

**CHANGE**

**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**

**Air Traffic Organization Policy**

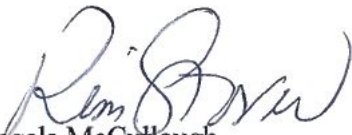
**JO 7110.65Y  
CHG 1**

**Effective Date:**  
January 30, 2020

**SUBJ:** Air Traffic Control

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- 1. Purpose of This Change.** This change transmits revised pages to Federal Aviation Administration Order JO 7110.65Y, Air Traffic Control, and the Briefing Guide.
- 2. Audience.** This change applies to all Air Traffic Organization (ATO) personnel and anyone using ATO directives.
- 3. Where Can I Find This Change?** This change is available on the FAA Web site at [http://faa.gov/air\\_traffic/publications](http://faa.gov/air_traffic/publications) and [https://employees.faa.gov/tools\\_resources/orders\\_notices/](https://employees.faa.gov/tools_resources/orders_notices/).
- 4. Explanation of Policy Change.** See the Explanation of Changes attachment which has editorial corrections and changes submitted through normal procedures. The Briefing Guide lists only new or modified material, along with background.
- 5. Distribution.** This change is distributed to selected offices in Washington headquarters, regional offices, service area offices, the William J. Hughes Technical Center, and the Mike Monroney Aeronautical Center. Also, copies are sent to all air traffic field facilities and international aviation field offices; and to interested aviation public.
- 6. Disposition of Transmittal.** Retain this transmittal until superseded by a new basic order.
- 7. Page Control Chart.** See the page control chart attachment.

  
Angela McCullough  
Vice President, Mission Support Services  
Air Traffic Organization

Date: 12/3/2019



## Explanation of Changes

### Change 1

**Direct questions through appropriate facility/service center office staff  
to the Office of Primary Interest (OPI)**

**a. 1-2-6. ABBREVIATIONS**

**2-8-1. FURNISH RVR/RVV VALUES**

**2-8-2. ARRIVAL/DEPARTURE**

**RUNWAY VISIBILITY**

**2-8-3. TERMINOLOGY**

**3-4-11. HIGH INTENSITY RUNWAY,  
RUNWAY CENTERLINE, AND  
TOUCHDOWN ZONE LIGHTS**

This change removes all references to Runway Visual Value (RVV) from this order.

**b. 2-3-8. AIRCRAFT EQUIPMENT  
SUFFIX**

**2-3-9. CLEARANCE STATUS**

This change updates paragraph 2-3-8 to reflect current ATC procedures for properly amending an aircraft's equipment suffix. In addition, Table 2-3-10, Aircraft Equipment Suffixes, is amended to correctly define the /O and /H equipment suffixes.

**c. 2-4-9. ABBREVIATED TRANSMIS-  
SIONS**

**2-4-15. EMPHASIS FOR CLARITY**

**2-4-20. AIRCRAFT IDENTIFICATION**

This change to paragraph 2-4-9 clarifies the aircraft identifications that may be abbreviated and provides improved descriptions of the aircraft identifications that are not to be abbreviated. This change to paragraph 2-4-15 consolidates procedures for similar sounding call signs into a single paragraph. A procedural NOTE pertaining to similar sounding call signs is relocated (and reworded) from paragraph 2-4-20 and added as a sub-paragraph to 2-4-15. This change to paragraph 2-4-20a1 deletes the NOTE and associated EXAMPLE and relocates both to paragraph 2-4-15. Several NOTES in 2-4-20 are modified or added to provide reference for similar sounding call signs. Paragraph 2-4-20b is updated to reflect that foreign civil aircraft registration identifications are to be stated in full. The term "air carrier" is replaced by "ICAO 3LD" and "U.S special and local call

signs" are specified as "other FAA authorized call signs". Editorial changes and reference changes have been made to provide clarity, emphasis and improved understanding of these three paragraphs.

**d. 2-6-4. ISSUING WEATHER AND  
CHAFF AREAS**

This change adds language to clarify that when an aircraft is vectored or deviates off of a procedure, all published speeds are canceled. Controllers must issue a speed if one is needed.

**e. 2-6-6. HAZARDOUS INFLIGHT  
WEATHER ADVISORY SERVICE (HIWAS)**

**2-9-3. CONTENT**

This change deletes commissioned HIWAS areas as this broadcast service is no longer provided by Flight Service. This change cancels and incorporates Notice JO 7110.768, Hazardous Inflight Weather Advisory Service (HIWAS), which was effective January 8, 2020.

**f. 3-10-5. LANDING CLEARANCE**

This change adds guidance to FAA Order JO 7110.65, Air Traffic Control, for controllers when they become aware an aircraft is about to land and has aligned to the wrong surface. When controllers become aware that an aircraft has aligned to the wrong surface, the controller must inform the pilot and issue control instructions/clearances. If time permits, the controller will notify the pilot of the misalignment and have the pilot verify the landing runway. This change cancels and incorporates Notice JO 7110.766, Landing Clearance (Wrong Surface Landings), which was effective September 23, 2019.

**g. 5-1-3. ATC SURVEILLANCE SOURCE  
USE**

**5-2-1. ASSIGNMENT CRITERIA**

**5-2-13. STANDBY OR LOW**

**SENSITIVITY OPERATION**

**5-2-17. FAILED TRANSPONDER IN  
CLASS A AIRSPACE**

**5-2-23. BEACON TERMINATION**

## **5-3-2. PRIMARY RADAR IDENTIFICATION METHODS**

### **5-3-3. BEACON IDENTIFICATION METHