FIRs if it appears that the aircraft has strayed from such adjacent FIRs.

c. As soon as an air traffic services unit learns that an aircraft is being intercepted outside your area of responsibility, take such of the following steps as are appropriate:

1. Inform the ATS unit serving the airspace in which the interception is taking place, providing this unit with available information that will assist in identifying the aircraft and requesting it to take action in accordance with subpara ‘b’ above.
2. Relay messages between the intercepted aircraft and the appropriate ATS unit, the intercept control unit or the intercepting aircraft.

8-2-5 AVOIDANCE OF AREAS OF NUCLEAR RADIATION

a. Advise pilots whenever their proposed flight path will traverse a reported or forecasted area of hazardous radiation and reroute the aircraft when requested by the pilot.

b. Inform pilots when an airfield of intended landing lies within a reported or forecasted area of hazardous radiation and request the pilot to advise his intentions.

8-2-6 NONSTANDARD FORMATION OPERATIONS

Occasionally the military is required to operate in a nonstandard formation and controllers should be knowledgeable of the various tactics employed and the procedures used.

NOTE—

Formation leaders are responsible for obtaining ATC approval to conduct nonstandard formation operations.

Section 3. SPECIAL USE AND ATC ASSIGNED AIRSPACE

8-3-1 APPLICATION

Apply the procedures in this section to aircraft operating in proximity to special use or ATC assigned airspace (ATCAA) unless the airspace is designated an Alert Area/Controlled Firing Area or one of the following conditions exist:

NOTE—
These procedures are not applicable to Alert Areas or Controlled Firing Areas.

a. The pilot informs you that permission has been obtained from the using agency to operate in the airspace.

b. The using agency informs you they have given permission for the aircraft to operate in the airspace.

NOTE—
Using agency permission may be relayed to the pilot.

c. The Restricted/Danger Area, or ATCAA has been released to the controlling agency.

d. The aircraft is on an approved ALTRV.

NOTE—
Mission project officers are responsible for obtaining approval for ALTRV operations within Prohibited/Restricted/Danger Areas.

REFERENCE—
TRANSITING ACTIVE SUA/ATCAA, Para 8-3-3.

8-3-2 SEPARATION MINIMA

Unless clearance of nonparticipating aircraft in/through/adjacent to a Prohibited/Restricted/Danger Area/ATCAA is provided for in a Letter of Agreement (LOA) or Letter of Procedure (LOP), separate nonparticipating aircraft from active special use airspace and ATCAA by the following minima:

a. Assign a level consistent with para 4-5-2, FLIGHT DIRECTION, and para 4-5-3, EXCEPTIONS, which is at least 500 feet (above FL 290 — 1000 feet) above/below the upper/lower limit of the Prohibited/Restricted/Danger Area/ATCAA.

b. Provide radar separation of 3 miles (FL600 and above — 6 miles) from the special use airspace peripheral boundary.

c. Clear aircraft on airways or routes whose widths or protected airspace do not overlap the peripheral boundary.

d. Exception. Some Prohibited/Restricted/Danger Areas are established for security reasons or to contain hazardous activities not involving aircraft operations. The above minima for these Prohibited/Restricted Areas is not required if the areas have been identified by unit management. When separation minima is not required, vector aircraft to avoid the airspace.

NOTE—
Nonparticipating aircraft refers to those aircraft for which you have separation responsibility and which have not been authorized by the using agency to operate in/through the special use airspace or ATCAA..

8-3-3 TRANSITING ACTIVE SUA/ATCAA

If a LOA/LOP has been coordinated with the Using Agency and permission has been granted to transit the area:

a. Comply with the instruction/clearances issued by the Using Agency and provide the applicable separation minima between aircraft when two or more aircraft are transiting the area, or

NOTE—
Some Using Agencies are also air traffic control units.

b. If unable to comply with instructions/clearances, clear the aircraft in accordance with para 8-3-2, Separation Minima.

NOTE—
The CAA has no jurisdictional authority over the use of non-joint-use Prohibited/Restricted/Danger area airspace; therefore, clearance cannot be issued for flight therein without the appropriate approval.

Section 4. FUEL DUMPING

8-4-1 INFORMATION REQUIREMENTS

When information is received that an aircraft plans to dump fuel, determine the route and level it will fly and the weather conditions in which the operation will be conducted.

8-4-2 ROUTING

Except when it is dumping fuel for emergency reasons, aircraft in either VFR or IFR conditions may be requested to fly a different route.

8-4-3 LEVEL ASSIGNMENT

If an aircraft is dumping fuel in IFR conditions, assign a level at least 2,000 feet above the highest obstacle within 5 miles of the route or pattern being flown.

8-4-4 SEPARATION MINIMA

Separate known aircraft from the aircraft dumping fuel as follows:

a. IFR aircraft by one of the following:

   1. *1,000 feet* (*2,000 feet* above FL 290) above it.
   2. *2,000 feet* below it.
   3. *5 miles* radar.
   4. *5 miles* laterally.

b. VFR radar-identified aircraft by *5 miles* and in accordance with para 5-6-1, APPLICATION.

8-4-5 INFORMATION DISSEMINATION

a. If you are in contact with an aircraft when it starts dumping fuel, inform other controllers and units which might be concerned. Units concerned shall broadcast an advisory on appropriate radio frequencies at 3-minute intervals until the dumping stops.

   PHRASEOLOGY:

   ATTENTION ALL AIRCRAFT. FUEL DUMPING IN PROGRESS OVER (location) AT (level) BY (type aircraft) (flight direction).

b. Broadcast a terminating advisory when the fuel dumping operation is completed.

   PHRASEOLOGY:

   ATTENTION ALL AIRCRAFT FUEL DUMPING OVER (location) TERMINATED.

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Section 5. UNMANNED FREE BALLOONS

8-5-1 APPLICATION

a. On receipt of notification of the intended flight of a medium or heavy unmanned free balloon, the air traffic services unit shall arrange for the information to be disseminated to all concerned. The information shall include:

1. The balloon flight identification or project code name;
2. Balloon classification and description;
3. SSR Code or NDB frequency as applicable;
4. The launch site;
5. The estimated time of the commencement of the launch or the planned period of the launches;
6. The expected direction of ascent;
7. The cruising level(s) (pressure-altitude); and
8. The estimated elapsed time to pass 60,000 ft pressure-altitude, or to reach cruising level if at or below 60,000 ft, together with the estimated location.

b. On receipt of notification that a medium or heavy unmanned free balloon has been launched, the air traffic services unit shall arrange for the information to be disseminated to all concerned. The information shall include:

1. The balloon flight identification or project code name;
2. Balloon classification and description;
3. SSR Code or NDB frequency as applicable;
4. The launch site;
5. The time of launch(es);
6. The estimated time at which 60,000 ft pressure-altitude will be passed, or the estimated time at which the cruising level will be reached if at or below 60,000 ft, and the estimated location;
7. The estimated date and time of termination of the flight; and
8. The planned location of ground contact, when applicable

c. When there is reasonable expectation that a heavy or medium unmanned free balloon will cross international borders, the appropriate ATS unit shall arrange for the prelaunch and the launch notifications to be sent by NOTAM to the ATS unit(s) in the State(s) concerned. If agreed between the States concerned, the launch notification may be transmitted orally by direct ATS speech circuit between the ACCs/flight information centres involved.

d. Air traffic services units shall maintain radar surveillance of medium and heavy unmanned free balloons to the extent possible and, if necessary and on the request of the pilot of an aircraft, provide radar separation between the aircraft and such balloons which are radar identified or their exact position is known.

e. Provide traffic information to all affected aircraft during initial contact specifying the balloon's known or estimated position, direction of movement, and altitude as "unknown" or "reported," as appropriate.

NOTE—
Unless ATC requires otherwise, operators of unmanned free balloons are required to monitor the course of the balloon and record its position at least every two hours. Position reports are not forwarded by the operator unless requested by ATC.

PHRASEOLOGY:

UNMANNED FREE BALLOON OVER (name of location),

or

ESTIMATED OVER (name of location), MOVING (direction of movement).

LAST REPORTED LEVEL AT (level as reported by the operator or determined from pilot report),

or

LEVEL UNKNOWN.

REFERENCE—

DERELICT BALLOONS, Para 8-5-2.

8-5-2 DERELICT BALLOONS

Balloons become derelict when a moored balloon slips its mooring and becomes a hazard to air navigation or when an unmanned free balloon flight cannot be terminated as planned. When this occurs:

a. In the case of a moored balloon which has slipped its moorings, issue traffic information.

b. In the case of an unmanned free balloon, flight follow the balloon and, to the extent possible, provide aircraft under your control separation from the balloon.

c. Forward balloon position information received from pilot reports or derived from radar returns to your supervisor for further dissemination.

d. If radar contact with the balloon is lost, broadcast an advisory to all aircraft operating in the airspace affected by the derelict balloon at 10-minute intervals continuing until the derelict balloon is no longer a factor.

PHRASEOLOGY:

ADVISORY TO ALL AIRCRAFT

DERELICT BALLOON REPORTED IN THE VICINITY OF (location),

or

ESTIMATED IN VICINITY OF (location),

or

REPORTED OVER (location),

or

RADAR REPORTED OVER (location).

LAST REPORTED LEVEL AT (level as reported by operator or pilot report),

or

LEVEL UNKNOWN.

Section 6. PARACHUTE JUMPING

8-6-1 COORDINATION

Coordinate any pertinent information prior to and at the end of each parachute jump or series of jumps which begins or ends in your area of jurisdiction with other affected ATC units/sectors.

8-6-2 CLASS A AND CLASS C AIRSPACE

a. Authorize parachute jumping only within airspace designated for the jumping activity.

b. Separate aircraft, other than those participating in the jump operation, from the airspace authorized for the jumping activity.

c. Impose, as necessary, any conditions and restrictions which in your judgment would promote the safety of the operation.

8-6-3 CLASS D AND CLASS E SURFACE AIRSPACE

TERMINAL

Handle requests to conduct jump operations in or into Class D airspace in which there is a functioning control tower as follows:

a. Authorized parachute jumping with respect to known or observed traffic.

b. Issue traffic information to the jump aircraft and to nonparticipating aircraft as necessary for the safe conduct of the jump operation.

8-6-4 OTHER CONTROL AIRSPACE

Handle notifications to conduct jump operations in other Class E airspace as follows:

a. Issue a traffic information to the jump aircraft before the jump. Include aircraft type, level, and direction of flight of all known traffic which will transit the airspace within which the jump will be conducted.

NOTE—
Unless otherwise authorized by ATC, parachute jumping is not allowed in or into Class E airspace unless radio communications have been established between the aircraft and the nearest ATC unit at least 5 minutes before the jumping activity is to begin for the purpose of receiving information in the aircraft about known air traffic in the vicinity of the jump aircraft.

b. Issue traffic information to all known aircraft which will transit the airspace within which the jump operations will be conducted. Information shall consist of the location, time, duration, and level from which the jump will be made.

c. When time or numbers of aircraft make individual transmissions impractical, advisories to nonparticipating aircraft may be broadcast on appropriate control frequencies, or when available, the ATIS broadcast.

d. When requested by the pilot and to the extent possible, assist nonparticipating aircraft to avoid the airspace within which the jump will be conducted.

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Chapter 9. EMERGENCIES

Section 1. GENERAL

9-1-1 EMERGENCY DETERMINATIONS

a. An emergency can be either a Distress or an Urgency condition.

b. A pilot who encounters a *Distress* condition should declare an emergency by beginning the initial communication with the word "Mayday," preferably repeated three times. For an *Urgency* condition, the word "Pan-Pan," should be used in the same manner.

c. If the words "Mayday" or "Pan-Pan" are not used and you are in doubt that a situation constitutes an emergency or potential emergency, handle it as though it were an emergency.

d. Because of the infinite variety of possible emergency situations, specific procedures cannot be prescribed. However, when you believe an emergency exists or is imminent, select and pursue a course of action which appears to be most appropriate under the circumstances and which most nearly conforms to the instructions in this manual.

9-1-2 OBTAINING INFORMATION

Obtain enough information to handle the emergency intelligently. Base your decision as to what type of assistance is needed on information and requests received from the pilot because he/she is authorized by "Rules of the Air" to determine a course of action.

9-1-3 PROVIDING ASSISTANCE

Provide maximum assistance to aircraft in distress. Enlist the services of available radar units and the military services, as well as their emergency services and units, when the pilot requests or when you deem necessary.

REFERENCE—

SPECIFIC PRIORITIES, Para 2-1-6.

9-1-4 RESPONSIBILITY

a. If you are in communication with an aircraft in distress, handle the emergency and coordinate and direct the activities of assisting units. Transfer this responsibility to another unit only when you feel better handling of the emergency will result.

b. When you receive information about an aircraft in distress, forward detailed data to ACC.

NOTE—

① The National SAR Plan assigns search and rescue responsibilities as follows:

(a) All units follow the National Rescue Command Center's instructions - Conducting physical search and rescue operations.

(b) To the CAA

(1) Providing emergency service to aircraft in distress.

(2) Assuring that SAR procedures will be initiated if an aircraft becomes overdue or unreported. This is accomplished through the ATC system for IFR aircraft and the flight plan system for VFR aircraft.

(3) Attempting to locate overdue or unreported aircraft by INREQ and Notification communications search.

(4) Making all possible units available for use by the searching agencies.

② ACC serves as the central points for collecting information, for coordinating with NRCC, and for conducting a communications search by distributing any necessary Notifications concerning:

(a). overdue or missing IFR aircraft

(b).IFR aircraft in an emergency situation occurring in their respective area.

(c).Aircraft on a combination VFR/IFR or an airfiled IFR flight plan and 30 minutes have passed since the pilot requested IFR clearance and neither communication nor radar contact can be established with it. For SAR purposes, these aircraft are treated the same as IFR aircraft.

(d).Overdue or missing aircraft which have been authorized to operate in accordance with Special VFR clearance.

③ ACC serves as the central point for collecting information and coordinating with the NRCC on ELT signals.

④ Notifying ACC about a VFR aircraft emergency allows provision of IFR separation if considered necessary.

REFERENCE—

EMERGENCY SITUATIONS, Para 9-2-5.

INFORMATION TO BE FORWARDED TO ACC, Para 9-3-2.

INFORMATION TO BE FORWARDED TO NRCC, Para 9-3-3.

c. If the aircraft involved is operated by a foreign air carrier, notify ACC serving the departure or destination point, when either point is within the TAIPEI FIR, for relay to the operator of the aircraft.

d. The ACC shall be responsible for receiving and relaying all pertinent ELT signal information to the appropriate authorities.

REFERENCE—
EMERGENCY LOCATOR TRANSMITTER (ELT) SIGNALS, Para 9-2-13.

e. When consideration is given to the need to escort an aircraft in distress, evaluate the close formation required by both aircraft. Special consideration should be given if the maneuver takes the aircraft through the clouds.

f. Before a determination is made to have an aircraft in distress be escorted by another aircraft, ask the pilots if they are familiar with and capable of formation flight.

1. Do not allow aircraft to join up in formation during emergency conditions, unless:

(a) The pilots involved are familiar with and capable of formation flight.

(b) They can communicate with one another, and have visual contact with each other.

2. If there is a need for aircraft that are not designated as search and rescue aircraft to get closer to one another than radar separation standards allow, the maneuver shall be accomplished, visually, by the aircraft involved.

9-1-5 COORDINATION

Coordinate efforts to the extent possible to assist any aircraft believed overdue, lost, or in emergency status.

9-1-6 AERODROME GROUND EMERGENCY

TERMINAL

a. When an aerodrome emergency occurs, give priority to emergency vehicles over all other surface movement traffic. If necessary, stop all surface movement traffic until the progress of the emergency vehicles will not be impeded. This also applies when routes within the aerodrome proper are required for movement of local emergency equipment going to or from an emergency which occurs outside the aerodrome proper.

NOTE—

Aircraft operated in proximity to accident or other emergency or disaster locations may cause hindrances to airborne and surface rescue or relief operations. Congestion, distraction or other effects, such as wake turbulence from nearby airplanes and helicopters, could prevent or delay proper execution of these operations.

b. Workload permitting monitor the progress of emergency vehicles responding to a situation. If necessary, provide available information to assist responders in finding the accident/incident scene.

9-1-7 IN-FLIGHT EMERGENCIES INVOLVING MILITARY FIGHTER-TYPE AIRCRAFT

a. The design and complexity of military fighter-type aircraft places an extremely high workload on the pilot during an in-flight emergency. The pilot's full attention is required to maintain control of the aircraft. Therefore, radio frequency and transponder code changes should be avoided and radio transmissions held to a minimum, especially when the aircraft experiencing the emergency is at low level.

b. Pilots of military fighter-type aircraft, normally single engine, experiencing or anticipating loss of engine power or control may execute a flameout pattern in an emergency situation. Circumstances may dictate that the pilot, depending on the position and nature of the emergency, modify the pattern based on actual emergency recovery requirements.

c. Military airfields with an assigned flying mission may conduct practice emergency approaches. Participating units maintain specific procedures for conducting these operations.

REFERENCE—

SIMULATED FLAMEOUT (SFO) APPORACHES/PRACTICE PRECAUTIONARY APPROACHES, Para 3-10-12.

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Section 2. EMERGENCY ASSISTANCE

9-2-1 INFORMATION REQUIREMENTS

a. Start assistance as soon as enough information has been obtained upon which to act. Information requirements will vary, depending on the existing situation. Minimum required information for in-flight emergencies is:

NOTE—
In the event of an ELT signal see 9-2-13 Emergency Locator Transmitter (ELT) Signals.

1. Aircraft identification and type.
2. Nature of the emergency.
3. Pilot's desires.

b. After initiating action, obtain the following items or any other pertinent information from the pilot or aircraft operator, as necessary:

NOTE—
Normally, do not request this information from military fighter-type aircraft that are at low levels (i.e. on approach, immediately after departure, on a low level route etc.). However, request the position of an aircraft that is not visually sighted or displayed on radar if the location is not given by the pilot.

1. Aircraft level.
2. Fuel remaining in time.
3. Pilot reported weather.
4. Pilot capability for IFR flight
5. Time and place of last known position.
6. Heading since last known position.
7. Airspeed.
8. Navigation equipment capability.
9. NAVAID signals received.
10. Visible landmarks.
11. Aircraft color.
12. Number of people on board.
13. Point of departure and destination.
14. Emergency equipment on board.

9-2-2 FREQUENCY AND SSR CODE CHANGES

Changes of radio frequency and SSR code should be avoided if possible and should normally be made only when or if an improved service can be provided to the aircraft concerned. Maneuvering instructions to an aircraft experiencing engine failure should be limited to a minimum. When appropriate, other aircraft operating in the vicinity of the aircraft in emergency should be advised of the circumstances.

9-2-3 AIRCRAFT ORIENTATION

Orientate an aircraft by the means most appropriate to the circumstance. Recognized methods include:

a. Radar.

b. NAVAIDS.

c. Pilotage.

d. Sighting by other aircraft.

9-2-4 LEVEL CHANGE FOR IMPROVED RECEPTION

When you consider it necessary and if weather and circumstances permit, recommend that the aircraft maintain or increase level to improve communications, radar or DF reception.

NOTE—

Aircraft with high-bypass turbofan engines (such as B747) encountering volcanic ash clouds have experienced total loss of power to all engines. Damage to engines due to volcanic ash ingestion increases as engine power is increased, therefore, climb while in the ash cloud is to be avoided where terrain permits.

9-2-5 EMERGENCY SITUATIONS

Consider that an aircraft emergency exists and inform the ACC for relay to the NRCC when:

NOTE—

If military aircraft are involved, an air traffic controller shall report to the appropriate authority according to military/civil LOA.

a. An emergency is declared by either:

   1. The pilot.

   2. Unit personnel.

   3. Officials responsible for the operation of the aircraft.

b. There is unexpected loss of radar contact and radio communications with any IFR or VFR aircraft.

c. Reports indicate it has made a forced landing, is about to do so, or its operating efficiency is so impaired that a forced landing will be necessary.

d. Reports indicate the crew has abandoned the aircraft or is about to do so.

e. An emergency radar beacon response is received.

   NOTE—

   For ACC or TCC automation system, Code 7700 causes EMRG (or EM) to blink in the data block.

f. Intercept or escort aircraft services are required.

g. The need for ground rescue appears likely.

h. An Emergency Locator Transmitter (ELT) signal is heard or reported.

   REFERENCE—

   PROVIDING ASSISTANCE, Para 9-1-3.

   EMERGENCY LOCATOR TRANSMITTER (ELT) SIGNALS, Para 9-2-13.

9-2-6 HIJACKED AIRCRAFT

When you observe a Mode 3/A Code 7500, an unexplained loss of beacon code, change in direction of flight or level, and/or a loss of communications, notify supervisory personnel immediately. As it relates to observing a Code 7500, do the following:

NOTE—

①. Military units will notify the ACC of any indication that an aircraft is being hijacked. They will also provide full cooperation with the civil agencies in the control of such aircraft.

② During ATMS operations, Code 7500 causes HJ emergency alarm with audio alert and color box surrounding the track label and EFS.

③ Only nondiscrete Code 7500 will be decoded as the hijack code.

a. Acknowledge and confirm receipt of Code 7500 by asking the pilot to verify it. If the aircraft is not being subjected to unlawful interference, the pilot should respond to the query by broadcasting in the clear that he is not being subjected to unlawful interference. If the reply is in the affirmative or if no reply is received, do not question the pilot further but be responsive to the aircraft requests.

PHRASEOLOGY:

(Aircraft Ident) (name of unit) CONFIRM SQUAWK 7500

NOTE—

Code 7500 is only assigned upon notification from the pilot that his aircraft is being subjected to unlawful interference. Therefore pilots have been requested to refuse the assignment of Code 7500 in any other situation and to inform the controller accordingly.

b. Transmit and continue to transmit, information pertinent to the safe conduct of flight, without expecting a reply from the aircraft.

c. Notify supervisory personnel who should in turn notify the operator or its representative, the appropriate NRCC in accordance with alerting procedures, and, the designated security authority.

d. Flight follow aircraft and use normal handoff procedures without requiring transmissions or responses by aircraft unless communications have been established by the aircraft.

e. If aircraft are dispatched to escort the hijacked aircraft, provide all possible assistance to the escort aircraft to aid in placing them in a position behind the hijacked aircraft.

REFERENCE—

CODE MONITOR, Para 5-2-8

9-2-7 AIRCRAFT BOMB THREATS

a. When information is received from any source that a bomb has been placed on, in, or near an aircraft for the purpose of damaging or destroying such aircraft, notify your supervisor or the unit air traffic manager. If the threat is general in nature, handle it as a “Suspicious Activity”, when the threat is targeted against a specific aircraft and you are in contact with the suspect aircraft take the following actions as appropriate:

NOTE—

① Unit supervisors are expected to notify the appropriate office, agencies, operators/ air carriers according to applicable plans, directives, and military directives.

② A “specific” threat may be directed to an aircraft registry or tail number, the air carrier flight number, the name of an operator, crew member or passenger, the departure/ arrival point or times, or combinations thereof.

1. Advise the pilot of the threat.
2. Inform the pilot that technical assistance can be obtained from the unit concerned.
3. Ask the pilot if he desires to climb or descend to a level that would equalize or reduce the outside air pressure/ existing cabin air pressure differential. Issue or relay an appropriate clearance considering MEA, MRA, and weather.

   NOTE—

   Equalizing existing cabin air pressure with outside air pressure is a key step which the pilot may wish to take to minimize the damage potential of a bomb.

4. Handle the aircraft as an emergency and/or provide the most expeditious handling possible with respect to the safety of other aircraft, ground facilities, and personnel.

   NOTE—

Emergency handling is discretionary and should be based on the situation. With certain types of threats, plans may call for a low-key action or response.

5. Issue or relay clearances to a new destination if requested.
6. When a pilot requests technical assistance or if it is apparent that a pilot may need such assistance, do NOT suggest what actions the pilot should take concerning a bomb, but obtain the following information and notify your supervisor:

NOTE—
This information is needed by the unit concerned so that he can assess the situation and make immediate recommendations to the pilot. The Aviation Explosives Expert may not be familiar with all military aircraft configurations but he can offer technical assistance which would be beneficial to the pilot.

(a) Type, series, and model of the aircraft.

(b) Precise location/ description of the bomb device if known.

(c) Other details which may be pertinent.

NOTE—
The following details may be of significance if known, but it is not intended that the pilot should disturb a suspected bomb/bomb container to ascertain the information; the level or time set for the bomb to explode, type of detonation action (barometric, time, anti-handling, remote radio transmitter), power source (battery, electrical, mechanical), type of initiator (blasting cap, flashing bulb, chemical) and the type of explosive/ incendiary charge (dynamite, black powder, chemical).

b. When a bomb threat involves an aircraft on the ground and you are in contact with the suspect aircraft take the following actions in addition to those discussed in the preceding paragraph which may be appropriate:

1. If the aircraft is at an aerodrome where tower control service is not available, or if the pilot ignores the threat at any aerodrome, recommend that takeoff be delayed until the pilot or aircraft operator establishes that a bomb is not aboard. If the pilot insists on taking off and in your opinion the operation will not adversely affect other traffic, issue or relay an ATC clearance.
2. Advise the aircraft to remain as far away from other aircraft and facilities as possible, to clear the runway, if appropriate, and to taxi to an isolated or designated search area. When it is impractical or if the pilot takes an alternative action; e.g. parking and off-loading immediately, advise other aircraft to remain clear of the suspect aircraft by at least 100 meters if able.

NOTE—
Passenger deplaning may be of paramount importance and must be considered before the aircraft is parked or moved away from service areas. The decision to use ramp facilities rests with the pilot, aircraft operator/ aerodrome manager.

c. If you are unable to inform the suspect aircraft of a bomb threat or if you lose contact with the aircraft, advise your supervisor and relay pertinent details to other sectors or units as deemed necessary.

d. When a pilot reports the discovery of a bomb or suspected bomb on an aircraft which is airborne or on the ground, determine the pilot's intentions and comply with his requests in so far as possible. Take all of the actions discussed in the preceding paragraphs which may be appropriate under the existing circumstances.

e. The handling of aircraft when a hijacker has or is suspected of having a bomb requires special considerations. Be responsive to the pilot's requests and notify supervisory personnel. Apply hijacking procedures and offer assistance to the pilot according to the preceding paragraphs, if needed.

9-2-8 STRAYED OR UNIDENTIFIED AIRCRAFT

NOTE—

① The terms "strayed aircraft" and "unidentified aircraft" in this paragraph have the following meanings:
(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 identity has not been established.

② *An aircraft may be considered, at the same time, as a "strayed aircraft" by one unit and as an "unidentified aircraft" by another unit.*

③ *A strayed or unidentified aircraft may be suspected as being the subject of unlawful interference.*

a. As soon as an air traffic services unit becomes aware of a strayed aircraft, it shall take all necessary steps as follows to assist the aircraft and to safeguard its flight.

NOTE—

Navigational assistance by an air traffic services unit is particularly important if the unit becomes aware of an aircraft straying, or about to stray, into an area where there is a risk of interception or other hazard to its safety.

1. If the aircraft's position is not known, the air traffic services unit shall:

   (a) Attempt to establish two-way communication with the aircraft, unless such communication already exists;

   (b) Use all available means to determine its position;

   (c) Inform other ATS units into whose area the aircraft may have strayed or may stray, taking into account all the factors which may have affected the navigation of the aircraft in the circumstances;

   (d) Inform, in accordance with locally agreed procedures, appropriate military units and provide them with pertinent flight plan and other data concerning the strayed aircraft;

   (e) Request from the units referred to in c) and d) and from other aircraft in flight every assistance in establishing communication with the aircraft and determining its position.

2. When the aircraft's position is established, the air traffic services unit shall:

   (a) Advise the aircraft of its position and corrective action to be taken; and

   (b) Provide, as necessary, other ATS units and appropriate military units with relevant information concerning the strayed aircraft and any advice given to that aircraft.

b. As soon as an air traffic services unit becomes aware of an unidentified aircraft in its area, it shall endeavour to establish the identity of the aircraft whenever this is necessary for the provision of air traffic services or required by the appropriate military authorities in accordance with locally agreed procedures. To this end, the air traffic services unit shall take such of the following steps as are appropriate in the circumstances:

1. Attempt to establish two-way communication with the aircraft;

2. Inquire of other air traffic services units within the FIR about the flight and request their assistance in establishing two-way communication with the aircraft;

3. Inquire of air traffic services units serving the adjacent FIRs about the flight and request their assistance in establishing two-way communication with the aircraft;

4. Attempt to obtain information from other aircraft in the area.

5. The air traffic services unit shall, as necessary, inform the appropriate military unit as soon as the identity of the aircraft has been established.

c. Should the ATS unit consider that a strayed or unidentified aircraft may be the subject of unlawful interference, the appropriate authority designated by the State shall immediately be informed, in accordance with locally agreed procedures.

9-2-9 EMERGENCY DESCENT

a. Upon receipt of advice that an aircraft is making an emergency descent through other traffic, all possible action shall be taken immediately to safeguard all aircraft concerned. When deemed necessary, air traffic control units shall immediately broadcast by means of the appropriate radio aids, or if not possible, request the appropriate communications stations immediately to broadcast an emergency message.

NOTE—
It is expected that aircraft receiving such a broadcast will clear the specified areas and stand by on the appropriate radio frequency for further clearances from the air traffic control unit.

b. Immediately after such an emergency broadcast has been made the ACC, the approach control unit, or the aerodrome control tower concerned shall forward further clearances to all aircraft involved as to additional procedures to be followed during and subsequent to the emergency descent. The ATS unit concerned shall additionally inform any other ATS units and control sectors which may be affected.

PHRASEOLOGY:

ATTENTION ALL AIRCRAFT IN THE VICINITY OF (or AT) (significant point or location) EMERGENCY DESCENT IN PROGRESS FROM (level) (followed as necessary by specific instructions, clearances, traffic information, etc.).

9-2-10 VFR AIRCRAFT IN WEATHER DIFFICULTY

a. A VFR aircraft reporting that it is uncertain of its position, or lost, or experiencing adverse meteorological conditions, shall be considered to be in a state of emergency. If the pilot requests assistance, request the aircraft to contact the appropriate control unit. Inform that unit of the situation. If the aircraft is unable to communicate with the control unit, relay information and clearances.

b. The following shall 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 Terrain Obstacle Hazard and Airspace Protection (TOHAP/MSAW) alarm processing.

9-2-11 ATS SURVEILLANCE ASSISTANCE TO VFR AIRCRAFT IN WEATHER DIFFICULTY

a. If a VFR aircraft request ATS surveillance assistance when it encounters or is about to encounter IFR weather conditions, take whichever of the following actions appropriate:

   1. Provide basic ATS surveillance service in accordance with paragraph 7-5-1 APPLICATION; or

   2. Issue appropriate IFR clearance to destination aerodrome.

b. If the pilot states he is not qualified for or not capable of conducting IFR flight, inform the pilot of aerodromes where VFR conditions are reported, other available pertinent weather information, and the available appropriate/published minimum safe altitude, e.g. minimum vectoring altitude or published minimum safe altitude near the aerodrome.

9-2-12 ATS SURVEILLANCE ASSISTANCE TECHNIQUES

Use the following techniques to the extent possible when you provide ATS surveillance assistance to a VFR pilot not qualified to operate in IFR conditions or who is lost:

a. Avoid radio frequency changes except when necessary to provide a clear communications channel.

b. Provide ATS surveillance assistance only upon the request or concurrence of the pilot.

c. Make turns while the aircraft is in VFR conditions so it will be in a position to fly a straight track while in IFR conditions.

d. Have pilot lower gear and slow aircraft to approach speed while in VFR conditions.

e. Avoid requiring a climb or descent while in a turn if in IFR conditions.

f. Avoid abrupt maneuvers.

g. Vector aircraft to VFR conditions.

h. The following shall 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 Terrain Obstacle Hazard and Airspace Protection (TOHAP/ MSAW) alarm processing.

9-2-13 EMERGENCY LOCATOR TRANSMITTER (ELT) SIGNALS

When an ELT signal is heard or reported:

a. ***EN ROUTE****:* Notify the National Rescue Coordination Center (NRCC).

b. ***TERMINAL****:* Notify the ACC.

NOTE—

① *Operational ground testing of Emergency Locator Transmitters (ELT's) has been authorized during the first 5 minutes of each hour. To avoid confusing the tests with an actual alarm, the testing is restricted to no more than three audio sweeps.*

② *Controllers can expect pilots to report aircraft position and time the signal was first heard, aircraft position and time the signal was last heard, aircraft position at maximum signal strength, flight level, and frequency of the emergency signal (121.5/243.0)*

c. Attempt to obtain fixes or bearings on the signal.

d. Solicit the assistance of other aircraft known to be operating in the signal area.

e. ***TERMINAL:*** Forward fixes or bearings and any other pertinent information to the ACC.

NOTE—
Fix information in relation to a VOR or VORTAC (radial-distance) facilitates accurate ELT plotting by NRCC and should be provided when possible.

f. ***EN ROUTE****:* When the ELT signal strength indicates the signal may be emanating from somewhere on an aerodrome or vicinity thereof, notify the ATC units concern for their actions. This action is in addition to the above.

g. ***TERMINAL:*** When the ELT signal strength indicates the signal may be emanating from somewhere on an aerodrome or vicinity thereof, notify the ACC for their action. This action is in addition to the above.

h. Air Traffic personnel shall not leave their required duty stations to locate an ELT signal source.

i. ***EN ROUTE****:* Notify the NRCC if signal source is located/terminated.

j. ***TERMINAL****:* Notify the ACC if signal source is located/terminated.

REFERENCE—
RESPONSIBILITY, Para 9-1-4.
INFORMATION REQUIREMENTS, Para 9-2-1.

9-2-14 EMERGENCY AERODROME RECOMMENDATION

Consider the following factors when recommending an emergency aerodrome:

a. Remaining fuel in relating to aerodrome distances.

b. Weather conditions.

NOTE—
Depending on the nature of the emergency, certain weather phenomena may deserve weighted consideration when recommending an aerodrome, e.g. A pilot may elect to fly farther to land at an aerodrome with VFR instead of IFR conditions.

c. Aerodrome conditions.

d. NAVAID status.

e. Aircraft type.

f. Pilot's qualifications.

g. Vectoring or homing capability to the emergency aerodrome.

9-2-15 GUIDANCE TO EMERGENCY AERODROME

When necessary, use any of the following for guidance to the aerodrome:

a. Radar.

b. Following another aircraft.

c. NAVAID's.

d. Pilotage by landmarks.

e. Compass headings.

9-2-16 VOLCANIC ASH

a. If a volcanic ash cloud is known or forecast to be present:

   1. Relay all information available to pilots to ensure that they are aware of the ash cloud's position and level(s).

   2. Suggest appropriate reroutes to avoid the area of known or forecast ash clouds.

      NOTE—
      Volcanic ash clouds are not normally detected by airborne or air traffic radar systems.

b. If advised by an aircraft that it has entered a volcanic ash cloud and indicates that a distress situation exists:

   1. Consider the aircraft to be in an emergency situation.

   2. Do not initiate any climb clearances to turbine powered aircraft until the aircraft has exited the ash cloud.

   3. Do not attempt to provide escape vectors without pilot concurrence.

      NOTE—
      ① *The recommended escape maneuver is to reverse track and begin a descent (if terrain permits). However it is the pilot's responsibility to determine the safest escape route from the ash cloud.*
      ② *Controllers should be aware of the possibility of complete loss of power to any turbine powered aircraft that encounters an ash cloud.*

REFERENCE—
LEVEL CHANGE FOR IMPROVED RECEPTION, Para. 9-2-4.

Section 3. OVERDUE AIRCRAFT

9-3-1 OVERDUE AIRCRAFT

a. Advise approach control or the ACC as appropriate if an aircraft fails to report after having been transferred to an aerodrome control tower, or, having once reported, ceases radio contact and in either case, fails to land 5 minutes after the expected landing time.

b. In other circumstances, consider an aircraft to be overdue and initiate the procedures stated in this section when neither communications nor radar contact can be established with it and 30 minutes have passed since:

NOTE—
The procedures in this section also apply to an aircraft referred to as "missing" or "unreported".

1. Its ETA over a specified or compulsory reporting point or at a clearance limit in your area.
2. Its clearance void time.

c. If you have reason to believe that an aircraft is overdue prior to 30 minutes, take the appropriate action immediately.

d. The center in whose area the aircraft is first unreported or overdue will make these determinations and takes any subsequent action required.

REFERENCE—
DEPARTURE RESTRICTIONS, CLEARANCE VOID TIMES, HOLD FOR RELEASE AND RELEASE TIMES, Para 4-3-3.

9-3-2 INFORMATION TO BE FORWARDED TO ACC

TERMINAL

When an aircraft is considered to be in emergency status that may require SAR procedures, or an IFR aircraft is overdue, the terminal unit shall alert the ACC and forward the following information as available:

a. Flight plan, including color of aircraft, if known.

b. Time of last transmission received, by whom, and frequency used.

c. Last position report and how determined.

d. Action taken by reporting unit and proposed action.

e. Number of persons on board.

f. Fuel status.

g. Unit working aircraft and frequency.

h. Last known position, estimated present position, and maximum range of flight of the aircraft based on remaining fuel and airspeed.

i. Position of other aircraft near aircraft's route of flight, when requested.

j. Whether or not an ELT signal has been heard or reported in the vicinity of the last known position.

k. Other pertinent information.

REFERENCE—
RESPONSIBILITY, Para 9-1-4.
EMERGENCY SITUATIONS, Para 9-2-5.

9-3-3 INFORMATION TO BE FORWARDED TO NATIONAL RESCUE COMMAND CENTER

EN ROUTE

When an aircraft is considered to be in emergency status or an IFR aircraft is overdue, the ACC shall alert the National Rescue Command Center and forward the following information as available:

a. Unit and person calling.

b. Flight plan, including color of aircraft, if known.

c. Time of last transmission received, by whom, and frequency used.

d. Last position report and how determined.

e. Action taken by reporting unit and proposed action.

f. Number of persons on board.

g. Fuel status.

h. Unit working aircraft and frequency.

i. Last known position, estimated present position, and maximum range of night of the aircraft based on remaining fuel and airspeed.

j. Position of other aircraft near aircraft's route of flight, when requested.

k. Whether or not an ELT signal has been heard or reported in the vicinity of the last known position.

l. Other pertinent information.

REFERENCE—

RESPONSIBILITY, Para 9-1-4.

EMERCENCY SITUATIONS, Para 9-2-5.

9-3-4 NOTIFICATION OF NATIONAL RESCUE COMMAND CENTER

a. Without prejudice to any other circumstances that may render such notification advisable, air traffic services units shall, except as prescribed in Para. 9-2-5, notify National Rescue Command Center immediately an aircraft is considered to be in a state of emergency in accordance with the following:

1. Uncertainty phase when:

a) No communication has been received from an aircraft within a period of 30 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 when

b) An aircraft fails to arrive within t30 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.

2. Alert phase when:

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, or when

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, or when

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 when

d) An aircraft is known or believed to be the subject of unlawful interference.

3. Distress phase when:

a) Following the alert phase, further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the aircraft is in distress, or when

b) The fuel on board is considered to be exhausted, or to be insufficient to enable the aircraft to reach safety, or when

c) 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 when

d) Information is received or it is reasonably certain that the aircraft is about to make or has made a forced landing, except when there is reasonable certainty that the aircraft and its occupants are not threatened by grave and imminent danger and do not require immediate assistance.

b. The notification shall contain such of the following information as is available in the order listed:

1. INCERFA, ALERFA or DETRESFA, as appropriate to the phase of the emergency;
2. Agency and person calling;
3. Nature of the emergency;
4. Significant information from the flight plan;
5. Unit which made last contact, time and means used;
6. Last position report and how determined;
7. Color and distinctive marks of aircraft;
8. Dangerous goods carried as cargo;
9. Any action taken by reporting office; and
10. Other pertinent remarks.

NOTE—

Such part of the information specified above, which is not available at the time notification is made to a rescue coordination centre, should be sought by an air traffic services unit prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.

c. Further to the notification, the rescue coordination centre shall, without delay, be furnished with:

1. Any useful additional information, especially on the development of the state of emergency through subsequent phases; or
2. Information that the emergency situation no longer exists.

NOTE—

The cancellation of action initiated by the rescue coordination centre is the responsibility of that centre.

9-3-5 AIRCRAFT POSITION PLOTS

a. When a state of emergency is considered to exist, the flight of the aircraft involved shall be plotted on a chart in order to determine the probable future position of the aircraft and its maximum range of action from its last known position. The flights of other aircraft known to be operating in the vicinity of the aircraft involved shall also be plotted in order to determine their probable future positions and maximum endurance.

b. Forward this information to the NRCC or the ACC as appropriate.

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Section 4. COMMUNICATIONS FAILURE – CONTROLLER ACTIONS

9-4-1 COMMUNICATIONS FAILURE

a. Action by air traffic control units when unable to maintain two-way communication with an aircraft operating in a control area or control zone shall be as outlined in the paragraphs which follow.

b. As soon as it is known that two-way communication has failed, action shall be taken to ascertain whether the aircraft is able to receive transmissions from the air traffic control unit by requesting it to execute a specified maneuver which can be observed by radar or to transmit, if possible, a specified signal in order to indicate acknowledgement.

c. If the aircraft fails to indicate that it is able to receive and acknowledge transmissions, separation shall be maintained between the aircraft having the communication failure and other aircraft, based on the assumption that the aircraft will:

1. If in visual meteorological conditions:

a) Continue to fly in visual meteorological conditions;

b) Land at the nearest suitable aerodrome; and

c) Report its arrival by the most expeditious means to the appropriate air traffic control unit; or

2. 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:

a) Unless otherwise prescribed on the basis of a regional air navigation agreement, in airspace where radar is not 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 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,

b) In airspace where radar 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:

1) The time the last assigned level or minimum flight altitude is reached; or

2) The time the transponder is set to Code 7600; or

3) The aircraft's failure to report its position over a compulsory reporting point;

4) Whichever is later and thereafter adjust level and speed in accordance with the filed flight plan;

c) When being radar 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;

d) 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 e) below, hold over this aid or fix until commencement of descent;

e) Commence descent from the navigation aid or fix specified in d) 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;

f) Complete a normal instrument approach procedure as specified for the designated navigation aid or fix; and

g) Land, if possible, within 30 minutes after the estimated time of arrival specified in e) or the last acknowledged expected approach time, whichever is later.

d. Action taken to ensure suitable separation shall cease to be based on the assumption stated in c. when:

1. It is determined that the aircraft is following a procedure differing from that in c.; or

2. Through the use of electronic or other aids, air traffic control units determine that action differing from that required by c. may be taken without impairing safety; or
3. Positive information is received that the aircraft has landed.

e. As soon as it is known that two-way communication has failed, appropriate information describing the action taken by the air traffic control unit, or instructions justified by any emergency situation, shall be transmitted blind for the attention of the aircraft concerned, on the frequencies available on which the aircraft is believed to be listening, including the voice frequencies of available radio navigation or approach aids. Information shall also be given concerning:
   1. Meteorological conditions favorable to a cloud-breaking procedure in areas where congested traffic may be avoided; and
   2. Meteorological conditions at suitable aerodromes.

f. Pertinent information shall be given to other aircraft in the vicinity of the presumed position of the aircraft experiencing the failure.

g. As soon as it is known that an aircraft which is operating in its area of responsibility is experiencing an apparent radio communication failure, an air traffic services unit shall forward information concerning the radio communication failure to all air traffic services units concerned along the route of flight. The ACC in whose area the destination aerodrome is located shall take steps to obtain information on the alternate aerodrome(s) and other relevant information specified in the filed flight plan, if such information is not available.

h. If circumstances indicate that a controlled flight experiencing a communication failure might proceed to (one of) the alternate aerodrome(s) specified in the filed flight plan, the air traffic control unit(s) serving the alternate aerodrome(s) and any other air traffic control units that might be affected by a possible diversion shall be informed of the circumstances of the failure and requested to attempt to establish communication with the aircraft at a time when the aircraft could possibly be within communication range. This shall apply particularly when, by agreement with the operator or a designated representative, a clearance has been transmitted blind to the aircraft concerned to proceed to an alternate aerodrome, or when meteorological conditions at the aerodrome of intended landing are such that a diversion to an alternate is considered likely.

i. When an air traffic control unit receives information that an aircraft, after experiencing a communication failure has re-established communication or has landed, that unit shall inform the air traffic services unit in whose area the aircraft was operating at the time the failure occurred, and other air traffic services units concerned along the route of flight, giving necessary information for the continuation of control if the aircraft is continuing in flight.

j. If the aircraft has not reported within 30 minutes after:
   1. The estimated time of arrival furnished by the pilot;
   2. The estimated time of arrival calculated by the ACC; or
   3. The last acknowledged expected approach time,

   whichever is latest, pertinent information concerning the aircraft shall be forwarded to aircraft operators, or their designated representatives, and pilots-in-command of any aircraft concerned and normal control resumed if they so desire. It is the responsibility of the aircraft operators, or their designated representatives, and pilots-in-command of aircraft to determine whether they will resume normal operations or take other action.

PHRASEOLOGY:

REPLY NOT RECEIVED (appropriate instructions)

(Action) OBSERVED (additional instructions/information as necessary)

9-4-2 LIGHTING REQUIREMENTS

a. ***EN ROUTE*:** At non-tower locations, request the aerodrome management to light all runway lights,

approach lights, and all other required aerodrome lighting systems for at least 30 minutes before the ETA of the unreported aircraft until the aircraft has been located or for 30 minutes after its fuel supply is estimated to be exhausted.

b. ***TERMINAL***: Operate runway lights, approach lights, and all other required aerodrome lighting systems for at least 30 minutes before the ETA of the unreported aircraft until the aircraft has been located or for 30 minutes after its fuel supply is estimated to be exhausted.

REFERENCE—
EM ERGENCY LIGHTING, Para 3-4-1

9-4-3 RESUMPTION OF OPERATIONS

Advise aircraft operators, or their designated representatives, and pilots-in-command of any aircraft concerned, and resume normal control if they so desire, after the expiry of the period of traffic suspension calculated in accordance with 9-4-2 b.

NOTE—

It is the responsibility of the aircraft operators, or their designated representatives, and pilots-in-command of aircraft to determine whether they will resume normal operations or take other action.

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Section 5. ATS SURVEILLANCE SYSTEM FAILURE

9-5-1 ATS SURVEILLANCE FAILURE

a. In the event of complete failure of the ATS surveillance equipment except for air-ground communications, the controller shall:

1. Plot the positions of all aircraft already identified and take the necessary action to establish non radar separation between the aircraft; and when relevant:
2. Request the appropriate controller to assume control of the traffic affected.

b. As an emergency measure, use of flight levels spaced by half the applicable vertical separation minimum may be resorted to temporarily if standard non-radar separation cannot be provide immediately.

c. Except when there is assurance that the complete ATS surveillance equipment failure will be of a very limited duration, steps should be taken to limit the number of aircraft permitted to enter the area to that which can be safely handled without the use of ATS surveillance.

PHRASEOLOGY:

ATS SURVEILLANCE SYSTEM OUT OF SERVICE (appropriate information as necessary)

d. Where the provisions in a. are not applicable, the controller shall:

1. without delay inform all adjacent control positions or ATC units, as applicable, of the failure;
2. appraise such positions or units of the current traffic situation;
3. request their assistance, in respect of aircraft which may establish communications with those positions or units, in establishing ATS surveillance or non-radar separation between and maintaining control of such aircraft; and
4. instruct adjacent control positions or ATC units to hold or reroute all controlled flights outside the area of responsibility of the position or ATC unit that has experienced the failure until such time that the provision of normal services can be resumed.

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Section 6. IN-FLIGHT CONTINGENCIES

9-6-1 WEATHER DEVIATION

a. When the pilot initiates communications with ATC, a rapid response may be obtained by stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response. When necessary, the pilot should initiate the communications using the urgency call "PAN PAN" (preferably spoken three times).

b. The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to its cleared route.

c. The pilot should notify ATC and request clearance to deviate from track, advising, when possible, the extent of the deviation expected. ATC should take one of the following actions:

a) When appropriate separation can be applied, issue clearance to deviate from track; or

b) If there is conflicting traffic and ATC is unable to establish appropriate separation, ATC shall:

1) Advise the pilot of inability to issue clearance for the requested deviation;

2) Advise the pilot of conflicting traffic; and

3) Request the pilot's intentions.

PHRASEOLOGY:

UNABLE, TRAFFIC (DIRECTION) BOUND (TYPE OF AIRCRAFT) (LEVEL) ESTIMATED (OR OVER) (SIGNIFICANT POINT) AT (TIME) CALL SIGN (CALL SIGN) ADVISE INTENTIONS.

EXAMPLE:

"Cathy 510, unable, traffic eastbound, Boeing seven four seven, flight level three one zero, estimated over KADLO at zero four three seven, call sign EVA68, advise intentions."

NOTE—

① The pilot should take the following actions:

a. Comply with the ATC clearance issued; or

b. Advise ATC of intentions and execute the procedures.

② Letter of Agreement will be applied if military and CAA has signed it, and followed the procedures.

9-6-2 EXPLOSIVE CARGO

TERMINAL

When you receive information that an emergency landing will be made with explosive cargo aboard, inform the pilot of the safest or least congested aerodrome areas.

Relay the explosive cargo information to:

a. The emergency equipment crew.

b. The aerodrome management.

c. The appropriate military agencies when requested by the pilot.

9-6-3 RECORDING OF NON-SYSTEM TRAFFIC

Information received on actual progress of flights, including those of heavy or medium unmanned free balloons under neither air traffic control nor flight information service shall be:

a. Recorded by the air traffic services unit servicing the FIR, for the purpose of search and rescue, if

requested.

b. Transmitted to adjacent air traffic services units concerned in accordance with any agreements which are in place.

Chapter 10. FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) SERVICES

Section 1. INTRODUCTION

NOTE—

The implementers of the Flight and Flow — Information for a Collaborative Environment (FF-ICE) services are not exempted from fulfilling requirements to exchange flight plan and other associated movement messages with operators and ATS units that have not implemented FF-ICE services.

10-1-1 FF-ICE SERVICES SCOPE

The FF-ICE services may include any of the following:

a. planning service: the evaluation of a preliminary flight plan (PFP) with respect to flight plan acceptability and, where practicable, the indication of applicable restrictions and resultant constraints on the flight;

b. filing service: the evaluation of a filed flight plan (eFPL) for the provision of air traffic services and indication of flight plan acceptability;

c. trial service: the evaluation of a trial request with respect to flight plan acceptability and, where practicable, the indication of applicable restrictions and resultant constraints on the flight;

NOTE—

The trial service offers an opportunity for an operator or designated representative to submit "what-if" scenarios and to receive feedback from an FF-ICE services unit, prior to submitting a PFP, eFPL or flight plan update.

d. flight data request service: the provision of data regarding a specific flight such as the latest version of a filed flight plan or search and rescue data upon request by an eligible recipient;

e. notification service: the provision of data regarding a certain flight event such as departure and arrival to required recipients; and

f. publication service: the publication of flight and flow data for access by authorized subscribers.

NOTE—

Further details on the restrictions and constraints can be found in the Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE) (ICAO Doc 9965).

10-1-2 APPLICATION OF PROVISIONS

When any of the FF-ICE services in 10-1-1 are to be implemented, the provision and use of such services shall be effected in accordance with the provisions of this chapter.

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Section 2. GENERAL PROVISIONS

10-2-1 ATS AUTHORITY RESPONSIBILITIES

When it has been determined that FF-ICE services will be provided, the appropriate ATS authority shall:

a. designate at least one FF-ICE services unit;

b. arrange for, as a minimum, the provision of the filing service and flight data request service;

c. ensure that the FF-ICE services unit(s) maintains the ability necessary to exchange ATS messages with operators and ATS units that have not implemented FF-ICE services; and

d. arrange for the promulgation of information on the availability of FF-ICE services, associated procedures and conditions in the Aeronautical Information Publications (AIP).

10-2-2 AIP PUBLICATION REQUIREMENTS

The associated procedures and conditions to be published in the AIP shall include, inter alia, the following:

a. instructions for constructing valid flight plans for submission (10-4-1 a. and 10-4-1 b. refer);

b. the point in time and/or conditions after which procedures change for submission of a Flight Plan Update message (10-4-4 a. refers);

c. if applicable, the period of time and point in time and/or conditions under which an update to the Planning Status and Filing Status messages is provided (10-4-5 b. refers);

d. if applicable, the types of flight data that can be requested via the FF-ICE flight data request service (10-4-7 a. refers); and

e. if applicable, the time limits for submission of a PFP message (10-4-2 c. refers).

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Section 3. FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) MESSAGES

10-3-1 MESSAGE USAGE

The messages prescribed in Table 10-1 shall be used to exchange information as indicated in the procedures or FF-ICE services in 10-4.

10-3-2 INTEROPERABILITY COMPLIANCE

FF-ICE messages shall comply with the technical and interoperability requirements contained in 10-5.

10-3-3 MESSAGE TRANSLATION

The content of an FF-ICE message shall allow for translation to a corresponding ATS message. This includes the translation of:

a. an eFPL message to an FPL message;

b. a Flight Plan Update message to a CHG or DLA message; and

c. a Flight Cancellation message to a CNL message.

NOTE—

1. See also 10-2-1 c. concerning a required capability to support a mixed mode environment.

2. Additional data items defined for use in the FF-ICE messages that do not correspond to an existing data item in the ATS message may not be translated.

3. Information on data items requiring translation and guidance on the use of algorithms to minimize loss of data during translation are contained in the Manual on Flight and Flow — Information for a Collaborative Environment (ICAO Doc 9965).

10-3-4 DATA DISPLAY AND VERIFICATION

It is not the intention that personnel involved in the provision and use of the FF-ICE services see the whole content of FF-ICE messages, the majority of which are to be generated by computer systems. However, flight plan information shall be displayed or made available for verification, coordination and necessary modifications by those personnel, such as flight operations officer or flight data processing officer.

TABLE 10-1. STANDARD FLIGHT AND FLOW — INFORMATION FOR A COLLABORATIVE ENVIRONMENT (FF-ICE) MESSAGES (10-3-1 refers)

NOTE—

① The term "message" refers to a discrete unit of communication, expressed electronically, and intended for consumption by a recipient or group of recipients.

② Specific details on FF-ICE messages including content, format and data conventions are described in the Manual on Flight and Flow — Information for a Collaborative Environment (ICAO Doc 9965).

Message	Description
Submission Response	A response message indicating whether a submitted FF-ICE message is valid or not. In case of rejection, it also indicates the reason.
Preliminary Flight Plan (PFP)	A flight plan (to be) submitted for collaborative flight planning, prior to submitting a Filed Flight Plan (eFPL) message.
Planning Status	A response to a validated PFP message indicating the flight plan acceptability and, where practicable, applicable restrictions and constraints.

Trial Request	A query to evaluate a flight plan under consideration for an intended flight.
Trial Response	A response to a validated Trial Request message indicating the expected flight plan acceptability and, where practicable, applicable restrictions and constraints.
Filed Flight Plan (eFPL)	A flight plan (to be) submitted as a request for air traffic services.
Filing Status	A response to a validated eFPL message indicating the flight plan acceptability.
Flight Plan Update	An update to the information contained in a previously submitted flight plan (PFP or eFPL)
Flight Cancellation	An instruction to cancel and remove a previously submitted flight plan (PFP or eFPL)
Flight Data Request	A query for flight plan or search and rescue information for a particular flight.
Flight Data Response	A response to a validated Flight Data Request message, which includes the requested data.
Flight Departure	A notification that a flight has departed.
Flight Arrival	A notification that a flight has landed.

Section 4. PROCEDURES FOR FF-ICE SERVICES

10-4-1 GENERAL

NOTE—

Each FF-ICE service has an applicable set of messages and associated procedures, and some procedures are used by more than one service.

a. An originator shall ensure that an FF-ICE message complies with an applicable format and data conventions.

b. A recipient shall validate the FF-ICE message by checking its compliance with the applicable format and data conventions and to the extent possible, for completeness and accuracy.

c. Each recipient shall respond to each of the messages identified below with a Submission Response message as soon as practicable after validation of a message pursuant to b.:

1. Preliminary Flight Plan (PFP);
2. Filed Flight Plan (eFPL);
3. Flight Plan Update;
4. Trial Request;
5. Flight Cancellation;
6. Flight Departure;
7. Flight Arrival; and
8. Flight Data Request.

d. Upon receipt of a Submission Response indicating that the message has been rejected, the recipient of the Submission Response shall take action, as necessary.

e. The originator of PFP, eFPL or Flight Plan Update messages shall include flight plan version information that allows a recipient to verify that the flight plan version in the message is more recent than previously received, and that no incremental updates were missed.

f. When the flight plan version of a received message is older than the one currently held, or incremental updates are missing, the recipient shall take action to obtain the latest version of the flight plan.

10-4-2 PRELIMINARY FLIGHT PLAN (PFP)

a. The FF-ICE planning service shall be effected by the submission of a Preliminary Flight Plan (PFP) message by an operator or designated representative to each FF-ICE services unit from which evaluation is needed and that has indicated the availability of the service.

b. A PFP message shall include the following data items, as a minimum when first submitted, and be augmented as more information is available to the operator:

1. globally unique flight identifier (GUFI);
2. aircraft identification;
3. departure aerodrome;
4. estimated off-block date and time; and
5. destination aerodrome.

NOTE—

Provisions on the generation and use of a GUFI are contained in Aeronautical Telecommunications Procedures.

c. The time limits for submission of a PFP message determined by the appropriate ATS authority or on the basis of regional air navigation agreements shall be published in the AIP.

d. A PFP message shall be rejected if a filed flight plan exists for the given flight.

e. FF-ICE services units shall evaluate the validated PFP message and provide an appropriate response in accordance with 10-4-5.

f. Submission of a PFP message shall not substitute for the submission of an eFPL message.

10-4-3 FILED FLIGHT PLAN (eFPL)

a. The FF-ICE filing service shall be effected by the submission of a Filed Flight Plan (eFPL) message by an operator or designated representative.

b. Unless otherwise prescribed by the appropriate ATS authority, an operator or its designated representative electing to use FF-ICE services shall submit:

1. an eFPL to each FF-ICE services unit concerned along the route of a flight; and

2. an FPL to each ATS unit unable to process an eFPL, as directed by the AIP relevant to each airspace the flight is expected to traverse.

NOTE—

① When so prescribed, the FF-ICE service unit may optionally offer related functionality, for example: an operator or its designated representative may submit an eFPL only to an FF-ICE services unit serving the departure aerodrome. The FF-ICE services unit may assume responsibility for the provision of the flight plan information and changes thereto in an appropriate format to all relevant units concerned along the route of flight, and for provision of appropriate responses back to an operator or its designated representative.

② Acceptable methods for translating eFPL to FPL can be found in the Manual on Flight and Flow — Information for a Collaborative Environment (ICAO Doc 9965).

c. An eFPL message shall include, as a minimum, the GUFI and the flight data items prescribed by the provisions in Rules of the Air.

NOTE—

Provisions on the generation and use of a GUFI are contained in Aeronautical Telecommunications Procedures.

d. The FF-ICE services unit shall ensure that the filed flight plan is made available to all ATS units concerned within its area of responsibility.

e. When so required by the agreement between the appropriate ATS authorities to assist in the identification of flights and thereby eliminate or reduce the need for interceptions in the event of deviations from the assigned track, the FF-ICE services unit shall also provide an eFPL message to the FF-ICE services unit of each FIR or upper FIR in close proximity to specified routes or airspace the flight is expected to traverse.

f. The FF-ICE services units shall evaluate the validated filed flight plan and provide an appropriate response in accordance with 10-4-5.

10-4-4 FLIGHT PLAN UPDATE

a. An FF-ICE services unit shall publish in the AIP, pursuant to 10-2-2, the applicable conditions which cause the procedures for the submission of a Flight Plan Update message to change.

NOTE—

Depending on a local arrangement between an FF-ICE services unit and an ATS unit formulating ATC clearances, flight plan updates may not be accepted after a certain point of time, which is important information to operators.

b. When any change is to be made to a previously submitted flight plan (PFP or eFPL, as appropriate), an operator or designated representative shall submit a Flight Plan Update message to all the recipients of the previously submitted flight plan.

c. When such a change results in additional entities not previously having received the flight plan concerned, the operator or designated representative shall submit a latest version of the complete flight plan (PFP or eFPL, as appropriate), with all prior updates incorporated, to those recipients that are newly affected by the change.

d. When the submitted flight plan message (PFP or eFPL) includes a flight plan version number exactly one greater than the one currently held, the flight plan message shall be processed as an update to the previously submitted flight plan.

e. When a flight plan version number contained in a Flight Plan Update message is not exactly one greater than the one currently held, the Flight Plan Update message shall be rejected and the version mismatch shall be indicated to the operator.

f. When a rejection of a Flight Plan update message due to a version mismatch is received, the operator or designated representative shall submit the latest version of the complete flight plan (PFP or eFPL, as appropriate).

g. When a flight plan has been provided pursuant to 10-4-3 c. and d., the FF-ICE services unit shall keep those recipients informed of any changes to the filed flight plan including the case when, following a change, the flight is no longer of concern to the recipients.

h. Upon validation of a flight plan update message, the FF-ICE services units shall evaluate the update to the previously submitted flight plans and provide an appropriate response in accordance with 10-4-5.

10-4-5 FLIGHT PLAN EVALUATION

a. Each individual FF-ICE services unit shall determine the acceptability of the flight plan or flight plan update, and send an appropriate FF-ICE message (Planning Status message or Filing Status message) as soon as practicable. In case of the Planning Status message, it shall be sent no later than three hours before the estimated off blocks time.

NOTE—

1. Flight plan acceptability is determined based on a separate evaluation of semantics and the assessment of compliance with applicable restrictions and/or constraints.

2. The response messages resulted from the flight plan evaluation are additional to the Submission Response message provided pursuant to 10-4-1 c.

b. The FF-ICE services unit may wish to provide an update to the Planning Status or Filing Status in order to reflect changes in relevant restrictions or applicable flight constraints. In such cases, the period of time and/or conditions under which an update to the Planning Status and Filing Status messages is provided shall be published in the AIP pursuant to 10-2-2.

c. In response to the Planning Status or Filing Status message, the operator or designated representative shall evaluate the contents and take action as necessary.

10-4-6 FLIGHT CANCELLATION

a. To cancel a flight for which a preliminary or filed flight plan was previously submitted, an operator or designated representative shall submit a Flight Cancellation message to each FF-ICE services unit that was previously provided with the flight plan concerned.

b. Upon validation of a Flight Cancellation message, an FF-ICE services unit shall take necessary actions to ensure that the flight is not considered as an intended flight. Such actions may include, but are not limited to:

1. not accepting any further FF-ICE messages that include the GUFI of the cancelled flight;
2. notifying FF-ICE services units and/or ATS units that are aware of the flight; and
3. removing the flight from ATC systems.

c. When a previously cancelled flight needs to be re-established, a flight plan shall be submitted in the

same manner as it is for a new flight.

10-4-7 FLIGHT DATA REQUEST

a. An FF-ICE service unit may make available any information about a flight that is deemed useful, but as a minimum, shall be capable of providing the following information, when applicable, upon request:

   1. the most recent version of a preliminary flight plan;
   2. the most recent version of a filed flight plan;
   3. supplementary search and rescue information;
   4. the latest planning status; or
   5. the latest filing status.

b. To obtain flight plan information about a specific flight such as listed in 10-4-7 a., a Flight Data Request message shall be submitted to an appropriate FF-ICE services unit that has been identified as holding the desired information.

   NOTE—
   More use cases for the FF-ICE flight data request service can be found in the Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE) (ICAO Doc 9965).

c. A Flight Data Request message submitted by an operator or designated representative shall concern only a flight under its operational control.

d. An FF-ICE services unit shall validate whether the received Flight Data Request message originates from an entity eligible for requesting such information.

e. Upon validation of a Flight Data Request message, the FF-ICE services unit shall provide the requested flight data as soon as practicable.

f. When unable to provide the requested data, the FF-ICE services unit shall send a Submission Response Message - Reject and indicate the reasons for the inability to provide the requested data.

10-4-8 TRIAL REQUEST

a. The FF-ICE trial service shall be effected through the submission of a Trial Request message by an operator or designated representative to each FF-ICE services unit from which evaluation is needed and that has indicated provision of the service. A Trial Request message may be submitted to an FF-ICE services unit that was not along the original route of flight and did not previously receive the flight plan, in order to evaluate a reroute into the airspace for which the FF-ICE services unit is designated to serve.

b. Upon validation of a Trial Request message, an FF-ICE service unit shall, as soon as practicable, determine the acceptability of the potential changes to an intended flight, and send a Trial Response message.

c. The information contained in the Trial Request message shall not be used for the purpose of air traffic flow management or air traffic services.

10-4-9 NOTIFICATION

When it has been determined that the FF-ICE notification service will be used as a means to meet the requirements of transmitting the flight departure and arrival. The Flight Departure message and Flight Arrival message shall be used in lieu of DEP and ARR messages.

10-4-10 PUBLICATION

(To be developed)

Section 5. TECHNICAL AND INTEROPERABILITY REQUIREMENTS

10-5-1 USE OF INFORMATION SERVICES

FF-ICE services shall make use of information services.

NOTE—

1. In the context of system-wide information management (SWIM), the information service addresses machine-to-machine interaction in a service-oriented architecture.

2. Procedures on information services are contained in the Procedures for Air Navigation Services - Information Management (PANS-IM, ICAO Doc 10199).

10-5-2 INFORMATION EXCHANGE MODEL

The providers and users of the FF-ICE services shall adopt an information exchange model that:

a. provides the structure and format of the required flight and flow data elements, including their properties, associations and data types, and data value constraints;

b. enables the construction and exchange of the standard FF-ICE messages in Table 10-1; and

c. provides a mechanism by which additional flight and flow data and/or FF-ICE messages can be used without affecting global interoperability.

NOTE—
Details on the structure and format of the flight and flow data elements and FF-ICE messages are contained in the Manual on Flight and Flow — Information for a Collaborative Environment (FF-ICE) (ICAO Doc 9965).

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Appendix 1. PHRASEOLOGIES

1-1 ATC PHRASEOLOGIES

1-1-1 GENERAL

Circumstances	*Phraseologies*
1-1-1-1 **DESCRIPTION OF LEVELS (SUBSEQUENTLY REFERRED TO AS "*(LEVEL)*")**	a) FLIGHT LEVEL *(number)*; *or* b) *(number)* METERS; *or* c) *(number)* FEET.
1-1-1-2 **LEVEL CHANGES, REPORTS AND RATES**	a) CLIMB (*or* DESCEND); *followed as necessary by:*
	1) AND MAINTAIN *(level)*;
…instruction that a climb (or descent) to a level within the vertical range defined is to commence	2) TO AND MAINTAIN BLOCK *(level)* TO *(level);*
	3) TO REACH *(level)* AT (*or* BY) *(time or significant point)*;
	4) REPORT LEAVING (*or* REACHING, *or* PASSING) *(level)*;
	5) AT *(number)* METERS PER SECOND (*or* FEET PER MINUTE) [OR GREATER (*or* OR LESS)];
... for SST aircraft only	6) REPORT STARTING ACCELERATION (*or* DECELERATION).
	b) MAINTAIN AT LEAST *(number)* METERS (*or* FEET) ABOVE (*or* BELOW) *(aircraft call sign);*
	c) REQUEST LEVEL (*or* FLIGHT LEVEL *or* ALTITUDE) CHANGE FROM *(name of unit)* [AT *(time or significant point)*];
	d) STOP CLIMB (*or* DESCENT) AT *(level)*;
	e) CONTINUE CLIMB (*or* DESCENT) AND MAINTAIN *(level)*;
	f) EXPEDITE CLIMB (*or* DESCENT) [UNTIL PASSING *(level)*];
	g) WHEN READY CLIMB (*or* DESCEND) AND MAINTAIN *(level)*;
	h) EXPECT CLIMB (*or* DESCENT) AT *(time or significant point)*;
	*i) REQUEST DESCENT AT *(time)*;
... to require action at a specific time or place	j) IMMEDIATELY;
	k) AFTER PASSING (*significant point*);

Circumstances	*Phraseologies*
	l) AT (*time or significant point*);
... to require action when convenient	m) WHEN READY (*instruction*);
... to require an aircraft to climb or descend maintaining own separation and VMC	n) MAINTAIN OWN SEPARATION AND VMC [FROM (*level*)] [TO (*level*)]; o) MAINTAIN OWN SEPARATION AND VMC ABOVE (*or* BELOW, *or* TO) (*level*);
... when there is doubt that an aircraft can comply with a clearance or instruction	p) IF UNABLE (*alternative instructions*) AND ADVISE;
... when a pilot is unable to comply with a clearance or instruction	*q) UNABLE;
... after a flight crew starts to deviate from any ATC clearance or instruction to comply with an ACAS resolution advisory (RA) (Pilot and controller interchange)	*r) TCAS RA; s) ROGER;
... after the response to an ACAS RA is completed and a return to the ATC clearance or instruction is Initiated (Pilot and controller interchange)	*t) CLEAR OF CONFLICT, RETURNING TO (*assigned clearance*); u) ROGER (*or alternative instructions*);
... after the response to an ACAS RA is completed and the assigned ATC clearance or instruction has been resumed (Pilot and controller interchange)	*v) CLEAR OF CONFLICT (*assigned clearance*) RESUMED; w) ROGER;
... after an ATC clearance or Instruction contradictory to the ACAS RA is received, the flight crew will follow the RA and inform ATC directly (Pilot and controller interchange)	*x) UNABLE, TCAS RA; y) ROGER;
	* Denotes pilot transmission.
1-1-1-3 **TRANSFER OF CONTROL AND/OR FREQUENCY CHANGE** ***Note—*** *An aircraft may be requested to "STAND BY" on a frequency when it is intended that the ATS unit will initiate communications soon and to "MONITOR" a frequency when information is being*	a) CONTACT (unit call sign) (frequency) [NOW]; b) AT (or OVER) (time or place) [or WHEN] [PASSING/ LEAVING/REACHING] (level)] CONTACT (unit call sign) (frequency); c) IF NO CONTACT (instructions); d) STAND BY FOR (unit call sign) (frequency); *e) REQUEST CHANGE TO (frequency); f) FREQUENCY CHANGE APPROVED;

Circumstances	*Phraseologies*
broadcast thereon.	g) MONITOR (unit call sign) (frequency); *h) MONITORING (frequency); i) WHEN READY CONTACT (unit call sign) (frequency); j) REMAIN THIS FREQUENCY. * Denotes pilot transmission.
1-1-1-4 **RESERVED**	
1-1-1-5 **CHANGE OF CALL SIGN...** to instruct an aircraft to change its type of call sign ... to advise an aircraft to revert to the call sign indicated in the flight plan	a) CHANGE YOUR CALL SIGN TO (new call sign) [UNTIL FURTHER ADVISED]; b) REVERT TO FLIGH CALL SIGN (call sign) [AT (significant point)].
1-1-1-6 **TRAFFIC INFORMATION** ... to pass traffic information ... to acknowledge traffic information	a) TRAFFIC (information); b) NO REPORTED TRAFFIC; *c) LOOKING OUT; *d) TRAFFIC IN SIGHT; *e) NEGATIVE CONTACT [reasons]; f) [ADDITIONAL] TRAFFIC (direction) BOUND (type of aircraft) (level) ESTIMATED (or OVER) (significant point) AT (time); g) TRAFFIC IS (classification) UNMANNED FREE BALLOON(S) WAS [or ESTIMATED] OVER (place) AT (time) REPORTED (level(s)) [or LEVEL UNKNOWN] MOVING (direction) (other pertinent information, if any). * Denotes pilot transmission.
1-1-1-7 **METEOROLOGICAL CONDITIONS**	a) [SURFACE] WIND (number) DEGREES (speed) (units); b) WIND AT (level) (number) DEGREES (number) KILOMETERS PER HOUR (or KNOTS); ***Note.—*** *Wind is always expressed by giving the mean direction and speed and any significant variations thereof.* c) VISIBILITY (distance) (units) [direction]; d) RUNWAY VISUAL RANGE (or RVR) [RUNWAY (number)] (distance) (units); e) RUNWAY VISUAL RANGE (or RVR) RUNWAY (number) NOT

Circumstances	*Phraseologies*
	AVAILABLE (or NOT REPORTED);
... for multiple RVR observations	f) RUNWAY VISUAL RANGE (or RVR) [RUNWAY (number)] (first position) (distance) (units), (second position) (distance) (units), (third position) (distance) (units) ***Note*** *① Multiple RVR observations are always representative of the touchdown zone, midpoint zone and the roll-out/stop end zone, respectively.* *② Where reports for three locations are given, the indication of these locations may be omitted, provided that the reports are passed in the order of touchdown zone, followed by the midpoint zone and ending with the roll-out/stop end zone report.*
... in the event that RVR information on any one position is not available this information will be included in the appropriate sequence	g) RUNWAY VISUAL RANGE (or RVR) [RUNWAY (number)] (first position) (distance) (units), (second position) NOT AVAILABLE, (third position) (distance) (units);
	h) PRESENT WEATHER (details);
	i) CLOUD (amount, [(type)] and height of base) (units) (or SKY CLEAR);
	j) CAVOK; ***Note.—*** *CAVOK pronounced KAV-OH-KAY.*
	k) TEMPERATURE [MINUS] (number) (and/or DEW-POINT [MINUS] (number));
	l) QNH (number) [units];
	m) QFE (number) [(units)];
	n) (aircraft type) REPORTED (description) ICING (or TURBULENCE) [IN CLOUD] (area) (time);
	o) REPORT FLIGHT CONDITIONS.
1-1-1-8 **POSITION REPORTING**	a) NEXT REPORT AT (significant point);
... to omit position reports until a specified position	b) OMIT POSITION REPORTS [UNTIL (specify)];
	c) RESUME POSITION REPORTING.
1-1-1-9 **ADDITIONAL REPORTS**	a) REPORT PASSING (significant point);
... to request a report at a specified place or distance	b) REPORT (distance) FROM (name of DME station) DME (or significant point);
	c) REPORT PASSING (three digits) RADIAL (name of VOR) VOR;
... to request a report of present position	d) REPORT DISTANCE FROM (significant point);
	e) REPORT DISTANCE FROM (name of DME station) DME.

Circumstances	*Phraseologies*
1-1-1-10 **AERODROME INFORMATION**	a) [(location)] RUNWAY (number) SURFACE CONDITION [CODE (three digit number)] followed as necessary by: 1) ISSUED AT (date and time UTC); 2) DRY, or WET ICE, or WATER ON TOP OF COMPACTED SNOW, or DRY SNOW, or DRY SNOW ON TOP OF ICE, or WET SNOW ON TOP OF ICE, or ICE, or SLUSH, or STANDING WATER, or COMPACTED SNOW, or WET SNOW, or DRY SNOW ON TOP OF COMPACTED SNOW, or WET SNOW ON TOP OF COMPACTED SNOW, or WET, or FROST; 3) DEPTH ((depth of deposit) MILLIMETRES or NOT. REPORTED); 4) COVERAGE ((number) PERCENT or NOT REPORTED); 5) ESTIMATED SURFACE FRICTION (GOOD, or GOOD TO. MEDIUM, or MEDIUM, or MEDIUM TO POOR, or POOR, or LESS THAN POOR); 6) AVAILABLE WIDTH (number) METRES; 7) LENGTH REDUCED TO (number) METRES; 8) DRIFTING SNOW; 9) LOOSE SAND; 10) CHEMICALLY TREATED; 11) SNOWBANK (number) METRES [LEFT, or RIGHT or LEFT AND RIGHT] [OF or FROM] CENTRELINE; 12) TAXIWAY (identification of taxiway) SNOWBANK (number). METRES [LEFT, or RIGHT or LEFT AND RIGHT] [OF or FROM] CENTRELINE; 13) ADJACENT SNOWBANKS; 14) TAXIWAY (identification of taxiway) POOR; 15) APRON (identification of apron) POOR; 16) Plain language remarks b) [(location)] RUNWAY SURFACE CONDITION RUNWAY (number) NOT CURRENT; c) LANDING SURFACE (condition); d) CAUTION CONSTRUCTION WORK (location); e) CAUTION (specify reasons) RIGHT (or LEFT), (or BOTH SIDES) OF RUNWAY [number]; f) CAUTION WORK IN PROGRESS (or OBSTRUCTION) (position and any necessary advice); g) BRAKING ACTION REPORTED BY (aircraft type) AT (time) GOOD (or GOOD TO MEDIUM, or MEDIUM, or MEDIUM TO POOR, or POOR); h) (TAXIWAY) (identification of taxiway) WET [or STANDING

Circumstances	*Phraseologies*
	WATER, or SNOW REMOVED (length and width as applicable), or CHEMICALLY TREATED, or COVERED WITH PATCHES OF DRY SNOW (or WET SNOW, or COMPACTED SNOW, or SLUSH, or FROZEN SLUSH, or ICE, or WET ICE, or ICE UNDERNEATH, or ICE AND SNOW, or SNOWDRIFTS, or FROZEN RUTS AND RIDGES or LOOSE SAND)]; i) TOWER OBSERVES (weather information); j) PILOT REPORTS (weather information).
1-1-1-11 **OPERATIONAL STATUS OF VISUAL AND NON-VISUAL AIDS**	a) (specify visual or non-visual aid) RUNWAY (number) (description of deficiency); b) (type) LIGHTING (unserviceability); c) GBAS/SBAS/ILS CATEGORY (category) (serviceability state); d) TAXIWAY LIGHTING (description of deficiency); e) (type of visual approach slope indicator) RUNWAY (number) (description of deficiency).
1-1-1-12 **REDUCED VERTICAL SEPARATION MINIMUM (RVSM) OPERATIONS**	
... to ascertain RVSM approval status of an aircraft	a) CONFIRM RVSM APPROVED;
... to report RVSM approved status	*b) AFFIRM RVSM;
... to report RVSM non-approved status followed by supplementary information	*c) NEGATIVE RVSM [(supplementary information, e.g. State Aircraft)];
... to deny ATC clearance into RVSM airspace	d) UNABLE ISSUE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN [or DESCEND AND MAINTAIN, or CLIMB AND MAINTAIN] (level);
... to report when severe turbulence affects the capability of an aircraft to maintain height-keeping requirements for RVSM	*e) UNABLE RVSM DUE TURBULENCE;
... to report that the equipment of an aircraft has degraded below minimum aviation system performance standards	*f) UNABLE RVSM DUE EQUIPMENT;
...to request an aircraft to provide information as soon as RVSM-approved status has been regained or the pilot is ready to resume RVSM operations	g) REPORT WHEN ABLE TO RESUME RVSM;
... to request confirmation that an aircraft has regained RVSM-approved status or a pilot is ready to resume RVSM operations	h) CONFIRM ABLE TO RESUME RVSM;

Circumstances	*Phraseologies*
... to report ability to resume RVSM operations after an equipment or weather-related contingency	*i) READY TO RESUME RVSM. * Denotes pilot transmission
1-1-1-13 **GNSS SERVICE STATUS**	a) GNSS REPORTED UNRELIABLE (or GNSS MAY NOT BE AVAILABLE [DUE TO INTERFERENCE]); 1) IN THE VICINITY OF (location) (radius) [BETWEEN (levels)]; or 2) IN THE AREA OF (description) (or IN (name) FIR) [BETWEEN (levels)]; b) BASIC GNSS (or SBAS, or GBAS) UNAVAILABLE FOR (specify operation) [FROM (time) TO (time) (or UNTIL FURTHER NOTICE)]; *c) BASIC GNSS UNAVAILABLE [DUE TO (reason e.g. LOSS OF RAIM or RAIM ALERT)]; *d) GBAS (or SBAS) UNAVAILABLE. * Denotes pilot transmission.
1-1-1-14 **DEGRADATION OF AIRCRAFT NAVIGATION PERFORMANCE**	UNABLE RNP (specify type) (or RNAV) [DUE TO (reason e.g. LOSS OF RAIM or RAIM ALERT)].

1-1-2 AREA CONTROL SERVICES

Circumstances	*Phraseologies*
1-1-2-1 **ISSUANCE OF A CLEARANCE**	a) (name of unit) CLEARS (aircraft call sign); b) (aircraft call sign) CLEARED TO; c) RECLEARED (amended clearance details) [REST OF CLEARANCE UNCHANGED]; d) RECLEARED (amended route portion) TO (significant point of original route) [REST OF CLEARANCE UNCHANGED]; e) ENTER CONTROLLED AIRSPACE (or CONTROL ZONE) [VIA (significant point or route)] AT (level) [AT (time)]; f) LEAVE CONTROLLED AIRSPACE (or CONTROL ZONE) [VIA (significant point or route)] AT (level) (or CLIMBING, or DESCENDING); g) JOIN (specify) AT (significant point) AT (level) [AT (time)].
1-1-2-2	

Circumstances	*Phraseologies*
INDICATION OF ROUTE AND CLEARANCE LIMIT	a) FROM (location) TO (location); b) TO (location), *followed as necessary by:* 1) DIRECT; 2) VIA (route and/or significant points); 3) FLIGHT PLANNED ROUTE; 4) VIA (distance) DME ARC (direction) OF (name of DME station); c) (route) NOT AVAILABLE DUE (reason) ALTERNATIVE[S] IS/ARE (routes) ADVISE.
1-1-2-3 **MAINTENANCE OF SPECIFIED LEVELS**	a) MAINTAIN (level) [TO (significant point)]; b) MAINTAIN (level) UNTIL PASSING (significant point); c) MAINTAIN (level) UNTIL (minutes) AFTER PASSING (significant point); d) MAINTAIN (level) UNTIL (time); e) MAINTAIN (level) UNTIL ADVISED BY (name of unit); f) MAINTAIN (level) UNTIL FURTHER ADVISED; g) MAINTAIN (level) WHILE IN CONTROLLED AIRSPACE; h) MAINTAIN BLOCK (level) TO (level). ***Note.—*** *The term "MAINTAIN" is not to be used in lieu of "DESCEND" or "CLIMB" when instructing an aircraft to change level.*
1-1-2-4 **SPECIFICATION OF CRUISING LEVELS**	a) CROSS (significant point) AT (or ABOVE, or BELOW) (level); b) CROSS (significant point) AT (time) OR LATER (or BEFORE) AT (level); c) CRUISE CLIMB BETWEEN (levels) (or ABOVE (level)); d) CROSS (distance) DME [(direction)] OF (name of DME station) (or (distance) [(direction)] OF (significant point)) AT (or ABOVE or BELOW) (level).
1-1-2-5 **EMERGENCY DESCENT**	*a) EMERGENCY DESCENT (intentions); b) ATTENTION ALL AIRCRAFT IN THE VICINITY OF [or AT] (significant point or location) EMERGENCY DESCENT IN PROGRESS FROM (level) (followed as necessary by specific instructions, clearances, traffic information, etc.). * Denotes pilot transmission.
1-1-2-6	

Circumstances	*Phraseologies*
IF CLEARANCE CANNOT BE ISSUED IMMEDIATELY UPON REQUEST	EXPECT CLEARANCE (or type of clearance) AT (time).
1-1-2-7 **WHEN CLEARANCE FOR DEVIATION CANNOT BE ISSUED**	UNABLE, TRAFFIC (direction) BOUND (type of aircraft) (level) ESTIMATED (or OVER) (significant point) AT (time) CALL SIGN (call sign) ADVISE INTENTIONS.
1-1-2-8 **SEPARATION INSTRUCTIONS**	a) CROSS (significant point) AT (time) [OR LATER (or OR BEFORE)]; b) ADVISE IF ABLE TO CROSS (significant point) AT (time or level); c) MAINTAIN MACH (number) [OR GREATER (or OR LESS)] [UNTIL (significant point)]; d) DO NOT EXCEED MACH (number).
1-1-2-9 **INSTRUCTIONS ASSOCIATED WITH FLYING A TRACK (OFFSET), PARALLEL TO THE CLEARED ROUTE**	a) ADVISE IF ABLE TO PROCEED PARALLEL OFFSET; b) PROCEED OFFSET (distance) RIGHT/LEFT OF (route) (track) [CENTRE LINE] [AT (significant point or time)] [UNTIL (significant point or time)]; c) CANCEL OFFSET (instructions to rejoin cleared flight route or other information).

1-1-3 APPROACH CONTROL SERVICES

Circumstances	*Phraseologies*
1-1-3-1 **DEPARTURE INSTRUCTIONS**	a) [AFTER DEPARTURE] TURN RIGHT (or LEFT) HEADING (three digits) (or CONTINUE RUNWAY HEADING) (or TRACK EXTENDED CENTRE LINE) TO (level or significant point) [(other instructions as required)]; b) AFTER REACHING (or PASSING) (level or significant point) (instructions); c) TURN RIGHT (or LEFT) HEADING (three digits) TO (level) [TO INTERCEPT (track, route, airway, etc.)]; d) (standard departure name and number) DEPARTURE; e) TRACK (three digits) DEGREES [MAGNETIC (or TRUE)] TO (or FROM) (significant point) UNTIL (time, or REACHING (fix or significant point or level)) [BEFORE PROCEEDING ON COURSE]; f) CLEARED (designation) DEPARTURE.
1-1-3-2 **APPROACH INSTRUCTIONS**	a) CLEARED (designation) ARRIVAL; b) CLEARED TO (clearance limit) (designation);

Circumstances	*Phraseologies*
	c) CLEARED (or PROCEED) (details of route to be followed); d) CLEARED (type of approach) APPROACH [RUNWAY (number)]; e) CLEARED (type of approach) RUNWAY (number) FOLLOWED BY CIRCLING TO RUNWAY (number); f) CLEARED APPROACH [RUNWAY (number)]; g) COMMENCE APPROACH AT (time); *h) REQUEST STRAIGHT-IN [(type of approach)] APPROACH [RUNWAY (number)]; i) CLEARED STRAIGHT-IN [(type of approach)] APPROACH [RUNWAY (number)]; j) REPORT VISUAL; k) REPORT RUNWAY [LIGHTS] IN SIGHT; *l) REQUEST VISUAL APPROACH; m) CLEARED VISUAL APPROACH RUNWAY (number); n) REPORT (significant point); [OUTBOUND, or INBOUND]; o) REPORT COMMENCING PROCEDURE TURN; *p) REQUEST VMC DESCENT; q) MAINTAIN OWN SEPARATION; r) MAINTAIN VMC; s) ARE YOU FAMILIAR WITH (name) APPROACH PROCEDURE; *t) REQUEST (type of approach) APPROACH [RUNWAY (number)]; *u) REQUEST (RNAV plain language designator); v) CLEARED (RNAV plain language designator). * Denotes pilot transmission.
1-1-3-3 **HOLDING CLEARANCES** ... visual ... published holding procedure over a facility or fix	a) HOLD VISUAL [OVER] (position), (or BETWEEN (two prominent landmarks)); b) CLEARED (or PROCEED) TO (significant point, name of facility or fix) [MAINTAIN (or CLIMB AND MAINTAIN or DESCEND AND MAINTAIN) (level)] HOLD [(direction)] AS PUBLISHED EXPECT FURTHER CLEARANCE AT (time);

Circumstances	*Phraseologies*
... when a detailed holding clearance is required	*c) REQUEST HOLDING INSTRUCTIONS; d) CLEARED (or PROCEED) TO (significant point, name of facility or fix) [MAINTAIN (or CLIMB AND MAINTAIN or DESCEND AND MAINTAIN) (level)] HOLD [(direction)] [(specified) RADIAL, COURSE, INBOUND TRACK (three digits) DEGREES] [RIGHT (or LEFT) HAND PATTERN] [OUTBOUND TIME (number) MINUTES] EXPECT FURTHER CLEARANCE AT (time) (additional instructions, if necessary); e) CLEARED TO THE (three digits) RADIAL OF THE (name) VOR AT (distance) DME FIX [MAINTAIN (or CLIMB AND MAINTAIN or DESCEND AND MAINTAIN) (level)] HOLD [(direction)] [RIGHT (or LEFT) HAND PATTERN] [OUTBOUND TIME (number) MINUTES] EXPECT FURTHER CLEARANCE) AT (time) (additional instructions, if necessary); f) CLEARED TO THE (three digits) RADIAL OF THE (name) VOR AT (distance) DME FIX [MAINTAIN (or CLIMB AND MAINTAIN or DESCEND AND MAINTAIN) (level)] HOLD BETWEEN (distance) AND (distance) DME [RIGHT (or LEFT) HAND PATTERN] EXPECT FURTHER CLEARANCE AT (time) (additional instructions, if necessary). * Denotes pilot transmission.
1-1-3-4 **EXPECTED FURTHER CLEARANCE**	a) NO DELAY EXPECTED; b) EXPECTED APPROACH TIME (time); c) REVISED EXPECTED FURTHER CLEARANCE (time); d) DELAY NOT DETERMINED (reasons).

1-1-4 PHRASEOLOGIES FOR USE ON AND IN THE VICINITY OF THE AERODROME

Circumstances	*Phraseologies*
1-1-4-1 **IDENTIFICATION OF AIRCRAFT**	SHOW LANDING LIGHTS.
1-1-4-2 **ACKNOWLEDGEMENT BY VISUAL MEANS**	a) ACKNOWLEDGE BY MOVING AILERONS (or RUDDER); b) ACKNOWLEDGE BY ROCKING WINGS; c) ACKNOWLEDGE BY FLASHING LANDING LIGHTS.
1-1-4-3 **STARTING PROCEDURES** ... to request permission to start engines	*a) [aircraft location] REQUEST START UP; *b) [aircraft location] REQUEST START UP, INFORMATION (ATIS identification);

Circumstances	*Phraseologies*
... ATC replies	c) START UP APPROVED; d) START UP AT (time); e) EXPECT START UP AT (time); f) START UP AT OWN DISCRETION; g) EXPECT DEPARTURE (time) START UP AT OWN DISCRETION. * Denotes pilot transmission.
1-1-4-4 **PUSH-BACK PROCEDURES** ***Note.—*** *When local procedures so prescribe, authorization for pushback should be obtained from the control tower.* ... aircraft/ATC	*a) [aircraft location] REQUEST PUSHBACK; b) PUSHBACK APPROVED; c) STAND BY; d) PUSHBACK AT OWN DISCRETION; e) EXPECT (number) MINUTES DELAY DUE (reason). * Denotes pilot transmission.
1-1-4-5 **TOWING PROCEDURES** ... ATC response	†a) REQUEST TOW [company name] (aircraft type) FROM (location) TO (location); b) TOW APPROVED VIA (specific routing to be followed); c) HOLD POSITION; d) STAND BY. † Denotes transmission from aircraft/tow vehicle combination.
1-1-4-6 **TO REQUEST TIME CHECK AND/ORVAERODROME DATA FOR DEPARTURE** ... when no ATIS broadcast is available	*a) REQUEST TIME CHECK; b) TIME (time); *c) REQUEST DEPARTURE INFORMATION; d) RUNWAY (number), WIND (direction and speed) (units) QNH (or QFE) (number) [(units)] TEMPERATURE [MINUS] (number), [VISIBILITY (distance) (units) (or RUNWAY VISUAL RANGE (or RVR) (distance) (units))] [TIME (time)]. ***Note.—*** *If multiple visibility and RVR observations are available, those that represent the roll-out/stop end zone should be used for take-off.*

Circumstances	*Phraseologies*
	* Denotes pilot transmission.
1-1-4-7 **TAXI PROCEDURES**	
... for departure	*a) [aircraft type] [wake turbulence category if “super” or “heavy”] [aircraft location] REQUEST TAXI [intentions]; *b) [aircraft type] [wake turbulence category if “super” or “heavy”] [aircraft location] (flight rules) TO (aerodrome of destination) REQUEST TAXI [intentions]; c) TAXI TO HOLDING POINT [number] [RUNWAY (number)] [HOLD SHORT OF RUNWAY (number) (or CROSS RUNWAY (number))] [TIME (time)];
... where detailed taxi instructions are required	*d) [aircraft type] [wake turbulence category if “super” or “heavy”] REQUEST DETAILED TAXI INSTRUCTIONS; e) TAXI TO HOLDING POINT [number] [RUNWAY (number)] VIA (specific route to be followed) [TIME (time)] [HOLD SHORT OF RUNWAY (number) (or CROSS RUNWAY (number))];
... where aerodrome information is not available from an alternative source such as ATIS	f) TAXI TO HOLDING POINT [number] (followed by aerodrome information as applicable) [TIME (time)]; g) TAKE (or TURN) FIRST (or SECOND) LEFT (or RIGHT); h) TAXI VIA (identification of taxiway); i) TAXI VIA RUNWAY (number); j) TAXI TO TERMINAL (or other location, e.g. GENERAL AVIATION AREA) [STAND (number)];
...for helicopter operations	*k) REQUEST AIR-TAXIING FROM (or VIA) TO (location or routing as appropriate); l) AIR-TAXI TO (or VIA) (location or routing as appropriate) [CAUTION (dust, blowing snow, loose debris, taxiing light aircraft, personnel, etc.)]; m) AIR TAXI VIA (direct, as requested, or specified route) TO (location, heliport, operating or movement area, active or inactive runway). AVOID (aircraft or vehicles or personnel);
... after landing	*n) REQUEST BACKTRACK; o) BACKTRACK APPROVED; p) BACKTRACK RUNWAY (number);
... general	*q) [(aircraft location)] REQUEST TAXI TO (destination on aerodrome); r) TAXI STRAIGHT AHEAD;

Circumstances	*Phraseologies*
	s) TAXI WITH CAUTION; t) GIVE WAY TO (description and position of other aircraft); *u) GIVING WAY TO (traffic); *v) TRAFFIC (or type of aircraft) IN SIGHT; w) TAXI INTO HOLDING BAY; x) FOLLOW (description of other aircraft or vehicle); y) VACATE RUNWAY; *z) RUNWAY VACATED; aa) EXPEDITE TAXI [(reason)]; *bb) EXPEDITING; cc) [CAUTION] TAXI SLOWER [reason]; *dd) SLOWING DOWN. * Denotes pilot transmission.
1-1-4-8 **HOLDING** ... to hold not closer to a runway than specified in ATMP 3-7-4.	‡a) HOLD (direction) OF (position, runway number, etc.); ‡b) HOLD POSITION; ‡c) HOLD (distance) FROM (position); ‡d) HOLD SHORT OF (position); *e) HOLDING; *f) HOLDING SHORT. ‡Requires specific acknowledgement from the pilot. *Denotes pilot transmission. The procedure words ROGER and WILCO are insufficient acknowledgement of the instructions HOLD, HOLD POSITION and HOLD SHORT OF (position). In each case the acknowledgement shall be by the phraseology HOLDING or HOLDING SHORT, as appropriate.
1-1-4-9 **TO CROSS A RUNWAY**	*a) REQUEST CROSS RUNWAY (number); ***Note.—*** *If the control tower is unable to see the crossing aircraft (e.g. night, low visibility, etc.), the instruction should always be accompanied by a request to report when the aircraft has vacated the runway.* b) CROSS RUNWAY (number) [REPORT VACATED]; c) EXPEDITE CROSSING RUNWAY (number) TRAFFIC (aircraft type) (distance) KILOMETERS (or MILES) FINAL;

Circumstances	*Phraseologies*
	d) TAXI TO HOLDING POINT [number] [RUNWAY (number)] VIA (specific route to be followed), [HOLD SHORT OF RUNWAY (number)] or [CROSS RUNWAY (number)];
Note. — *The pilot will, when requested, report "RUNWAY VACATED" when the entire aircraft is beyond the relevant runway-holding position.*	*e) RUNWAY VACATED. * Denotes pilot transmission.
1-1-4-10 **PREPARATION FOR TAKE-OFF**	a) UNABLE TO ISSUE (designator) DEPARTURE (reasons);
	b) REPORT WHEN READY [FOR DEPARTURE];
	c) ARE YOU READY [FOR DEPARTURE]?
	d) ARE YOU READY FOR IMMEDIATE DEPARTURE?;
	*e) READY;
... clearance to enter runway and await take-off clearance	f) LINE UP [AND WAIT];
	†g) LINE UP RUNWAY *(number)*;
	h) LINE UP BE READY FOR IMMEDIATE DEPARTURE;
..	k) [THAT IS] CORRECT (*or* NEGATIVE) [I SAY AGAIN] ...*(as appropriate)*.
	* Denotes pilot transmission. † When there is the possibility of confusion during multiple runway operations.
1-1-4-11 **TAKE-OFF CLEARANCE**	a) RUNWAY (number) CLEARED FOR TAKE-OFF [REPORT AIRBORNE];
... when reduced runway separation is used	b) (traffic information) RUNWAY (number) CLEARED FOR TAKE-OFF;
... when take-off clearance has not been complied with	c) TAKE OFF IMMEDIATELY OR VACATE RUNWAY [(instructions)];
	d) TAKE OFF IMMEDIATELY OR HOLD SHORT OF RUNWAY;
... to cancel a take-off clearance	e) HOLD POSITION, CANCEL TAKE-OFF I SAY AGAIN CANCEL TAKE-OFF (reasons);
	*f) HOLDING;
... to stop a take-off after an	g) STOP IMMEDIATELY [(repeat aircraft call sign) STOP

Circumstances	*Phraseologies*
aircraft has commenced take-off roll	IMMEDIATELY]; *h) STOPPING;
... for helicopter operations	i) CLEARED FOR TAKE-OFF [FROM (location)] (present position, taxiway, final approach and take-off area, runway and number); *j) REQUEST DEPARTURE INSTRUCTIONS; k) AFTER DEPARTURE TURN RIGHT (or LEFT, or CLIMB) (instructions as appropriate). * Denotes pilot transmission. HOLDING and STOPPING are the procedural responses to e) and g) respectively.
1-1-4-12 **TURN OR CLIMB INSTRUCTIONS AFTER TAKE-OFF**	*a) REQUEST RIGHT (or LEFT) TURN; b) RIGHT (or LEFT) TURN APPROVED; c) WILL ADVISE LATER FOR RIGHT (or LEFT) TURN;
... to request airborne time	d) REPORT AIRBORNE; e) AIRBORNE (time); f) AFTER PASSING (level) (instructions);
... heading to be followed	g) CONTINUE RUNWAY HEADING (instructions);
... when a specific track is to be followed	h) TRACK EXTENDED CENTRE LINE (instructions); i) CLIMB STRAIGHT AHEAD (instructions). * Denotes pilot transmission.
1-1-4-13 **ENTERING AN AERODROME TRAFFIC CIRCUIT**	*a) [aircraft type] (position) (level) FOR LANDING; b) JOIN [(direction of circuit)] (position in circuit) (runway number) [SURFACE] WIND (direction and speed) (units) [TEMPERATURE [MINUS] (number)] QNH (or QFE) (number) [(units)] [TRAFFIC (detail)]; c) MAKE STRAIGHT-IN APPROACH, RUNWAY (number) [SURFACE] WIND (direction and speed) (units) [TEMPERATURE [MINUS] (number)] QNH (or QFE) (number) [(units)] [TRAFFIC (detail)];
... when ATIS information is available	*d) (aircraft type) (position) (level) INFORMATION (ATIS identification) FOR LANDING; e) JOIN (position in circuit) [RUNWAY (number)] QNH (or QFE) (number) [(units)] [TRAFFIC (detail)]. * Denotes pilot transmission.
1-1-4-14 **IN THE CIRCUIT**	*a) (position in circuit, e.g. DOWNWIND/FINAL);

Circumstances	*Phraseologies*
	b) NUMBER ... FOLLOW (aircraft type and position) [additional instructions if required]. * Denotes pilot transmission.
1-1-4-15 **APPROACH INSTRUCTIONS** ***Note.—*** *The report "LONG FINAL" is made when aircraft turn on to final approach at a distance greater than 7 km (4 NM) from touchdown or when an aircraft on a straight-in approach is 15 km (8 NM) from touchdown. In both cases a report "FINAL" is required at 7 km (4 NM) from touchdown.*	a) MAKE SHORT APPROACH; b) MAKE LONG APPROACH (or EXTEND DOWNWIND); c) REPORT BASE (or FINAL, or LONG FINAL); d) CONTINUE APPROACH [PREPARE FOR POSSIBLE GO AROUND].
1-1-4-16 **LANDING CLEARANCE** ... when reduced runway separation is used ... special operations ... to make an approach along, or parallel to a runway, descending to an agreed minimum level ... to fly past the control tower or other observation point for the purpose of visual inspection by persons on the ground ... for helicopter operations	a) RUNWAY (number) CLEARED TO LAND; b) (traffic information) RUNWAY (number) CLEARED TO LAND; c) CLEARED TOUCH AND GO; d) MAKE FULL STOP; *e) REQUEST LOW APPROACH (reasons); f) CLEARED LOW APPROACH [RUNWAY (number)] [(altitude restriction if required) (go around instructions)]; *g) REQUEST LOW PASS (reasons); h) CLEARED LOW PASS [as in f)]; *i) REQUEST STRAIGHT-IN (or CIRCLING APPROACH, LEFT (or RIGHT) TURN TO (location)); j) MAKE STRAIGHT-IN (or CIRCLING APPROACH, LEFT (or RIGHT) TURN TO (location, runway, taxiway, final approach and take-off area)) [ARRIVAL (or ARRIVAL ROUTE) (number, name, or code)]. [HOLD SHORT OF (active runway, extended runway centre line, other)]. [REMAIN (direction or distance) FROM (runway, runway centre line, other helicopter or aircraft)]. [CAUTION (power lines, unlighted obstructions, wake turbulence, etc.)]. CLEARED TO LAND. * Denotes pilot transmission.
1-1-4-17 **DELAYING AIRCRAFT**	a) CIRCLE THE AERODROME; b) ORBIT (RIGHT, or LEFT) [FROM PRESENT POSITION];

Circumstances	*Phraseologies*
	c) MAKE ANOTHER CIRCUIT.
1-1-4-18 **MISSED APPROACH**	a) GO AROUND; *b) GOING AROUND. * Denotes pilot transmission.
1-1-4-19 **INFORMATION TO AIRCRAFT** ... when pilot requested visual inspection of landing gear	a) LANDING GEAR APPEARS DOWN; b) RIGHT (or LEFT, or NOSE) WHEEL APPEARS UP (or DOWN); c) WHEELS APPEAR UP; d) RIGHT (or LEFT, or NOSE) WHEEL DOES NOT APPEAR UP (or DOWN);
... wake turbulence	e) CAUTION WAKE TURBULENCE [FROM ARRIVING (or DEPARTING) (type of aircraft)] [additional information as required];
... jet blast on apron or taxiway	f) CAUTION JET BLAST;
... propeller-driven aircraft slipstream	g) CAUTION SLIPSTREAM.
1-1-4-20 **RUNWAY VACATING AND COMMUNICATIONS AFTER LANDING**	a) CONTACT GROUND (frequency); b) WHEN VACATED CONTACT GROUND (frequency); c) EXPEDITE VACATING; d) YOUR STAND (or GATE) (designation); e) TAKE (or TURN) FIRST (or SECOND, or CONVENIENT) LEFT (or RIGHT) AND CONTACT GROUND (frequency);
... for helicopter operations	f) AIR-TAXI TO HELICOPTER STAND (or) HELICOPTER PARKING POSITION (area); g) AIR-TAXI TO (or VIA) (location or routing as appropriate) [CAUTION (dust, blowing snow, loose debris, taxiing light aircraft, personnel, etc.)]; h) AIR TAXI VIA (direct, as requested, or specified route) TO (location, heliport, operating or movement area, active or inactive runway). AVOID (aircraft or vehicles or personnel)

1-1-5 COORDINATION BETWEEN ATS UNITS

Circumstances	*Phraseologies*
1-1-5-1 **ESTIMATES AND REVISIONS**	a) ESTIMATE [direction of flight] (aircraft call sign)

Circumstances	*Phraseologies*
	[SQUAWKING (SSR Code)] (type) ESTIMATED (significant point) (time) (level) (or DESCENDING FROM (level) TO (level)) [SPEED (filed TAS)] (route) [REMARKS];
... sending unit	b) ESTIMATE (significant point) ON (aircraft call sign);
... receiving unit reply (if flight plan details are not available)	c) NO DETAILS;
... receiving unit reply (if flight plan details are available)	(aircraft type) (destination);
... sending unit reply	[SQUAWKING (SSR Code)] [ESTIMATED] (significant point) (time) AT (level); ***Note.—*** *In the event that flight plan details are not available the receiving station shall reply to b) NO DETAILS and transmitting station shall pass full estimate as in a).* d) ESTIMATE UNMANNED FREE BALLOON(S) (identification and classification) ESTIMATED OVER (place) AT (time) REPORTED FLIGHT LEVEL(S) (figure or figures) [or FLIGHT LEVEL UNKNOWN] MOVING (direction) ESTIMATED GROUND SPEED (figure) (other pertinent information, if any); e) REVISION (aircraft call sign) (details as necessary).
1-1-5-2 **TRANSFER OF CONTROL**	a) REQUEST RELEASE OF (aircraft call sign); b) (aircraft call sign) RELEASED [AT (time)] [conditions/restrictions]; c) IS (aircraft call sign) RELEASED [FOR CLIMB (or DESCENT)]; d) (aircraft call sign) NOT RELEASED [UNTIL (time or significant point)]; e) UNABLE (aircraft call sign) [TRAFFIC IS (details)].
1-1-5-3 **CHANGE OF CLEARANCE**	a) MAY WE CHANGE CLEARANCE OF (aircraft call sign) TO (details of alteration proposed); b) AGREED TO (alteration of clearance) OF (aircraft call sign); c) UNABLE (aircraft call sign); d) UNABLE (desired route, level, etc.) [FOR (aircraft call sign)] [DUE (reason)] (alternative clearance proposed).
1-1-5-4 **APPROVAL REQUEST**	a) APPROVAL REQUEST (aircraft call sign) ESTIMATED DEPARTURE FROM (significant point) AT (time); b) (aircraft call sign) REQUEST APPROVED [(restriction if any)];

Circumstances	*Phraseologies*
	c) (aircraft call sign) UNABLE (alternative instructions).
1-1-5-5 **INBOUND RELEASE**	[INBOUND RELEASE] (aircraft call sign) [SQUAWKING (SSR Code)] (type) FROM (departure point) RELEASED AT (significant point, or time, or level) CLEARED TO AND ESTIMATING (clearance limit) (time) AT (level) [EXPECTED APPROACH TIME or NO DELAY EXPECTED] CONTACT AT (time).
1-1-5-6 **RADAR HANDOVER**	RADAR HANDOVER (aircraft call sign) [SQUAWKING (SSR Code)] POSITION (aircraft position) (level).
1-1-5-7 **EXPEDITION OF CLEARANCE**	a) EXPEDITE CLEARANCE (aircraft call sign) EXPECTED DEPARTURE FROM (place) AT (time); b) EXPEDITE CLEARANCE (aircraft call sign) [ESTIMATED] OVER (place) AT (time) REQUESTS (level or route, etc.).
1-1-5-8 **REDUCED VERTICAL SEPARATION MINIMUM (RVSM) OPERATIONS** ... to verbally supplement estimate messages of aircraft non-approved for RVSM or to verbally supplement an automated estimate message exchange that does not automatically transfer information from Item 18 of the flight plan followed by supplementary information, as appropriate ... to communicate the cause of a contingency relating to an aircraft that is unable to conduct RVSM operations due to severe turbulence or other severe meteorological phenomena or equipment failure, as applicable	a) NEGATIVE RVSM [(supplementary information, e.g. State Aircraft)]; b) UNABLE RVSM DUE TURBULENCE (or EQUIPMENT, as applicable).

1-1-6 PHRASEOLOGIES TO BE USED RELATED TO CPDLC

Circumstances	*Phraseologies*
1-1-6-1 **FAILURE OF CPDLC**	[ALL STATIONS] CPDLC FAILURE (instructions).

1-2 RADAR PHRASEOLOGIES

1-2-1 GENERAL RADAR PHRASEOLOGIES

Circumstances	*Phraseologies*
1-2-1-1 **IDENTIFICATION OF AIRCRAFT**	a) REPORT HEADING [AND FLIGHT LEVEL (or ALTITUDE)]; b) FOR IDENTIFICATION TURN LEFT (or RIGHT) HEADING (three digits); c) TRANSMIT FOR IDENTIFICATION AND REPORT HEADING; d) RADAR CONTACT [position]; e) IDENTIFIED [position]; f) NOT IDENTIFIED [reason], [RESUME (or CONTINUE) OWN NAVIGATION].
1-2-1-2 **POSITION INFORMATION**	POSITION (distance) (direction) OF (significant point) (or OVER or ABEAM (significant point)).
1-2-1-3 **VECTORING INSTRUCTIONS**	a) LEAVE (significant point) HEADING (three digits); b) CONTINUE HEADING (three digits); c) CONTINUE PRESENT HEADING; d) FLY HEADING (three digits); e) TURN LEFT (or RIGHT) HEADING (three digits) [reason]; f) TURN LEFT (or RIGHT) (number of degrees) DEGREES [reason]; g) STOP TURN HEADING (three digits); h) FLY HEADING (three digits), WHEN ABLE PROCEED DIRECT (name) (significant point); i) HEADING IS GOOD.
1-2-1-4 **TERMINATION OF RADAR VECTORING**	a) RESUME OWN NAVIGATION (position of aircraft) (specific instructions); b) RESUME OWN NAVIGATION [DIRECT] (significant point) [MAGNETIC TRACK (three digits) DISTANCE (number) KILOMETERS (or MILES)].
1-2-1-5 **MANOEUVRES** ... (in case of unreliable directional	a) MAKE A THREE SIXTY TURN LEFT (or RIGHT) [reason]; b) ORBIT LEFT (or RIGHT) [reason]; c) MAKE ALL TURNS RATE ONE (or RATE HALF, or (number)

Circumstances	*Phraseologies*
instruments on board aircraft) ***Note.—*** *When it is necessary to specify a reason for radar vectoring or for the above manoeuvres, the following phraseologies should be used:* *a) DUE TRAFFIC;* *b) FOR SPACING;* *c) FOR DELAY;* *d) FOR DOWNWIND (or BASE, or FINAL).*	DEGREES PER SECOND) START AND STOP ALL TURNS ON THE COMMAND "NOW"; d) TURN LEFT (or RIGHT) NOW; e) STOP TURN NOW.
1-2-1-6 **SPEED CONTROL**	a) REPORT SPEED; *b) SPEED (number) KILOMETERS PER HOUR (or KNOTS); c) MAINTAIN (number) KILOMETERS PER HOUR (or KNOTS) [OR GREATER (or OR LESS)] [UNTIL (significant point)]; d) DO NOT EXCEED (number) KILOMETERS PER HOUR (or KNOTS); e) MAINTAIN PRESENT SPEED; f) INCREASE (or REDUCE) SPEED TO (number) KILOMETERS PER HOUR (or KNOTS) [OR GREATER (or OR LESS)]; g) INCREASE (or REDUCE) SPEED BY (number) KILOMETERS PER HOUR (or KNOTS); h) RESUME NORMAL SPEED; i) REDUCE TO MINIMUM APPROACH SPEED; j) REDUCE TO MINIMUM CLEAN SPEED; k) NO [ATC] SPEED RESTRICTIONS. * Denotes pilot transmission.
1-2-1-7 **POSITION REPORTING** ... to omit position reports when under radar control	a) OMIT POSITION REPORTS [UNTIL (specify)]; b) NEXT REPORT AT (significant point); c) REPORTS REQUIRED ONLY AT (significant point(s)); d) RESUME POSITION REPORTING.
1-2-1-8 **TRAFFIC INFORMATION AND AVOIDING ACTION**	a) TRAFFIC (number) O'CLOCK (distance) (direction of flight) [any other pertinent information]:

Circumstances	*Phraseologies*
	1) UNKNOWN; 2) SLOW MOVING; 3) FAST MOVING; 4) CLOSING; 5) OPPOSITE (or SAME) DIRECTION; 6) OVERTAKING; 7) CROSSING LEFT TO RIGHT (or RIGHT TO LEFT);
... (if known)	8) (aircraft type); 9) (level); 10) CLIMBING (or DESCENDING);
... to request avoiding action	*b) REQUEST VECTORS; c) DO YOU WANT VECTORS?
... when passing unknown traffic	d) CLEAR OF TRAFFIC [appropriate instructions];
... for avoiding action	e) TURN LEFT (or RIGHT) IMMEDIATELY HEADING (three digits) TO AVOID [UNIDENTIFIED] TRAFFIC (bearing by clock-reference and distance); f) TURN LEFT (or RIGHT) (number of degrees) DEGREES IMMEDIATELY TO AVOID [UNIDENTIFIED] TRAFFIC AT (bearing by clock-reference and distance). * Denotes pilot transmission.
1-2-1-9 **COMMUNICATIONS AND LOSS OF COMMUNICATIONS**	a) [IF] RADIO CONTACT LOST (instructions); b) IF NO TRANSMISSIONS RECEIVED FOR (number) MINUTES (or SECONDS) (instructions); c) REPLY NOT RECEIVED (instructions);
... if loss of communications suspected	d) IF YOU READ [maneuver instructions or SQUAWK (code or IDENT)]; e) (maneuver or SQUAWK) OBSERVED. POSITION (position of aircraft). WILL CONTINUE RADAR CONTROL.
1-2-1-10 **TERMINATION OF RADAR SERVICE**	a) RADAR CONTROL TERMINATED [DUE (reason)]; b) RADAR SERVICE TERMINATED (instructions); c) WILL SHORTLY LOSE IDENTIFICATION (appropriate instructions or information);

Circumstances	*Phraseologies*
	d) IDENTIFICATION LOST [reasons] (instructions).
1-2-1-11 **RADAR EQUIPMENT DEGRADATION**	a) SECONDARY RADAR OUT OF SERVICE (appropriate information as necessary); b) PRIMARY RADAR OUT OF SERVICE (appropriate information as necessary).

1-2-2 RADAR IN APPROACH CONTROL SERVICES

Circumstances	*Phraseologies*
1-2-2-1 **VECTORING FOR APPROACH**	a) VECTORING FOR (type of pilot-interpreted aid) APPROACH RUNWAY (number); b) VECTORING FOR VISUAL APPROACH RUNWAY (number) REPORT FIELD (or RUNWAY) IN SIGHT; c) VECTORING FOR (positioning in the circuit); d) VECTORING FOR SURVEILLANCE RADAR APPROACH RUNWAY (number); e) VECTORING FOR PRECISION APPROACH RUNWAY (number); f) (type) APPROACH NOT AVAILABLE DUE (reason) (alternative instructions).
1-2-2-2 **VECTORING FOR ILS AND OTHER PILOT-INTERPRETED AIDS** ... when a pilot wishes to be positioned a specific distance from touchdown ... instructions and information	a) POSITION (number) KILOMETERS (or MILES) from (fix). TURN LEFT (or RIGHT) HEADING (three digits); b) YOU WILL INTERCEPT (FINAL APPROACH COURSE or radio aid) (distance) FROM (significant point or TOUCHDOWN); *c) REQUEST (distance) FINAL; d) CLEARED FOR (type of approach) APPROACH RUNWAY (number); e) REPORT ESTABLISHED ON LOCALIZER (or ON [RNP] [FINAL] APPROACH [COURSE]); f) CLOSING FROM LEFT (or RIGHT) [REPORT ESTABLISHED]; g) TURN LEFT (or RIGHT) HEADING (three digits) [TO INTERCEPT] or [REPORT ESTABLISHED]; h) EXPECT VECTOR ACROSS THE (LOCALIZER or [RNP] FINAL APPROACH COURSE or radio aid) (reason); i) THIS TURN WILL TAKE YOU THROUGH THE (LOCALIZER or [RNP] FINAL APPROACH COURSE or radio aid) [(reason)];

Circumstances	*Phraseologies*
	j) TAKING YOU THROUGH THE (LOCALIZER or [RNP] FINAL APPROACH COURSE or radio aid) [(reason)]; k) MAINTAIN (altitude) UNTIL GLIDE PATH INTERCEPTION; l) REPORT ESTABLISHED ON GLIDE PATH; m) INTERCEPT (LOCALIZER or [RNP] [FINAL] APPROACH [COURSE] or radio aid) [RUNWAY (number)] [REPORT ESTABLISHED]. * Denotes pilot transmission.
1-2-2-3 **RESERVED**	
1-2-2-4 **SURVEILLANCE RADAR APPROACH** **1-2-2-4-1** **PROVISION OF SERVICE**	a) THIS WILL BE A SURVEILLANCE RADAR APPROACH RUNWAY (number) TERMINATING AT (distance) FROM TOUCHDOWN, OBSTACLE CLEARANCE ALTITUDE (or HEIGHT) (number) METERS (or FEET) CHECK YOUR MINIMA [IN CASE OF GO AROUND (instructions)]; b) APPROACH INSTRUCTIONS WILL BE TERMINATED AT (distance) FROM TOUCHDOWN.
1-2-2-4-2 **ELEVATION**	a) COMMENCE DESCENT NOW [TO MAINTAIN A (number) DEGREE GLIDE PATH]; b) (distance) FROM TOUCHDOWN ALTITUDE (or HEIGHT) SHOULD BE (numbers and units).
1-2-2-4-3 **POSITION**	(distance) FROM TOUCHDOWN.
1-2-2-4-4 **CHECKS**	a) CHECK GEAR DOWN [AND LOCKED]; b) OVER THRESHOLD.
1-2-2-4-5 **COMPLETION OF APPROACH**	a) REPORT VISUAL; b) REPORT RUNWAY [LIGHTS] IN SIGHT; c) APPROACH COMPLETED [CONTACT (unit)].
1-2-2-5 **PAR APPROACH** **1-2-2-5-1** **PROVISION OF SERVICE**	a) THIS WILL BE A PRECISION RADAR APPROACH RUNWAY (number); b) PRECISION APPROACH NOT AVAILABLE DUE (reason) (alternative instructions); c) IN CASE OF GO AROUND (instructions).
1-2-2-5-2	

Circumstances	*Phraseologies*
COMMUNICATIONS	a) DO NOT ACKNOWLEDGE FURTHER TRANSMISSIONS; b) REPLY NOT RECEIVED. WILL CONTINUE INSTRUCTIONS.
1-2-2-5-3 **AZIMUTH**	a) CLOSING [SLOWLY (or QUICKLY)] [FROM THE LEFT (or FROM THE RIGHT)]; b) HEADING IS GOOD; c) ON TRACK; d) SLIGHTLY (or WELL, or GOING) LEFT (or RIGHT) OF TRACK; e) (number) METERS LEFT (or RIGHT) OF TRACK.
1-2-2-5-4 **ELEVATION**	a) APPROACHING GLIDE PATH; b) COMMENCE DESCENT NOW [AT (number) METERS PER SECOND OR (number) FEET PER MINUTE (or ESTABLISH A (number) DEGREE GLIDE PATH)]; c) RATE OF DESCENT IS GOOD; d) ON GLIDE PATH; e) SLIGHTLY (or WELL, or GOING) ABOVE (or BELOW) GLIDE PATH; f) [STILL] (number) METERS (or FEET) TOO HIGH (or TOO LOW); g) ADJUST RATE OF DESCENT; h) COMING BACK [SLOWLY (or QUICKLY)] TO THE GLIDE PATH; i) RESUME NORMAL RATE OF DESCENT; j) ELEVATION ELEMENT UNSERVICEABLE (to be followed by appropriate instructions); k) (distance) FROM TOUCHDOWN. ALTITUDE (or HEIGHT) SHOULD BE (numbers and units).
1-2-2-5-5 **POSITION**	a) (distance) FROM TOUCHDOWN; b) OVER APPROACH LIGHTS; c) OVER THRESHOLD.
1-2-2-5-6 **CHECKS**	a) CHECK GEAR DOWN AND LOCKED; b) CHECK DECISION ALTITUDE (or HEIGHT).
1-2-2-5-7 **COMPLETION OF APPROACH**	a) REPORT VISUAL;

Circumstances	*Phraseologies*
	b) REPORT RUNWAY [LIGHTS] IN SIGHT; c) APPROACH COMPLETED [CONTACT (unit)].
1-2-2-5-8 **MISSED APPROACH**	a) CONTINUE VISUALLY OR GO AROUND [missed approach instructions]; b) GO AROUND IMMEDIATELY [missed approach instructions] (reason); c) ARE YOU GOING AROUND? d) IF GOING AROUND (appropriate instructions); *e) GOING AROUND. * Denotes pilot transmission.

1-2-3 SECONDARY SURVEILLANCE RADAR (SSR) PHRASEOLOGIES

Circumstances	*Phraseologies*
1-2-3-1 **TO REQUEST THE CAPABILITY OF THE SSR EQUIPMENT**	a) ADVISE TRANSPONDER CAPABILITY; *b) TRANSPONDER (as shown in the flight plan); *c) NEGATIVE TRANSPONDER. * Denotes pilot transmission.
1-2-3-2 **TO INSTRUCT SETTING OF TRANSPONDER**	a) FOR DEPARTURE SQUAWK (code); b) SQUAWK (code).
1-2-3-3 **TO REQUEST THE PILOT TO RESELECT THE ASSIGNED MODE AND CODE**	a) RESET SQUAWK [(mode)] (code); *b) RESETTING (mode) (code). * Denotes pilot transmission.
1-2-3-4 **TO REQUEST RESELECTION OF AIRCRAFT IDENTIFICATION**	RESET MODE S IDENTIFICATION.
1-2-3-5 **TO REQUEST THE PILOT TO CONFIRM THE CODE SELECTED ON THE AIRCRAFT'S TRANSPONDER**	a) CONFIRM SQUAWK (code); *b) SQUAWKING (code). * Denotes pilot transmission.
1-2-3-6 **TO REQUEST THE OPERATION OF THE IDENT FEATURE**	a) SQUAWK [(code)] [AND] IDENT; b) SQUAWK LOW; c) SQUAWK NORMAL.
1-2-3-7	

Circumstances	*Phraseologies*
TO REQUEST TEMPORARY SUSPENSION OF TRANSPONDER OPERATION	SQUAWK STANDBY.
1-2-3-8 **TO REQUEST EMERGENCY CODE**	SQUAWK MAYDAY [CODE SEVEN-SEVEN-ZERO-ZERO]. 12.4.3.9 . 12.4.3.10 12.4.3.11 12.4.3.12 12.4.3.13
1-2-3-9 **TO REQUEST TERMINATION OF TRANSPONDER OPERATION**	STOP SQUAWK
1-2-3-10 **TO REQUEST TRANSMISSION OF PRESSURE ALTITUDE**	SQUAWK CHARLIE.
1-2-3-11 **TO REQUEST PRESSURE SETTING CHECK AND CONFIRMATION OF LEVEL**	CHECK ALTIMETER SETTING AND CONFIRM (level).
1-2-3-12 **TO REQUEST TERMINATION OF PRESSURE ALTITUDE TRANSMISSION BECAUSE OF FAULTY OPERATION**	STOP SQUAWK CHARLIE WRONG INDICATION.
1-2-3-13 **TO REQUEST LEVEL CHECK** ***Note.—*** *Other phraseologies for use in the area control radar service are given in the section containing approach control radar service phraseologies.*	CONFIRM (level).

1-3 RESERVED

1-4 ALERTING PHRASEOLOGIES

1-4-1 ALERTING PHRASEOLOGIES

Circumstances	*Phraseologies*
1-4-1-1 **LOW ALTITUDE WARNING**	(aircraft call sign) LOW ALTITUDE WARNING, CHECK YOUR ALTITUDE IMMEDIATELY, QNH IS (number) [(units)]. [THE MINIMUM FLIGHT ALTITUDE IS (altitude)].
1-4-1-2 **TERRAIN ALERT**	(aircraft call sign) TERRAIN ALERT, (suggested pilot action, if possible).

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Attachment. Pilot/Controller Glossary

A

ABBREVIATED IFR FLIGHT PLANS - An authorization by ATC requiring pilots to submit only that information needed for the purpose of ATC. It includes only a small portion of the usual IFR flight plan information. In certain instances, this may be only aircraft identification, location, and pilot request. Other information may be requested if needed by ATC for separation/control purposes. It is frequently used by
aircraft which are airborne and desire an instrument approach.

ABEAM -An aircraft is “abeam” a fix, point, or object when that fix, point, or object is approximately 90 degrees to the right or left of the aircraft track. Abeam indicates a general position rather than a precise point.

ABORT -Normally used by pilots to indicate that an aircraft manoeuvre has been terminated; e.g. an aborted takeoff.

ACCELERATE-STOP DISTANCE AVAILABLE - The length of the take-off run available plus the length of the stop way if provided.

ACCEPTING UNIT/CONTROLLER - Air traffic control unit/air traffic controller next to take control of an aircraft.

ACKNOWLEDGE Let me know that you have received and understood this message.

ACROBATIC FLIGHT Maneuvers intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed.

ADDITIONAL SERVICES – Advisory information provided by ATC which includes but is not limited to the following:

a. Traffic advisory.
b. Vectors, when requested by the pilot, to assist aircraft receiving traffic advisories to avoid observed traffic.
c. Level deviation information of 300 feet or more from an assigned level as observed on a verified (reading correctly) automatic readout (Mode C).
d. Advisories that traffic is no longer a factor.
e. Weather and chaff information.
f. Weather assistance.
g. Bird activity information.
h. Holding pattern surveillance.

Additional services are provided to the extent possible contingent only upon the controller's capability to fit them into the performance of higher priority duties and on the basis of limitations of the radar, volume of traffic, frequency congestion, and controller workload. The controller has complete discretion for determining if he is able to provide or continue to provide a service in a particular case. The controller's reason not to provide or continue to provide a service in a particular case is not subject to question by the pilot and need not to be made know to him.

ADS-C AGREEMENT -A reporting plan which establishes the conditions of ADS data reporting (i.e. data required by the air traffic services unit and frequency of ADS reports which have to be agreed to prior to using ADS-C in the provision of the air traffic services).

ADVISE INTENTIONS – ‘Tell me what you plan to do.’

AERIAL WORK - An aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial

advertisement, etc.

AERODROME ― A defined area on land or water (including any building, installation and equipment) intended to be used either wholly or in part for the arrival, departure, and movement of aircraft.

AERODROME BEACON ― Aeronautical beacon used to indicate the location of an aerodrome from the air. Usually alternating green and white flashes.

AERODROME CONTROL SERVICE ― Air traffic control service for aerodrome traffic.

AERODROME CONTROL TOWER ― A unit established to provide air traffic control service to aerodrome traffic.

AERODROME ELEVATION ― The elevation of the highest point of the landing area.

AERODROME MARKING ― A symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information.

AERODROME OPERATING MINIMA ― The limits of usability of an aerodrome for:

a. take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
b. landing in precision approach and landing operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the category of the operation;
c. landing in approach and landing operations with vertical guidance, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H); and
d. landing in non-precision approach and landing operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions.

AERODROME REFERENCE POINT ― The designated geographical location of an aerodrome.

AERODROME TRAFFIC ― All traffic on the maneuvering area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.
Note ― An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.

AERODROME TRAFFIC CIRCUIT ― The specified path to be flown in proper sequence or take-off and landing by aircraft operating in the vicinity of an aerodrome. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

a. Upwind Leg- A flight path parallel to the landing runway in the direction of landing.
b. Crosswind Leg- A flight path at right angles to the landing runway off its upwind end.
c. Downwind Leg- A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.
d. Base Leg- A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.
e. Final Approach. A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. An aircraft making a straight-in approach VFR is also considered to be on final approach.

AERONAUTICAL BEACON - An aeronautical ground light visible at all azimuths, either continuously or intermittently, to designate a particular point on the surface of the earth.

AERONAUTICAL CHART ― A representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation.

AERONAUTICAL INFORMATION PUBLICATION － A publication issued by or with the authority of the government and containing aeronautical information of a lasting character essential to air navigation.

AFFIRM – Yes.

AIRAC. An acronym (aeronautical information regulation and control) signifying a system aimed at advance notification based on common effective dates, of circumstances that necessitate significant changes in operating practices.

AIRCRAFT APPROACH CATEGORY － A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. An aircraft shall fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the next higher category should be used. For example, an aircraft which falls in Category A, but is circling to land at a speed in excess of 91 knots, should use the approach Category B minimums when circling to land. The categories are as follows:

a. Category A-Speed less than 91 knots.
b. Category B-Speed 91 knots or more but less than 121 knots.
c. Category C-Speed 121 knots or more but less than 141 knots.
d. Category D-Speed 141 knots or more but less than 166 knots.
e. Category E-Speed 166 knots or more.

AIR DEFENCE IDENTIFICATION ZONE － Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services (ATS).

AIRPORT- (See aerodrome)

AIRPORT LIGHTING (FAA) －Various lighting aids that may be installed on an airport. Types of airport lighting include:

a. Approach Light System (ALS)-An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach for landing. Condenser-Discharge Sequential Flashing Lights/Sequenced Flashing Lights may be installed in conjunction with the ALS at some airports. Types of Approach Light Systems are:
   1. ALSF-I. - Approach Light System with Sequenced Flashing Lights in ILS Cat-I configuration.
   2. ALSF-2. - Approach Light System with Sequenced Flashing Lights in ILS Cat- II configuration. The ALSF-2 may operate as an SSALR when weather conditions permit.
   3. SSALF. - Simplified Short Approach Light System with Runway Alignment Indicator Lights.
   4. SSALR. - Simplified Short Approach Light System with Sequenced Flashing Lights.
   5. MALSF. - Medium Intensity Approach Light System with Sequenced Flashing Lights.
   6. MALSR. - Medium Intensity Approach Light System with Runway Alignment Indicator Lights.
b. Runway Lights/Runway Edge Lights- Lights having a prescribed angle of emission used to define the lateral limits of a runway. Runway lights are uniformly spaced at intervals of approximately 200 feet, and the intensity may be controlled or preset.
c. Touchdown Zone Lighting-Two rows of transverse light bars located symmetrically about the runway centerline normally at 100 foot intervals. The basic system extends 3,000 feet along the runway.
d. Runway Centerline Lighting- Flush centerline lights spaced at 50-foot intervals beginning 75 feet from the landing threshold and extending to within 75 feet of the opposite end of the runway.
e. Threshold Lights- Fixed green lights arranged symmetrically left and right of the runway centerline, identifying the runway threshold.
f. Runway End Identifier Lights (REIL)-Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.
g. Visual Approach Slope Indicator (VASI)-An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is “on path” if he sees red/white, “above path” if white/white, and “below path” if red/red. Some airports serving large

aircraft have three-bar VASI which provide two visual glide paths to the same runway.

h. Precision Approach Path Indicator (PAPI)- An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams. The PAPI system shall consist of a wing bar of 4 sharp transition multi-lamp or paired units equally spaced. The system shall be located on the left side of the runway unless it is physically impracticable to do so. The wing bar is constructed and arranged in such a manner that a pilot making an approach will:
   1. when on or close to the approach slope, see the two units nearest to the runway as red and the two units farthest from the runway as white;
   2. when above the approach slope, see the one unit nearest the runway as red and the three units farthest from the runway as white; and when further above the approach slope, see all the units as white; and
   3. when below the approach slope, see the three units nearest the runway as red and the unit farthest from the runway as white; and when further below the approach slope, see all the units as red.

AIRPORT SURFACE DETECTION EQUIPMENT (ASDE) (FAA) － Surveillance equipment specifically designed to detect aircraft, vehicular traffic, and other objects, on the surface of an airport, and to present the image on a tower display. It is used to augment visual observation by tower personnel of aircraft and/or vehicular movements on runways and taxiways.

AIRPORT SURVEILLANCE RADAR (FAA) － Approach control radar used to detect and display an aircraft's position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

AIR TRAFFIC CONTROL AUTOMATION SYSTEM (ATMS) － A system that provides air traffic management through the collaborative integration of human resources, information, technology, facilities and services, supported by air and ground- and/or space-based communications, navigation and surveillance.

AIR TRAFFIC CONTROL CLEARANCE －Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

Note—

① For convenience, the term "air traffic control clearance" is frequently abbreviated to "clearance" when used in appropriate contexts.
② The abbreviated term "clearance" may be prefixed by the words "taxi", "take-off", "departure", "en-route", "approach" or "landing" to indicate the particular portion of flight to which the air traffic control clearance relates.

AIR TRAFFIC CONTROL INSTRUCTION － Directives issued by air traffic control for the purpose of requiring a pilot to take a specific action.

AIR TRAFFIC MANAGEMENT SYSTEM－A system that provides ATM through the collaborative integration of humans, information, technology, facilities and services, supported by air and ground- and/or space-based communications, navigation and surveillance.

AIRSPEED (FAA) - The speed of an aircraft relative to its surrounding air mass. The unqualified term "airspeed" means one of the following:

a. Indicated Airspeed- The speed shown on the aircraft airspeed indicator. This is the speed used in pilot/controller communications under the general term "airspeed."
b. True Airspeed- The airspeed of an aircraft relative to undisturbed air. Used primarily in flight planning and en route portion of flight. When used in pilot/controller communications, it is referred to as "true airspeed" and not shortened to "airspeed."

ALERTING SERVICE －A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid and assist such organizations as required.

ALONG-TRACK DISTANCE (ATD) (FAA) － The distance measured from a point-in-space by systems using area navigation reference capabilities that are not subject to slant range errors.

ALTIMETER SETTING - A pressure datum which, when set on the sub-scale of a sensitive altimeter, causes the altimeter to indicate vertical displacement from that datum. A pressure-type altimeter calibrated in accordance with Standard Atmosphere may be used to indicate altitude, height or flight levels as follows:
a. when set to QNH or Area QNH it will indicate altitude
b. when set to QFE it will indicate height above the QFE datum
c. when set to Standard Pressure (1013.2 HPA) it may be used to indicate flight levels.

ALTITUDE -The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

ALTITUDE RESERVATION － Airspace utilization under prescribed conditions normally employed for the mass movement of aircraft or other special user requirements which cannot otherwise be accomplished. ALTRVs are approved by the appropriate CAA unit.

ALTITUDE RESTRICTION－ An altitude or altitudes, stated in the order flown, which are to be maintained until reaching a specific point or time. Altitude restrictions may be issued by ATC due to traffic, terrain, or other airspace considerations.

APPROACH GATE－ An imaginary point used within ATC as a basis for vectoring aircraft to the final approach course. The gate will be established along the final approach course 1 mile from the final approach fix on the side away from the aerodrome and will be no closer than 5 miles from the landing threshold.

APPROACH SEQUENCE [ICAO] － The order in which two or more aircraft are cleared to approach to land at the aerodrome.

APPROACH SPEED -The recommended speed contained in aircraft manuals used by pilots when making an approach to land. This speed will vary for different segments of an approach as well as for aircraft weight and configuration.

APPROPRIATE AUTHORITY (ICAO) － Appropriate authority:
a. Regarding flight over the high seas: The relevant authority of the State of Registry.
b. Regarding flight other than over the high seas: The relevant authority of the State having sovereignty over the territory being overflown.

APPROPRIATE OBSTACLE CLEARANCE MINIMUM ALTITUDE－Any of the following: (See MINIMUM EN ROUTE IFR ALTITUDE.)

(See MINIMUM IFR ALTITUDE.)

(See MINIMUM OBSTRUCTION CLEARANCE ALTITUDE.)

(See MINIMUM VECTORING ALTITUDE.)

APPROPRIATE TERRAIN CLEARANCE MINIMUM ALTITUDE－ Any of the following:
(See MINIMUM EN ROUTE IFR ALTITUDE.)

(See MINIMUM IFR ALTITUDE.)

(See MINIMUM OBSTRUCTION CLEARANCE ALTITUDE.)

(See MINIMUM VECTORING ALTITUDE.)

APRON - A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, re-fuelling, parking or maintenance.

ARC - The track over the ground of an aircraft flying at a constant distance from a navigational aid, by reference to distance measuring equipment (DME).

AREA NAVIGATION (FAA) - Area Navigation (RNAV) provides enhanced navigational capability to the pilot. RNAV equipment can compute the airplane position, actual track and ground speed and then provide meaningful information relative to a route of flight selected by the pilot. Typical equipment will provide the pilot with distance, time, bearing and cross track error relative to the selected "TO" or "active" waypoint and the selected route. Several distinctly different navigational systems with different navigational performance characteristics are capable of providing area navigational functions. Present day RNAV includes INS, LORAN, VOR/DME, and GPS systems. Modern multi-sensor systems can integrate one or more of the above systems to provide a more accurate and reliable navigational system. Due to the different levels of performance, area navigational capabilities can satisfy different levels of required navigational performance (RNP). The major types of equipment are:

a. VORTAC referenced or Course Line Computer (CLC) systems, which account for the greatest number of RNAV units in use. To function, the CLC must be within the service range of a VORTAC.

b. OMEGA/VLF, although two separate systems, can be considered as one operationally. A long-range navigation system based upon Very Low Frequency radio signals transmitted from a total of 17 stations worldwide.

c. Inertial (INS) systems, which are totally self-contained and require no information from external references. They provide aircraft position and navigation information in response to signals resulting from inertial effects on components within the system.

d. MLS Area Navigation (MLS/RNAV), which provides area navigation with reference to an MLS ground facility.

e. LORAN-C is a long-range radio navigation system that uses ground waves transmitted at low frequency to provide user position information at ranges of up to 600 to 1,200 nautical miles at both en route and approach altitudes. The usable signal coverage areas are determined by the signal-to-noise ratio, the envelope-to-cycle difference, and the geometric relationship between the positions of the user and the transmitting stations.

f. GPS is a space-based radio positioning, navigation, and time-transfer system. The system provides highly accurate position and velocity information, and precise time, on a continuous global basis, to an unlimited number of properly equipped users. The system is unaffected by weather, and provides a worldwide common grid reference system.

AREA NAVIGATION [ICAO] - A method of navigation which permits aircraft operation on any desired flight path within the coverage of station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

AREA NAVIGATION (RNAV) APPROACH CONFIGURATION (FAA):

a. STANDARD T- A RNAV approach whose design allows direct flight to any one of three initial approach fixes (IAF) and eliminates the need for procedure turns. The standard design is to align the procedure on the extended centerline with the missed approach point (MAP) at the runway threshold, the final approach fix (FAF), and the initial approach/intermediate fix (IAF/IF). The other two IAFs will be established perpendicular to the IF.

b. MODIFIED T- A RNAV approach design for single or multiple runways where terrain or operational constraints do not allow for the standard T. The "T" may be modified by increasing

or decreasing the angle from the corner IAF(s) to the IF or by eliminating one or both corner IAFs.

c. STANDARD I- An RNAV approach design for a single runway with both corner IAFs eliminated. Course reversal or radar vectoring may be required at busy terminals with multiple runways.

d. TERMINAL ARRIVAL AREA (TAA) - The TAA is controlled airspace established in conjunction with the Standard or Modified T and I RNAV approach configurations. In the standard TAA, there are three areas: straight-in, left base, and right base. The arc boundaries of the three areas of the TAA are published portions of the approach and allow aircraft to transition from the en route structure direct to the nearest IAF. TAAs will also eliminate or reduce feeder routes, departure extensions, and procedure turns or course reversal.

1. STRAIGHT-IN AREA- A 30NM arc centred on the IF bounded by a straight line extending through the IF perpendicular to the intermediate course.
2. LEFT BASE AREA- A 30NM arc centred on the right corner IAF. The area shares a boundary with the straight-in area except that it extends out for 30NM from the IAF and is bounded on the other side by a line extending from the IF through the FAF to the arc.
3. RIGHT BASE AREA- A 30NM arc centred on the left corner IAF. The area shares a boundary with the straight-in area except that it extends out for 30NM from the IAF and is bounded on the other side by a line extending from the IF through the FAF to the arc.

ARMY AVIATION FLIGHT INFORMATION BULLETIN (FAA) - A bulletin that provides air operation data covering Army, National Guard, and Army Reserve aviation activities.

ARRESTING SYSTEM- A safety device consisting of two major components, namely, engaging or catching devices and energy absorption devices for the purpose of arresting both tail hook and/or non-tail hook equipped aircraft. It is used to prevent aircraft from overrunning runways when the aircraft cannot be stopped after landing or during aborted takeoff. Arresting systems have various names; e.g., arresting gear, hook device, wire barrier cable.

ARRIVAL AIRCRAFT INTERVAL (FAA) - An internally generated program in hundredths of minutes based upon the AAR. AAI is the desired optimum interval between successive arrival aircraft over the vertex.

ARRIVAL CENTER (FAA) - The ARTCC having jurisdiction for the impacted airport.

ARRIVAL DELAY (FAA) - A parameter which specifies a period of time in which no aircraft will be metered for arrival at the specified airport.

ARRIVAL SECTOR (FAA) - An operational control sector containing one or more meter fixes.

ARRIVAL SECTOR ADVISORY LIST (FAA) - An ordered list of data on arrivals displayed at the PVD/MDM of the sector which controls the meter fix.

ARRIVAL SEQUENCING PROGRAM (FAA) - The automated program designed to assist in sequencing aircraft destined for the same airport.

ARRIVAL TIME (FAA) - The time an aircraft touches down on arrival.

ASSOCIATED - A radar target displaying a data block with flight identification and altitude information.

ATC ADVISES - Used to prefix a message of non-control information when it is relayed to an aircraft by other than an air traffic controller.

ATC ASSIGNED AIRSPACE - Airspace of defined vertical/lateral limits, assigned by ATC, for the purpose of providing air traffic segregation between the specified activities being conducted within the assigned airspace

and other IFR air traffic.

ATC CLEARS - Used to prefix an ATC clearance when it is relayed to an aircraft by other than an air traffic controller.

ATC REQUESTS - Used to prefix an ATC request when it is relayed to an aircraft by other than an air traffic controller.

ATS INTERFACILITY DATA COMMUNICATIONS (AIDC) - The AIDC is an inter-centre data communications application for the exchange of tactical control information between ATS units (ATSUs). It supports critical air traffic control (ATC) functions, such as notification of flights approaching a flight information region (FIR) boundary, coordination of boundary conditions and transfer of control and communications authority.

ATS ROUTE [ICAO] - A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services.

Note— The term "ATS Route" is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure, etc.

ATS SURVEILLANCE SERVICE - Term used to indicate a service provided directly by means of an ATS surveillance system.

ATS SURVEILLANCE SYSTEM - A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

Note.— 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.

AUTOLAND APPROACH - An autoland approach is a precision instrument approach to touchdown and, in some cases, through the landing rollout. An autoland approach is performed by the aircraft autopilot which is receiving position information and/or steering commands from onboard navigation equipment.

Note— Autoland and coupled approaches are flown in VFR and IFR. It is common for carriers to require their crews to fly coupled approaches and autoland approaches (if certified) when the weather conditions are less than approximately 4,000 RVR.

AUTOMATED INFORMATION TRANSFER- A pre-coordinated process, specifically defined in facility directives, during which a transfer of altitude control and/or radar identification is accomplished without verbal coordination between controllers using information communicated in a full data block.

AUTOMATED WEATHER OBSERVATION SYSTEM (AWOS) - Automated equipment for measuring or assessing, as appropriate, and for monitoring and remote indicating of surface wind, visibility, runway visual range, height of cloud base, air and dew-point temperatures and atmospheric pressure to support approach and landing and take-off operations.

AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST (ADS-B) - A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

AUTOMATIC DEPENDENT SURVEILLANCE-CONTRACT (ADS-C) - A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via data link, specifying

under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

AUTOMATIC DIRECTION FINDER- An aircraft radio navigation system which senses and indicates the direction to an L/MF non-directional radio beacon (NDB) ground transmitter. Direction is indicated to the pilot as a magnetic bearing or as a relative bearing to the longitudinal axis of the aircraft depending on the type of indicator installed in the aircraft. In certain applications, such as military, ADF operations may be based on airborne and ground transmitters in the VHF/UHF frequency spectrum.

AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS) - The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

a. DATA LINK-AUTOMATIC TERMINAL INFORMATION SERVICE (D-ATIS). The provision of ATIS via data link.
b. VOICE-AUTOMATIC TERMINAL INFORMATION SERVICE (VOICE-ATIS). The provision of ATIS by means voice.

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B

BACK-TRACK - A term used by air traffic controllers to taxi an aircraft on the runway opposite to the traffic flow. The aircraft may be instructed to back-track to the beginning of the runway or at some point before reaching the runway end for the purpose of departure or to exit the runway.

BALLOON - A non-power-driven lighter-than-air aircraft.

BASE (LEG) – (See TRAFFIC PATTERN)

BEARING - The horizontal direction to or from any point, usually measured clockwise from true north, magnetic north, or some other reference point through 360 degrees.

BELOW MINIMUM - Weather conditions below the minimum prescribed by regulation for the particular action involved; e.g., landing minimums, takeoff minimums.

BLOCKED **-** Phraseology used to indicate that a radio transmission has been distorted or interrupted due to multiple simultaneous radio transmissions.

BRAKING ACTION (GOOD, GOOD TO MEDIUM, MEDIUM, MEDIUM TO POOR, POOR, OR LESS THAN POOR)- A report of conditions on the aerodrome movement area providing a pilot with a degree/quality of braking to expect. Braking action is reported in terms of good, good to medium, medium, medium to poor, poor, or less than poor.

BREAKOUT (FAA) - A technique to direct aircraft out of the approach stream. In the context of close parallel operations, a breakout is used to direct threatened aircraft away from a deviating aircraft.

BROADCAST - A transmission of information for which an acknowledgement is not expected.

BROADCAST (ICAO) - A transmission of information relating to air navigation that is not addressed to a specific station or stations.

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C

CARGO - Any property carried on an aircraft other than mail, stores and accompanied or mishandled baggage.

CEILING - The height above the ground or water of the base of the lowest layer of cloud below 6,000 meters (20,000 feet) covering more than half the sky.

CHAFF - Thin, narrow metallic reflectors of various lengths and frequency responses, used to reflect radar energy. These reflectors when dropped from aircraft and allowed to drift downward result in large targets on the radar display.

CIRCLE-TO-LAND MANEUVER - A maneuver to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable. At tower controlled aerodromes, this maneuver is made only after ATC authorization has been obtained and the pilot has established required visual reference to the aerodrome.

CIRCLE TO RUNWAY (RUNWAY NUMBER)- Used by ATC to inform the pilot that he/she must circle to land because the runway in use is other than the runway aligned with the instrument approach procedure. When the direction of the circling maneuver in relation to the aerodrome/runway is required, the controller will state the direction (eight cardinal compass points) and specify a left or right downwind or base leg as appropriate; e.g., "Cleared VOR Runway Three Six Approach circle to Runway Two Two," or "Circle northwest of the aerodrome for a right downwind to Runway Two Two."

CIRCLING APPROACH - An extension of an instrument approach procedure which provides for visual circling of the aerodrome prior to landing.

CLASS G AIRSPACE – Uncontrolled airspace in which IFR and VFR flights are permitted and receive flight information service if requested.

CLEAR AIR TURBULENCE (CAT)- Turbulence encountered in air where no clouds are present. This term is commonly applied to high-level turbulence associated with wind shear. CAT is often encountered in the vicinity of the jet stream.

CLEAR OF THE RUNWAY- An aircraft is clear of the runway when all parts of the aircraft are held short of, the applicable runway holding position marking or when exiting the runway, have crossed the applicable runway holding position marking.

CLEARANCE LIMIT [ICAO]- The point of which an aircraft is granted an air traffic control clearance.

CLEARANCE VOID IF NOT OFF BY (TIME) **-** Used by ATC to advise an aircraft of a CLEARANCE VOID TIME.

CLEARANCE VOID TIME - A time specified by an air traffic control unit at which a clearance ceases to be valid unless the aircraft concerned has already taken action to comply therewith.

CLEARED APPROACH - ATC authorization for an aircraft to execute any standard or special instrument approach procedure for that aerodrome.
Note— Normally, an aircraft will be cleared for a specific instrument approach procedure.

CLEARED FOR TAKEOFF - ATC authorization for an aircraft to depart. It is predicated on known traffic and known physical aerodrome conditions.

CLEARED FOR THE OPTION- ATC authorization for an aircraft to make a touch-and-go, low approach,

missed approach, stop and go, or full stop landing at the discretion of the pilot. It is normally used in training so that an instructor can evaluate a student's performance under changing situations.

CLEARED TO LAND - ATC authorization for an aircraft to land. It is predicated on known traffic and known physical aerodrome conditions.

CLIMB TO VFR- ATC authorization for an aircraft to climb to VFR conditions within Class B, C, D, and E surface areas when the only weather limitation is restricted visibility. The aircraft must remain clear of clouds while climbing to VFR.

CLOSED RUNWAY- A runway that is unusable for aircraft operations. Only the aerodrome management/military operations office can close a runway.

CLOSED TRAFFIC - Successive operations involving takeoffs and landings or low approaches where the aircraft does not exit the traffic pattern.

CODE (SSR) - The number assigned to a particular multiple pulse reply signal transmitted by a transponder in Mode A or Mode C.

COMPLY WITH RESTRICTIONS - An ATC instruction that requires an aircraft being vectored back onto an arrival or departure procedure to comply with all altitude and/or speed restrictions depicted on the procedure. This term may be used in lieu of repeating each remaining restriction that appears on the procedure.

COMPULSORY REPORTING POINTS - Reporting points which must be reported to ATC. They are designated on aeronautical charts. Pilots should discontinue position reporting over compulsory reporting points when informed by ATC that their aircraft is in identified status.

CONFLICT ALERT- A function of certain air traffic control automated systems designed to alert radar controllers to existing or pending situations between tracked targets (known IFR or VFR aircraft) that require his/her immediate attention/action.

CONTACT - Establish communication with (followed by the name of the unit and, if appropriate, the frequency to be used).

CONTROL AREA - A controlled airspace extending upwards from a specified limit above the earth.

CONTROL SECTOR - An airspace area of defined horizontal and vertical dimensions for which a controller or group of controllers has air traffic control responsibility, normally within an air route traffic control center or an approach control unit. Sectors are established based on predominant traffic flows, altitude strata, and controller workload. Pilot-communications during operations within a sector are normally maintained on discrete frequencies assigned to the sector.

CONTROLLER - A person authorized to provide air traffic control services.

COUPLED APPROACH- A coupled approach is an instrument approach performed by the aircraft autopilot which is receiving position information and/or steering commands from onboard navigation equipment. In general, coupled non-precision approaches must be discontinued and flown manually at altitudes lower than 50 feet below the minimum descent altitude, and coupled precision approaches must be flown manually below 50 feet AGL.
Note— Coupled and autoland approaches are flown in VFR and IFR. It is common for carriers to require their crews to fly coupled approaches and autoland approaches (if certified) when the weather conditions are less than approximately 4,000 RVR.

COURSE -

a. The intended direction of flight in the horizontal plane measured in degrees from north.
b. The ILS localizer signal pattern usually specified as the front course or the back course.

CROSSWIND

a. When used concerning the traffic circuit, the word means "crosswind leg." (See AERODROME TRAFFIC CIRCUIT)
b. When used concerning wind conditions, the word means a wind not parallel to the runway or the path of an aircraft.

CONTROLLED FLIGHT INTO TERRAIN (CFIT) - In-flight collision or near collision with terrain, water, or obstacle without indication of loss of control.

CRUISE (FAA)- Used in an ATC clearance to authorize a pilot to conduct flight at any altitude from the minimum IFR altitude up to and including the altitude specified in the clearance. The pilot may level off at any intermediate altitude within this block of airspace. Climb/descent within the block is to be made at the discretion of the pilot. However, once the pilot starts descent and verbally reports leaving an altitude in the block, he/she may not return to that altitude without additional ATC clearance. Further, it is approval for the pilot to proceed to and make an approach at destination aerodrome and can be used in conjunction with:

a. An aerodrome clearance limit at locations with a standard/special instrument approach procedure. The

CFRs require that if an instrument letdown to an aerodrome is necessary, the pilot shall make the letdown in accordance with a standard/special instrument approach procedure for that aerodrome, or

b. An aerodrome clearance limit at locations that are within/below/outside controlled airspace and without

a standard/special instrument approach procedure. Such a clearance is NOT AUTHORIZATION for the pilot to descend under IFR conditions below the applicable minimum IFR altitude nor does it imply that ATC is exercising control over aircraft in Class G airspace; however, it provides a means for the aircraft to proceed to destination aerodrome, descend, and land in accordance with applicable CFRs governing VFR flight operations. Also, this provides search and rescue protection until such time as the IFR flight plan is closed.

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D

DANGER AREA [ICAO]- An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

DANGEROUS GOODS - Articles or substances which are capable of posing a risk to health, safety, property or the environment.

DEAD RECKONING- Dead reckoning, as applied to flying, is the navigation of an airplane solely by means of computations based on airspeed, course, heading, wind direction, and speed, groundspeed, and elapsed time.

DEPARTURE TIME- The time an aircraft becomes airborne.

DEVIATIONS
a. A departure from a current clearance, such as an off course maneuver to avoid weather or turbulence.
b. Where specifically authorized in the FARs and requested by the pilot, ATC may permit pilots to deviate from certain regulations.

DIRECT - Straight line flight between two navigational aids, fixes, points, or any combination thereof. When used by pilots in describing off-airway routes, points defining direct route segments become compulsory reporting points unless the aircraft is under radar contact.

DIRECTION FINDER (FAA) - A radio receiver equipped with a directional sensing antenna used to take bearings on a radio transmitter. Specialized radio direction finders are used in aircraft as air navigation aids. Others are ground-based, primarily to obtain a "fix" on a pilot requesting orientation assistance or to locate downed aircraft. A location "fix" is established by the intersection of two or more bearing lines plotted on a navigational chart using either two separately located Direction Finders to obtain a fix on an aircraft or by a pilot plotting the bearing indications of his/her DF on two separately located ground-based transmitters, both of which can be identified on his/her chart. UDFs receive signals in the ultra high frequency radio broadcast band; VDFs in the very high frequency band; and UVDFs in both bands.

DIRECTLY BEHIND- An aircraft is considered to be operating directly behind when it is following the actual flight path of the lead aircraft over the surface of the earth except when applying wake turbulence separation criteria.

DISPLACED (LANDING) THRESHOLD - A threshold not located at the extremity of a runway.

DISTANCE MEASURING EQUIPMENT- Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DIVE BRAKES – (See SPEED BRAKES)

DIVERSE VECTOR AREA- In a radar environment, that area in which a prescribed departure route is not required as the only suitable route to avoid obstacles. The area in which random radar vectors below the MVA/MIA, established in accordance with the TERPS criteria for diverse departures, obstacles and terrain avoidance, may be issued to departing aircraft.

DIVERSION - Flights that are required to land at other than their original destination for reasons beyond the control of the pilot/company, e.g. periods of significant weather.
Note— The term 'diversion' can also apply to a change in track to avoid weather.

DME FIX - A geographical position determined by reference to a navigational aid which provides distance and azimuth information. It is defined by a specific distance in nautical miles and a radial, azimuth, or

course (i.e., localizer) in degrees magnetic from that aid.

DME SEPARATION - Spacing of aircraft in terms of distances (nautical miles) determined by reference to distance measuring equipment (DME).

DOWNWIND (LEG) – See Pilot/Controller Glossary “AERODROME TRAFFIC CIRCUIT”

DRAG CHUTE- A parachute device installed on certain aircraft which is deployed on landing roll to assist in deceleration of the aircraft.

E

EMERGENCY - A distress or an urgency condition.

EMERGENCY LOCATOR TRANSMITTER- A radio transmitter attached to the aircraft structure which operates from its own power source on 121.5 MHz and 243.0 MHz. It aids in locating downed aircraft by radiating a downward sweeping audio tone, 2-4 times per second. It is designed to function without human action after an accident.

ENHANCED GROUD PROXIMITY WARNING SYSTEM (EGPWS), is developed in order to overcome the GPWS limitation. This system combines accurate positional knowledge (normally determined from GPS) with a precise three dimensional map of the terrain, to look ahead of the aircraft as well as downwards. This generates warnings to the pilot if certain parameters are breached. (See also TAWS or GPWS.)

ESTABLISHED -To be stable or fixed on a route, route segment, altitude, heading, etc.

EXECUTE MISSED APPROACH- Instructions issued to a pilot making an instrument approach which means continue inbound to the missed approach point and execute the missed approach procedure as described on the Instrument Approach Procedure Chart or as previously assigned by ATC. The pilot may climb immediately to the altitude specified in the missed approach procedure upon making a missed approach. No turns should be initiated prior to reaching the missed approach point. When conducting an ASR or PAR approach, the assigned missed approach procedure is commenced immediately upon receiving instructions to "execute missed approach."

EXPEDITE - Used by ATC when prompt compliance is required to avoid the development of an imminent situation. Expedite climb/descent normally indicates to a pilot that the approximate best rate of climb/descent should be used without requiring an exceptional change in aircraft handling characteristics.

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F

FEEDER ROUTE- A route depicted on instrument approach procedure charts to designate routes for aircraft to proceed from the en route structure to the initial approach fix (IAF).

FINAL- (SEE Aerodrome traffic circuit)

FINAL APPROACH COURSE (FAA) - A bearing/radial/track of an instrument approach leading to a runway or an extended runway centreline all without regard to distance.

FINAL APPROACH FIX (FAA) - The fix from which the final approach (IFR) to an aerodrome is executed and which identifies the beginning of the final approach segment. It is designated on Government charts by the Maltese Cross symbol for nonprecision approaches and the lightning bolt symbol, designating the PFAF, for precision approaches; or when ATC directs a lower-than-published glideslope/path or vertical path intercept altitude, it is the resultant actual point of the glideslope/path or vertical path intercept.

FINAL APPROACH POINT (FAA) - The point, applicable only to a non-precision approach with no depicted FAF(such as an on aerodrome VOR), where the aircraft is established inbound on the final approach course from the procedure turn and where the final approach descent may be commenced. The FAP serves as the FAF and identifies the beginning of the final approach segment.

FINAL APPROACH SEGMENT-
(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

FINAL APPROACH SEGMENT [ICAO]- That segment of an instrument approach procedure in which alignment and descent for landing are accomplished. (See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE)

FINAL CONTROLLER - The controller providing information and final approach guidance during PAR and ASR approaches utilizing radar equipment.

FIX (FAA) - A geographical position determined by visual reference to the surface, by reference to one or more radio NAVAIDs, by celestial plotting, or by another navigational device.

FLAMEOUT - An emergency condition caused by a loss of engine power.

FLAMEOUT PATTERN- An approach normally conducted by a single-engine military aircraft experiencing loss or anticipating loss of engine power or control. The standard overhead approach starts at a relatively high altitude over a runway ("high key") followed by a continuous 180 degree turn to a high, wide position ("low key") followed by a continuous 180 degree turn final. The standard straight-in pattern starts at a point that results in a straight-in approach with a high rate of descent to the runway. Flameout approaches terminate in the type approach requested by the pilot (normally full-stop).

FLIGHT CHECK - A call-sign prefix used by CAA aircraft engaged in flight inspection/certification of navigational aids and flight procedures.

FLIGHT INSPECTION - In-flight investigation and evaluation of a navigational aid to determine whether it meets established tolerances.

FLIGHT MANAGEMENT SYSTEM - A computer system that uses a large data base to allow routes to be pre-programmed and fed into the system by means of a data loader. The system is constantly updated with respect to position accuracy by reference to conventional navigation aids. The sophisticated program and its associated data base ensures that the most appropriate aids are automatically selected during the information update cycle.

FLIGHT PATH - A line, course, or track along which an aircraft is flying or intended to be flown.

FLY HEADING (DEGREES) - Informs the pilot of the heading to be flown. The pilot may have to turn to, or continue on, a specific compass direction in order to comply with the instructions. The pilot is expected to turn in the shorter direction to the heading unless otherwise instructed by ATC.

FUEL DUMPING - Airborne release of usable fuel. This does not include the dropping of fuel tanks. Sometimes referred to as FUEL JETTISONING

FUEL REMAINING - A phrase used by either pilots or controllers when relating to the fuel remaining on board until actual fuel exhaustion. When transmitting such information in response to either a controller question or pilot advice to air traffic control, pilots will state the APPROXIMATE NUMBER OF MINUTES the flight can continue with the fuel remaining. All reserve fuel SHOULD BE INCLUDED in the time stated, as should an allowance for established fuel gauge system error.

G

GLIDESLOPE- Provides vertical guidance for aircraft during approach and landing. The glideslope/glide path is based on the following:

a. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS, or
b. Visual ground aids, such as VASI, which provide vertical guidance for a VFR approach or for the visual portion of an instrument approach and landing.
c. PAR. Used by ATC to inform an aircraft making a PAR approach of its vertical position (elevation) relative to the descent profile.

GLOBAL POSITIONING SYSTEM (GPS) - A space-based radio positioning, navigation, and time-transfer system. The system provides highly accurate position and velocity information, and precise time, on a continuous global basis, to an unlimited number of properly equipped users. The system is unaffected by weather, and provides a worldwide common grid reference system. The GPS concept is predicated upon accurate and continuous knowledge of the spatial position of each satellite in the system with respect to time and distance from a transmitting satellite to the user. The GPS receiver automatically selects appropriate signals from the satellites in view and translates these into three-dimensional position, velocity, and time. System accuracy for civil users is normally 100 meters horizontally.

GO AROUND **-** Instructions for a pilot to abandon his/her approach to landing. Additional instructions may follow. Unless otherwise advised by ATC, a VFR aircraft or an aircraft conducting visual approach should overfly the runway while climbing to traffic circuit altitude and enter the traffic circuit via the crosswind leg. A pilot on an IFR flight plan making an instrument approach should execute the published missed approach procedure or proceed as instructed by ATC; e.g., "Go around" (additional instructions if required).

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) [ICAO]− GNSS refers collectively to the worldwide positioning, navigation, and timing determination capability available from one or more satellite constellation in conjunction with a network of ground stations.

GROUND CONTROLLED APPROACH- A radar approach system operated from the ground by air traffic control personnel transmitting instructions to the pilot by radio. The approach may be conducted with surveillance radar (ASR) only or with both surveillance and precision approach radar (PAR). Usage of the term "GCA" by pilots is discouraged except when referring to a GCA unit. Pilots should specifically request a "PAR" approach when a precision radar approach is desired or request an "ASR" or "surveillance" approach when a non-precision radar approach is desired.

GROUND HANDLING. Services necessary for an aircraft’s arrival at, and departure from, an aerodrome, other than air traffic services.

GROUND PROXIMITY WARNING SYSTEM, GPWS - A ground proximity warning system (known in the FAA as Terrain Awareness and Warning System (TAWS)) is an airborne system
which usually provides pilots with warnings of the following circumstances: (See also TAWS or EGPWS.)

a. excessive descent rate;
b. excessive terrain closure rate;
c. excessive altitude loss after take-off or go-around;
d. unsafe terrain clearance while not in landing configuration;
   1. gear not locked down;
   2. flaps not in a landing position; and
e. excessive descent below the instrument glide path.

GROUND SPEED - The speed of an aircraft relative to the surface of the earth.

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H

HANDOFF- An action taken to transfer the radar identification of an aircraft from one controller to another if the aircraft will enter the accepting controller's airspace and radio communications with the aircraft will be transferred.

HELICOPTER - A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.

HELIPAD - A small, designated area, usually with a prepared surface, on a heliport, aerodrome, landing/takeoff area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters.

HELIPORT - An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

HERTZ - The standard radio equivalent of frequency in cycles per second of an electromagnetic wave. Kilohertz (kHz) is a frequency of one thousand cycles per second. Megahertz (MHz) is a frequency of one million cycles per second.

HIGH FREQUENCY - The frequency band between 3 and 30 MHz.

HIGH SPEED TAXIWAY - A long radius taxiway designed and provided with lighting or marking to define the path of aircraft, travelling at high speed (up to 60 knots), from the runway centre to a point on the centre of a taxiway. Also referred to as long radius exit or turn-off taxiway. The high speed taxiway is designed to expedite aircraft turning off the runway after landing, thus reducing runway occupancy time.

HOLD FOR RELEASE - Used by ATC to delay an aircraft for traffic management reasons; i.e., weather, traffic volume, etc. Hold for release instructions (including departure delay information) are used to inform a pilot or a controller (either directly or through an authorized relay) that an IFR departure clearance is not valid until a release time or additional instructions have been received.

HOLDING FIX - A geographical location that serves as a reference for a holding procedure.

HOLDING POINT [ICAO] - A specified location, identified by visual or other means, in the vicinity of which the position of an aircraft in flight is maintained in accordance with air traffic control clearances.
Note— In radiotelephony phraseologies, the expression HOLDING POINT, is used to designate the RUNWAY HOLDING POSITION (See also RUNWAY HOLDING POSITION)

HOMING (FAA) - Flight toward a NAVAID, without correcting for wind, by adjusting the aircraft heading to maintain a relative bearing of zero degrees.

Intentionally Blank

I

ICING - The accumulation of airframe ice. Types of icing are:

a. Rime Ice - Rough, milky, opaque ice formed by the instantaneous freezing of small supercooled water droplets.
b. Clear Ice - A glossy, clear, or translucent ice formed by the relatively slow freezing or large supercooled water droplets.
c. Mixed- A mixture of clear ice and rime ice.

Intensity of icing:

a. Trace - Ice becomes perceptible. Rate of accumulation is slightly greater than the rate of sublimation. De-icing/anti-icing equipment is not utilized unless encountered for an extended period of time (over 1 hour).
b. Light - The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of de-icing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the de-icing/anti-icing equipment is used.
c. Moderate - The rate of accumulation is such that even short encounters become potentially hazardous and use of de-icing/anti-icing equipment or flight diversion is necessary.
d. Severe - The rate of accumulation is such that de-icing/anti-icing equipment fails to reduce or control the hazard. Immediate flight diversion is necessary.

IDENT− A request for a pilot to activate the aircraft transponder identification feature. This will help the controller to confirm an aircraft identity or to identify an aircraft.

IDENT FEATURE- The special feature in the Air Traffic Control Radar Beacon System (ATCRBS) equipment. It is used to immediately distinguish one displayed beacon target from other beacon targets.

IF NO TRANSMISSION RECEIVED FOR (TIME)- Used by ATC in radar approaches to prefix procedures which should be followed by the pilot in event of lost communications.

IFR FLIGHT - An aircraft conducting flight in accordance with instrument flight rules.

IFR CONDITIONS (FAA) - Weather conditions below the minimum for flight under visual flight rules.

IMMEDIATELY- Used by ATC or pilots when such action compliance is required to avoid an imminent situation.

INCERFA -The code word used to designate an uncertainty phase.

INERTIAL NAVIGATION SYSTEM - An RNAV system which is a form of self-contained navigation.

INITIAL APPROACH FIX- The fixes depicted on instrument approach procedure charts that identify the beginning of the initial approach segment(s).

INITIAL APPROACH SEGMENT -
REFERENCE— Para 1-3-1.

INSTRUMENT FLIGHT RULES FLIGHT – A flight conducted in accordance with the instrument flight rules.

INSTRUMENT FLIGHT RULES - Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan. (See also FARS)

INSTRUMENT LANDING SYSTEM(FAA)- A precision instrument approach system which normally consists of the following electronic components and visual aids:
a. Localizer.
b. Glide path.

c. Outer Marker.
d. Middle Marker.
e. Approach Lights.

INSTRUMENT RUNWAY - One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

a. Non-precision Approach Runway-An instrument runway served by visual aids and a non-visual aid providing at least directional guidance adequate for a straight-in approach.
b. Precision Approach Runway, Category I- A runway served by visual aids and non-visual aid(s) intended for landing operations with a decision height (DH) not lower than 60 m(200 ft) and either a visibility not less than 800 m or a runway visual range not less than 550 m.
c. Precision Approach Runway, Category II-An instrument runway served by ILS and visual aids intended for landing operations with a decision height (DH) lower than 60 m (200 ft)but not lower than 30 m (100 ft) and a runway visual range not less than 300 m.
d. Precision Approach Runway, Category III- An instrument runway served by visual aids and non-visual aid(s) intended for landing operations to and along the surface of the runway and:
   A. Intended for operations with a decision height (DH) lower than 30 m (100 ft), or no decision height and a runway visual range not less than 175 m.
   B. Intended for operations with a decision height (DH) lower than 15 m (50 ft), or no decision height and a runway visual range less than 175 m but not less than 50 m.
   C. Intended for operations with no decision height (DH) and no runway visual range limitations.

Note—

① See Annex 10 Volume I, Part I, Chapter 3, for related ILS specifications.

② Visual aids need not necessarily be matched to the scale of non-visual aids provided. The criterion for the selection of visual aids is the conditions in which operations are intended to be conducted.

INTERMEDIATE APPROACH SEGMENT - That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, race track or dead reckoning track procedure and the final approach fix or point, as appropriate.

INTERMEDIATE APPROACH FIX- The fix that identifies the beginning of the intermediate approach segment of an instrument approach procedure. The fix is not normally identified on the instrument approach chart as an intermediate fix (IF).

INTERNATIONAL CIVIL AVIATION ORGANIZATION [ICAO]- A UN specialized agency, established by States in 1944 to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention).ICAO works with the Convention's Member States and industry groups to reach consensus on international civil aviation Standards and Recommended Practices (SARPs) and policies in support of a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector.

INTERROGATOR- The ground-based surveillance radar beacon transmitter-receiver, which normally scans in synchronism with a primary radar, transmitting discrete radio signals which repetitiously request all transponders on the mode being used to reply. The replies received are mixed with the primary radar returns and displayed on the same plan position indicator (radar scope). It is also, applied to the airborne element of the TACAN/DME system.

INTERSECTION-

a. A point defined by any combination of courses, radials, or bearings of two or more navigational aids.
b. Used to describe the point where two runways, a runway and a taxiway, or two taxiways cross or meet.

INTERSECTION DEPARTURE- A departure from any runway intersection except the end of the runway.

J

JET BLAST- Jet engine exhaust (thrust stream turbulence).

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K

KNOWN TRAFFIC - Aircraft whose altitude, position, and intentions are known to ATC.

Intentionally Blank

L

LANDING MINIMUM - The minimum visibility prescribed for landing a civil aircraft while using an instrument approach procedure. The minimum applies with other limitations set forth in the AIP Taipei FIR with respect to the Minimum Descent Altitude (MDA) or Decision Height (DH) prescribed in the instrument approach procedures as follows:

a. Straight-in landing minimums. A statement of MDA and visibility, or DH and visibility, required for a straight-in landing on a specified runway, or
b. Circling minimums. A statement of MDA and visibility required for the circle-to-land manoeuvre.

Note— Descent below the established MDA or DH is not authorized during an approach unless the aircraft is in a position from which a normal approach to the runway of intended landing can be made and adequate visual reference to required visual cues is maintained.

LANDING ROLL - The distance from the point of touchdown to the point where the aircraft can be brought to a stop or exit the runway.

LANDING SEQUENCE - The order in which aircraft are positioned for landing.

LAST ASSIGNED LEVEL- The last altitude/flight level assigned by ATC and acknowledged by the pilot.

LATERAL SEPARATION - The lateral spacing of aircraft at the same altitude by requiring operation on different routes or in different geographical locations.

LETTERS OF AGREEMENT (LOA) - Letters of agreement detail specific agreements between facilities and between neighbouring States on such matters as airspace management, traffic management, coordination, transfer of control and information transfer.

LIGHTER-THAN-AIR AIRCRAFT. Any aircraft supported chiefly by its buoyancy in the air.

LIGHT GUN - A handheld directional light signalling device which emits a brilliant narrow beam of white, green, or red light as selected by the tower controller. The colour and type of light transmitted can be used to approve or disapprove anticipated pilot actions where radio communication is not available. The light gun is used for controlling traffic operating in the vicinity of the aerodrome and on the aerodrome movement area.

LOCAL TRAFFIC (FAA) - Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the aerodrome.

LOCALIZER - The component of an ILS which provides course guidance to the runway.

LOCALIZER PERFORMANCE APPROACH WITH VERTICAL GUIDANCE (LPV) (FAA) - A type of approach with vertical guidance (APV) based on WAAS, published on RNAV (GNSS) approach charts. This procedure takes advantage of the precise lateral guidance available from WAAS. The minima is published as a decision altitude (DA).

LOCATOR - An LM/MF NDB used as an aid to final approach.
Note— A locator usually has an average radius of rated coverage of between 18.5 and 46.3 km (10 and 25 NM).

LONGITUDINAL SEPARATION - The longitudinal spacing of aircraft at the same altitude by a minimum distance expressed in units of time or miles.

LORAN- An electronic navigational system by which hyperbolic lines of position are determined by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran A operates in the 1750-1950 kHz frequency band. Loran C and D operate in the 100-110 kHz frequency band.

LOST COMMUNICATIONS- Loss of the ability to communicate by radio. Aircraft are sometimes referred to as NORDO (No Radio). Standard pilot procedures are specified in FAR. Radar controllers issue procedures for pilots to follow in the event of lost communications during a radar approach when weather reports indicate that an aircraft will likely encounter IFR weather conditions during the approach.

LOW APPROACH- An approach over an aerodrome or runway following an instrument approach or a VFR approach including the go-around manoeuvre where the pilot intentionally does not make contact with the runway.

LOWEST USABLE LEVEL - The lowest level/altitude available for use which provides the required clearance with terrain.

LOW FREQUENCY- The frequency band between 30 and 300 kHz.

M

MACH NUMBER- The ratio of true airspeed to the speed of sound; e.g., MACH .82.

MAINTAIN - “Continue in accordance with the condition(s) specified” or in its literal sense, e.g. “Maintain VFR”

MAKE SHORT APPROACH **-** Used by ATC to inform a pilot to alter his/her traffic pattern so as to make a short final approach.

MAYDAY - The international radiotelephony distress signal. It indicates imminent and grave danger and that immediate assistance is requested. It is normally repeated three times.

MERGING TARGET PROCEDURES – Specified circumstances requiring the issue of traffic information and radar vectoring when radar targets are likely to merge.

MICROBURST - A small downburst with outbursts of damaging winds extending 2.5 miles or less. In spite of its small horizontal scale, an intense microburst could induce wind speeds as high as 150 knots

MINIMUM CROSSING ALTITUDE - The lowest altitude at certain fixes at which an aircraft must cross when proceeding in the direction of a higher minimum en route IFR altitude (MEA).

MINIMUM DESCENT ALTITUDE - The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glideslope is provided.

MINIMUM EN ROUTE IFR ALTITUDE (MEA) - The lowest published altitude between radio fixes which assures acceptable navigational signal coverage and meets obstacle clearance requirements between those fixes. The MEA prescribed for a Federal airway or segment thereof, area navigation low or high route, or other direct route applies to the entire width of the airway, segment, or route between the radio fixes defining the airway, segment, or route.

MINIMUM IFR FLIGHT ALTITUDE - The lowest published altitude, or where no such minimum has been established:

a. over high terrain or in mountainous areas at a level which is at least 2000ft above the highest obstacle located within 5 miles of the estimated position of the aircraft;
b. elsewhere than as specified in (1) at a level which is at least 1000ft above the highest obstacle located within 5 miles of the estimated position of the aircraft

MINIMUM HOLDING ALTITUDE- The lowest altitude prescribed for a holding pattern which assures navigational signal coverage, communications, and meets obstacle clearance requirements.

MINIMUM NAVIGATION PERFORMANCE SPECIFICATION (FAA) - A set of standards which require aircraft to have a minimum navigation performance capability in order to operate in MNPS designated airspace. In addition, aircraft must be certified by their State of Registry for MNPS operation.

MINIMUM OBSTRUCTION CLEARANCE ALTITUDE (MOCA)- The lowest published altitude in effect between radio fixes on VOR airways, off-airway routes, or route segments which meets obstacle clearance requirements for the entire route segment and which assures acceptable navigational signal coverage only within 25 statute (22 nautical) miles of a VOR.

MINIMUM RECEPTION ALTITUDE (FAA) - The lowest altitude at which an intersection can be determined.

MINIMUM SAFE ALTITUDE (FAA) –

a. The minimum altitude specified in 14 CFR Part 91 for various aircraft operations.

b. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance for emergency use within a specified distance from the navigation facility upon which a procedure is predicated. These altitudes will be identified as Minimum Sector Altitudes and are established as follows:

1. Minimum Sector Altitudes. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance within a 25-mile radius of the navigation facility upon which the procedure is predicated. Sectors depicted on approach charts must be at least 90 degrees in scope. These altitudes are for emergency use only and do not necessarily assure acceptable navigational signal coverage.

2. Emergency Safe Altitudes. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance in nonmountainous areas and 2,000 feet of obstacle clearance in designated mountainous areas within a 100-mile radius of the navigation facility upon which the procedure is predicated and normally used only in military procedures. These altitudes are identified on published procedures as "Emergency Safe Altitudes."

MINIMUM SAFE ALTITUDE WARNING - A function of the radar system computer that aids the controller by alerting him/her when a tracked Mode C equipped aircraft is below or is predicted by the computer to go below a predetermined minimum safe altitude.

MINIMUM SECTOR ALTITUDE - The lowest altitude which may be used which will provide a minimum clearance of 300 m (1,000 feet) above all obstacles located in an area contained within a sector of a circle of 46 km (25 NM) radius centered on a radio aid to navigation.

MINIMUM - Weather condition requirements established for a particular operation or type of operation; e.g., IFR takeoff or landing, alternate aerodrome for IFR flight plans, VFR flight, etc.

MINIMUM VECTORING ALTITUDE (MVA) - The lowest MSL altitude at which an IFR aircraft will be vectored by a radar controller, except as otherwise authorized for radar approaches, departures, and missed approaches. The altitude meets IFR obstacle clearance criteria. It may be lower than the published MEA along an airway or route segment. It may be utilized for radar vectoring identified aircraft only upon the controller's determination that an adequate radar return is being received from the aircraft being controlled. Charts depicting minimum vectoring altitudes are normally available only to the controllers and not to pilots.

MISSED APPROACH-

a. A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. The route of flight and altitude are shown on instrument approach procedure charts. A pilot executing a missed approach prior to the Missed Approach Point (MAP) must continue along the final approach to the MAP.

b. A term used by the pilot to inform ATC that he/she is executing the missed approach.

c. At locations where ATC radar service is provided, the pilot should conform to radar vectors when provided by ATC in lieu of the published missed approach procedure.

MISSED APPROACH POINT - A point prescribed in each instrument approach procedure at which a missed approach procedure shall be executed if the required visual reference does not exist.

MODE (SSR MODE) - The letter or number assigned to a specific pulse spacing of the interrogation signals transmitted by an interrogator. There are four modes specified in Annex 10: A, C, S and intermode. Military use Mode 3.

MODE C INTRUDER ALERT - A function of certain air traffic control automated systems designed to alert radar controllers to existing or pending situations between a tracked target (known IFR or VFR aircraft) and an untracked target (unknown IFR or VFR aircraft) that requires immediate attention/action.

MONITOR (When used for communications) - “Listen out on (frequency).”

MOVING TARGET INDICATOR - An electronic device which will permit radar scope presentation only from targets which are in motion. A partial remedy for ground clutter.

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N

NAVAID CLASSES- VOR, VORTAC, and TACAN aids are classed according to their operational use. The three classes of Navaids are:

a. T- Terminal.
b. L- Low altitude.
c. H- High altitude.

NAVIGATION AID - Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight.

NEGATIVE **-** "No," or "Permission not granted," or "That is not correct" or "Not capable"."

NIGHT (Rules of the Air) - The hours between the end of evening civil twilight and the beginning of morning civil twilight.

NO GYRO APPROACH - A radar approach/vector provided in case of a malfunctioning gyro-compass or directional gyro. Instead of providing the pilot with headings to be flown, the controller observes the radar track and issues control instructions "turn right/left" or "stop turn" as appropriate.

NON-DIRECTIONAL BEACON (NDB)- An L/MF or UHF radio beacon transmitting non-directional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and "home" on or track to or from the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NON-RADAR- Precedes other terms and generally means without the use of radar, such as:
a. Non-radar Approach. Used to describe instrument approaches for which course guidance on final approach is not provided by ground-based precision or surveillance radar. Radar vectors to the final NDB, TACAN, and ILS approaches.
b. Non-radar Approach Control. An ATC unit providing approach control service without the use of radar.
c. Non-radar Arrival. An aircraft arriving at an aerodrome without radar service or at an aerodrome served by a radar unit and radar contact has not been established or has been terminated due to a lack of radar service to the aerodrome.
d. Non-radar Route. A flight path or route over which the pilot is performing his/her own navigation. The pilot may be receiving radar separation, radar monitoring, or other ATC services while on a non-radar route.
e. Non-radar separation. The separation used when aircraft position information is derived from sources other than radar.
(See also ICAO definition of 'Procedural control)

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O

OBSTACLE - All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in-flight.

OBSTRUCTION - Any object/obstacle exceeding the obstruction standards specified by the regulations governing the prohibition and restriction for construction around the aerodrome, airfield and navigation aid.

OBSTRUCTION LIGHT - A light or one of a group of lights, usually red or white, frequently mounted on a surface structure or natural terrain to warn pilots of the presence of an obstruction.

OUT - “This exchange of transmissions is ended and no response is expected.”

OUTER FIX - A general term used within ATC to describe fixes in the terminal area, other than the final approach fix.

OUTER MARKER (FAA) - A marker beacon at or near the glideslope intercept altitude of an ILS approach. It is keyed to transmit two dashes per second on a 400 Hz tone, which is received aurally and visually by compatible airborne equipment. The OM is normally located four to seven miles from the runway threshold on the extended centreline of the runway.

OVER – **“**My transmission is ended; I expect a response.”
Note— Not normally used in VHF communications.

OVERHEAD MANOEUVRE- A series of predetermined maneuvers prescribed for aircraft (often in formation) for entry into the visual flight rules (VFR) traffic pattern and to proceed to a landing. An overhead maneuver is not an instrument flight rules (IFR) approach procedure. An aircraft executing an overhead maneuver is considered VFR and the IFR flight plan is cancelled when the aircraft reaches the "initial point" on the initial approach portion of the maneuver. The pattern usually specifies the following:

a. The radio contact required of the pilot.
b. The speed to be maintained.
c. An initial approach 3 to 5 miles in length.
d. An elliptical pattern consisting of two 180 degree turns.
e. A break point at which the first 180 degree turn is started.
f. The direction of turns.
g. Altitude (at least 500 feet above the conventional pattern).
h. A "Roll-out" on final approach not less than 1/4 mile from the landing threshold and not less than 300 feet above the ground.

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P

PAN-PAN - The international radio-telephony urgency signal which indicates uncertainty or alert followed, by the nature of the urgency. It is normally repeated three times.

PARALLEL RUNWAYS - Two or more runways at the same aerodrome whose centerlines are parallel. In addition to runway number, parallel runways are usually designated as L (left) and R (right) or, if three parallel runways exist, L (left), C (center), and R (right).

POINT OUT - An 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.

POSITION REPORT - A report containing the time and level of passing a known location, together with any other required information.

POSITION SYMBOL - A computer-generated indication shown on a radar display to indicate the mode of tracking.

PRACTICE INSTRUMENT APPROACH - An instrument approach procedure conducted by a VFR or an IFR aircraft for the purpose of pilot training or proficiency demonstrations.

PRE-DEPARTURE CLEARANCE - An application with the Terminal Data Link System (TDLS) that provides clearance information to subscribers, through a service provider, in text to the cockpit or gate printer.

PREARRANGED COORDINATION PROCEDURES - A unit's standardized procedure that describes the process by which one controller shall allow an aircraft to penetrate or transit another controller's airspace in a manner that assures separation without individual coordination for each aircraft.

PRECIPITATION - Any or all forms of water particles (rain, sleet, hail, or snow) that fall from the atmosphere and reach the surface.

PRIMARY RADAR TARGET - An analogue or digital target, exclusive of a secondary radar target, presented on a radar display.

PROGRESSIVE TAXI - Precise taxi instructions given to a pilot unfamiliar with the aerodrome or issued in stages as the aircraft proceeds along the taxi route.

PROHIBITED AREA - An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

PROPOSED DEPARTURE TIME- The time that the aircraft expects to become airborne.

PUBLISHED ROUTE- A route for which an IFR altitude has been established and published.

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Q

QFE – The atmospheric pressure at aerodrome elevation (or at runway threshold). When set on an altimeter, the altimeter will show height above the aerodrome elevation (or runway threshold). (See ALTIMETER SETTING.)

QNH - The barometric pressure as reported by a particular station, that is, the station atmospheric pressure corrected to mean sea level. When set on an altimeter it will show altitude. (See Altimeter Setting.)

QUADRANT- A quarter part of a circle, centred on a NAVAID, oriented clockwise from magnetic north as follows: NE quadrant 000-089, SE quadrant 090-179, SW quadrant 180-269, NW quadrant 270-359.

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R

RADAR ADVISORY - The provision of advice and information based on radar observations.

RADAR ARRIVAL - An aircraft arriving at an aerodrome served by a radar unit and in radar contact with the unit.

RADAR CONTACT LOST –Used by ATC to inform a pilot that radar data used to determine the aircraft's position is no longer being received, or is no longer reliable and radar service is no longer being provided. The loss may be attributed to several factors including the aircraft merging with weather or ground clutter, the aircraft operating below radar line of sight coverage, the aircraft entering an area of poor radar return, failure of the aircraft transponder, or failure of the ground radar equipment.

RADAR ENVIRONMENT - An area in which radar service may be provided.

RADAR IDENTIFIED AIRCRAFT - An aircraft, the position of which has been correlated with an observed target or symbol on the radar display.

RADAR SERVICE TERMINATED - Used by ATC to inform a pilot that he/she will no longer be provided any of the services that could be received while in radar contact.

RADAR SURVEILLANCE - The radar observation of a given geographical area for the purpose of performing some radar function.

RADAR TRAFFIC INFORMATION - Information issued to alert pilots to known or observed radar traffic which may affect the intended route of flight of their aircraft.

RADIAL - A magnetic bearing extending from a VOR/VORTAC/TACAN navigation facility.

RADIO-

a. A device used for communication.
b. Used to refer to Air/Ground station.

READ BACK - “Repeat all, or the specified part, of this message back to me exactly as received.”

RELEASE TIME - Time prior to which an aircraft should be given further clearance or prior to which it should not proceed in case of radio failure.

REPORT- “Pass me the following information...”; e.g. *"Report passing ANBU VOR."*

RESOLUTION ADVISORY-A display indication given to the pilot by the traffic alert and collision avoidance systems (TCAS II) recommending a maneuver to increase vertical separation relative to an intruding aircraft. Positive, negative, and vertical speed limit (VSL) advisories constitute the resolution advisories. A resolution advisory is also classified as corrective or preventive.

RESTRICTED AREA - An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

RESUME OWN NAVIGATION - Used by ATC to advise a pilot to resume his/her own navigational responsibility. It is issued after completion of a radar vector or when radar contact is lost while the aircraft is being radar vectored.

RNAV APPROACH - An instrument approach procedure which relies on aircraft area navigation equipment for navigational guidance.

ROGER - **“**I have received all of your last transmission”. It should not be used to answer a question requiring a yes or a no answer.

Note — Under no circumstances to be used in reply to a question requiring "READ BACK" or a direct answer in the affirmative (AFFIRM) or negative (NEGATIVE).

ROUTE- A defined path, consisting of one or more courses in a horizontal plane, which aircraft traverse over the surface of the earth.

ROUTE SEGMENT (FAA) - As used in Air Traffic Control, a part of a route that can be defined by two navigational fixes, two Navaids, or a fix and a Navaid.

RUNWAY CONDITION CODE (RWYCC)- A number describing the runway surface condition to be used in the runway condition report.
Note.— The purpose of the runway condition code is to permit an operational aeroplane performance calculation by the flight crew. Procedures for the determination of the runway condition code are described in the PANS-Aerodromes (ICAO Doc 9981).

RUNWAY CONDITION REPORT (RCR)- A comprehensive standardized report relating to runway surface condition(s) and its effect on the aeroplane landing and take-off performance.

RUNWAY HEADING **-** The magnetic direction that corresponds with the runway centreline extended, not the painted runway number. When cleared to "fly or maintain runway heading," pilots are expected to fly or maintain the heading that corresponds with the extended centreline of the departure runway. Drift correction shall not be applied; e.g., Runway 4, actual magnetic heading of the runway centreline 044, fly 044.

RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY (FAA) - Any runway or runways currently being used for takeoff or landing. When multiple runways are used, they are all considered active runways. In the metering sense, a selectable adapted item which specifies the landing runway configuration or direction of traffic flow. The adapted optimum flight plan from each transition fix to the vertex is determined by the runway configuration for arrival metering processing purposes.

S

SAFETY ALERT - A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller's judgment, places the aircraft in unsafe proximity to terrain, obstructions, or other aircraft. The controller may discontinue the issuance of further alerts if the pilot advises he/she is taking action to correct the situation or has the other aircraft in sight.

a. Terrain/Obstruction Alert - A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller's judgment, places the aircraft in unsafe proximity to terrain/obstructions; e.g., "Low Altitude Alert, check your altitude immediately."
b. Aircraft Conflict Alert - A safety alert issued by ATC to aircraft under their control if ATC is aware of an aircraft that is not under their control at an altitude which, in the controller's judgment, places both aircraft in unsafe proximity to each other. With the alert, ATC will offer the pilot an alternate course of action when feasible; e.g., "Traffic Alert, advise you turn right heading zero niner zero or climb to eight thousand immediately."

Note— The issuance of a safety alert is contingent upon the capability of the controller to have an awareness of an unsafe condition. The course of action provided will be predicated on other traffic under ATC control. Once the alert is issued, it is solely the pilot's prerogative to determine what course of action, if any, he/she will take.

SAY AGAIN **-** "Repeat all, or the following part, of your last transmission." e.g., "Say again all after AN BU VOR."

SEARCH AND RESCUE - A service which seeks missing aircraft and assists those found to be in need of assistance. It is a cooperative effort using the facilities and services of available military and local agencies. Information pertinent to search and rescue should be passed through any air traffic unit or be transmitted directly to the Rescue Coordination Center by telephone.

SELECTIVE CALLING SYSTEM (SELCAL) - SELCAL is a system which replaces voice calling by the transmission of coded tones to an aircraft over the HF radiotelephony channels. A single selective call consists of a combination of four pre-selected audio tones whose transmission requires approximately 2 seconds. The tones are generated in the aeronautical station coder and are received by a decoder connected to the audio output of the airborne receiver. Receipt of the assigned tone code (SELCAL code) activates a cockpit call system in the form of light and/or chime signals.

SEPARATION MINIMA - The minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures.

SHORT RANGE CLEARANCE — A clearance issued to a departing IFR flight which authorizes IFR flight to a specific fix short of the destination while air traffic control facilities are coordinating and obtaining the complete clearance.

SIDESTEP MANOEUVRE— A visual maneuver accomplished by a pilot at the completion of an instrument approach to permit a straight-in landing on a parallel runway not more than 1,200 feet to either side of the runway to which the instrument approach was conducted.

SIMULATED FLAMEOUT - A practice approach by a jet aircraft (normally military) at idle thrust to a runway. The approach may start at a runway (high key) and may continue on a relatively high and wide downwind leg with a continuous turn to final. It terminates in landing or low approach. The purpose of this approach is to simulate a flameout.

SIMULTANEOUS ILS APPROACHES (FAA) - An approach system permitting simultaneous ILS/MLS approaches to aerodromes having parallel runways separated by at least 4,300 feet between centrelines. Integral

parts of a total system are ILS/MLS, radar, communications, ATC procedures, and appropriate airborne equipment.

SINGLE FREQUENCY APPROACH — A service provided under a letter of agreement to military single-piloted turbojet aircraft which permits use of a single UHF frequency during approach for landing. Pilots will not normally be required to change frequency from the beginning of the approach to touchdown except that pilots conducting an en route descent are required to change frequency when control is transferred from the air route traffic control center to the terminal unit.

SPEAK SLOWER - “Reduce your rate of speech.”

SPECIAL VFR CONDITIONS - Ceiling not less than 500ft and visibility not less than 1500m.

SPECIAL VFR FLIGHT (FAR) - A VFR flight requested by pilot and cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

SPEED ADJUSTMENT(FAA)- An ATC procedure used to request pilots to adjust aircraft speed to a specific speed, or greater or less than a specific speed, for the purpose of providing desired spacing. Pilots are expected to maintain a speed of plus or minus 10 knots or 0.02 Mach number of any specified speed.

SPEED BRAKES - Moveable aerodynamic devices on aircraft that reduce airspeed during descent and landing.

SPEED SEGMENTS - Portions of the arrival route between the transition point and the vertex along the optimum flight path for which speeds and altitudes are specified. There is one set of arrival speed segments adapted from each transition point to each vertex. Each set may contain up to six segments.

SQUAWK (Mode, Code, Function) - Activate specific modes/codes/functions on the aircraft transponder; e.g., "Squawk three/alpha, two one zero five, low."

STAND BY - “Wait and I will call you.”

STOP AND GO — A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point.

STOP SQUAWK CHARLIE WRONG INDICATION **-** Used by ATC to inform an aircraft to turn-off the automatic altitude reporting feature of its transponder. It is issued when the verbally reported altitude varies 300 feet or more from the automatic altitude report.

STRAIGHT-IN APPROACH - An instrument approach wherein final approach is begun without first having executed a procedure turn, not necessarily completed with a straight-in landing or made to straight-in landing minimums.

STRAIGHT-IN LANDING —A landing made on a runway which the aligned angle of the final approach course with runway centreline extension, and the descent rate meet the procedure design criteria of a straight-in landing.

SURFACE AIRSPACE — The controlled airspace designated for an aerodrome that begins at the surface and extends upward to a specified upper limit, including Class C, D, and E surface airspace.

Note — The term 'SURFACE AIRSPACE is equivalent to the term CONTROL ZONE as used in the Rules of the AIR.

SURVEILLANCE APPROACH — An instrument approach wherein the air traffic controller issues instructions, for pilot compliance, based on aircraft position in relation to the final approach course (azimuth), and the distance (range) from the end of the runway as displayed on the controller's radar scope. The controller will provide recommended altitudes on final approach if requested by the pilot.

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T

TACAN-ONLY AIRCRAFT - An aircraft, normally military, possessing TACAN with DME but no VOR navigational system capability. Clearances must specify TACAN or VORTAC fixes and approaches.

TAILWIND - Any wind more than 90 degrees to the longitudinal axis of a runway or direction of flight.

TAKE-OFF DISTANCE AVAILABLE - The length of the take-off run available plus the length of the clearway, if provided.

TAKE-OFF RUN AVAILABLE - The length of runway declared available and suitable for the ground run of an aeroplane take-off.

TARGET - In radar:

a. Generally, any discrete object which reflects or retransmits energy back to the radar equipment.
b. Specifically, an object of radar search or surveillance.

TARGET SYMBOL - A computer-generated indication shown on a radar display resulting from a primary radar return or a radar beacon reply.

TERMINAL AREA - A general term used to describe airspace in which approach control service or aerodrome traffic control service is provided.

TERRAIN - The surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles.
Note.— In practical terms, depending on the method of data collection, terrain represents the continuous surface that exists at the bare Earth, the top of the canopy or something in between, also known as "first reflective surface"
.
Terrain Awareness and Warning System (TAWS)(FAA) - a generic term used to describe an alerting system that provides the flight crew with sufficient information and time to detect a potentially hazardous terrain situation and avoid CFIT. (See also GPWS or EGPWS.)

TIMED APPROACH PROCEDURES - Procedures in which approaching aircraft are given a time at which to pass a specified point inbound, which is determined with the aim of achieving the desired interval between successive landings on the runway, while respecting the applicable separation minima at all times, including the period of runway occupancy.

TOUCH-AND-GO - An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway.

TOUCHDOWN ZONE - The first 3,000 feet of the runway beginning at the threshold. The area is used for determination of Touchdown Zone Elevation in the development of straight-in landing minimums for instrument approaches.

TOUCHDOWN ZONE (ICAO)- The portion of a runway, beyond the threshold, where it is intended landing aeroplane first contact the runway.

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

a. In response to a handoff or point out,
b. In anticipation of a handoff or point out, or
c. In conjunction with a request for control of an aircraft.
d. A term used by ATC to refer to one or more aircraft.

TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM - An airborne collision avoidance system based

on radar beacon signals which operates independent of ground-based equipment. TCAS-I generates traffic advisories only. TCAS-II generates traffic advisories, and resolution (collision avoidance) advisories in the vertical plane.

TRAFFIC IN SIGHT - Used by pilots to inform a controller that previously issued traffic is in sight.

TRAFFIC NO FACTOR - Indicates that the traffic described in a previously issued traffic advisory is no factor.

TRANSFER OF CONTROL - Transfer of responsibility for providing air traffic control service.

TRANSITION

a. The general term that describes the change from one phase of flight or flight condition to another; e.g., transition from en route flight to the approach or transition from instrument flight to visual flight.
b. A type of airway used to connect airways or routes usually as a shortcut, for the purpose of avoiding congested area or re-routing traffic flow.

TRANSPONDER - A receiver/transmitter which will generate a reply signal upon proper interrogation; the interrogation and reply being on different frequencies.

TREND FORECAST - A trend forecast consists of a concise statement of the expected significant changes in the meteorological conditions at an aerodrome to be appended to a local routine or local special report, or a METAR or SPECI. The period of validity of a trend forecast is 2 hours.

TURBOJET AIRCRAFT- An aircraft having a jet engine in which the energy of the jet operates a turbine which in turn operates the air compressor.

TURBOPROP AIRCRAFT - An aircraft having a jet engine in which the energy of the jet operates a turbine which drives the propeller.

U

UNLAWFUL INTERFERENCE (Acts of) - These are acts or attempted acts such as to jeopardize the safety of civil aviation and air transport, i.e.:

a. unlawful seizure of aircraft in flight,
b. unlawful seizure of aircraft on the ground,
c. hostage-taking on board aircraft or on aerodromes,
d. forcible intrusion on board an aircraft, at an aerodrome or on the premises of an aeronautical unit,
e. introduction on board an aircraft or at an aerodrome of a weapon or hazardous device or material intended for criminal purposes,
f. communication of false information such as to jeopardize the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an aerodrome or on the premises of a civil aviation unit.

ULTRAHIGH FREQUENCY - The frequency band between 300 and 3,000 MHz. The bank of radio frequencies used for military air/ground voice communications. In some instances this may go as low as 225 MHz and still be referred to as UHF.

UNABLE- “I cannot comply with your request, instruction, or clearance.”
Note— UNABLE is normally followed by a reason.

UNIT DIRECTIVE- Unit Directives contain instructions from ATS management to operational staff at an air traffic unit. The directives may expand on, or be additional to, procedures contained in the ATMP
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UNPUBLISHED ROUTE - A route for which no minimum altitude is published or charted for pilot use. It may include a direct route between NAVAIDs, a radial, a radar vector, or a final approach course beyond the segments of an instrument approach procedure.

UNRELIABLE (GNSS/WAAS) - An advisory to pilots indicating the expected level of service of the NSS and/or WAAS may not be available. Pilots must then determine the adequacy of the signal for desired use.

UPWIND LEG - (See A REODROME TRAFFIC CIRCUIT)

URGENCY - A condition concerning the safety of an aircraft or other vehicle, or of person onboard or in sight, but which does not require immediate assistance.

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V

VECTOR (FAA) - A heading issued to an aircraft to provide navigational guidance by radar. (See ICAO term RADAR VECTORING.)

VERTICAL SEPARATION - Separation between aircraft expressed in units of vertical distance.

VERY HIGH FREQUENCY- The frequency band between 30 and 300 MHz. Portions of this band, 108 to 118 MHz, are used for certain NAVAIDs; 118 to 136 MHz are used for civil air/ground voice communications. Other frequencies in this band are used for purposes not related to air traffic control.

VERY LOW FREQUENCY- The frequency band between 3 and 30 kHz.

VFR CONDITIONS (FAA) **-** Weather conditions equal to or better than the minimum for flight under visual flight rules. The term may be used as an ATC clearance/instruction only when:

a. An IFR aircraft requests a climb/descent in VFR conditions.
b. The clearance will result in noise abatement benefits where part of the IFR departure route does not conform to an FAA approved noise abatement route or altitude.
c. A pilot has requested a practice instrument approach and is not on an IFR flight plan.

Note— All pilots receiving this authorization must comply with the VFR visibility and distance from cloud criteria in 14 CFR Part 91. Use of the term does not relieve controllers of their responsibility to separate aircraft in Class B and Class C airspace or TRSAs as required by FAAO 7110.65. When used as an ATC clearance/instruction, the term may be abbreviated "VFR;" e.g., "MAINTAIN VFR," "CLIMB/DESCEND VFR," etc.

VIDEO MAP - An electronically displayed map on the radar display that may depict data such as aerodromes, heliports, runway centreline extensions, hospital emergency landing areas, NAVAIDs and fixes, reporting points, airway/route centrelines, boundaries, handoff points, special use tracks, obstructions, prominent geographic features, map alignment indicators, range accuracy marks, minimum vectoring altitudes.

VISUAL HOLDING - The holding of aircraft at selected, prominent geographical locations which can be easily recognized from the air.

VISUAL SEPARATION- A means employed by ATC to separate aircraft in terminal areas. There are two ways to effect this separation:

a. The tower controller sees the aircraft involved and issues instructions, as necessary, to ensure that the aircraft avoid each other.
b. A pilot sees the other aircraft involved and upon instructions from the controller provides his/her own separation by maneuvering his/her aircraft as necessary to avoid it. This may involve following another aircraft or keeping it in sight until it is no longer a factor.

VOICE COMMUNICATIONS AND SWITCHING SYSTEM - The VCSS is a computer controlled switching system that provides air traffic controllers with all voice circuits (air to ground and ground to ground) necessary for air traffic control.

VOR - A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the Taipei FIR. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature. Voice features may be used for transmitting information to pilots.

VORTAC - A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance measuring equipment (DME) at one site.

VORTICES - Circular patterns of air created by the movement of an airfoil through the air when generating lift.

As an airfoil moves through the atmosphere in sustained flight, an area of area of low pressure is created above it. The air flowing from the high pressure area to the low pressure area around and about the tips of the airfoil tends to roll up into two rapidly rotating vortices, cylindrical in shape. These vortices are the most predominant parts of aircraft wake turbulence and their rotational force is dependent upon the wing loading, gross weight, and speed of the generating aircraft. The vortices from medium to heavy aircraft can be of extremely high velocity and hazardous to smaller aircraft.

W

WAKE TURBULENCE - Phenomena resulting from the passage of an aircraft through the atmosphere. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air.

WHEN ABLE **-** When used in conjunction with ATC instructions, gives the pilot the latitude to delay compliance until a condition or event has been reconciled. Unlike "when ready," when instructions are prefaced "when able," the pilot is expected to seek the first opportunity to comply. Once a maneuver has been initiated, the pilot is expected to continue until the specifications of the instructions have been met. "When able," should not be used when expeditious compliance is required.

WILCO**-** *(Abbreviation for "will comply".)* "I understand your message and will comply with it."

WIND SHEAR- A change in wind speed and/or wind direction in a short distance resulting in a tearing or shearing effect. It can exist in a horizontal or vertical direction and occasionally in both.

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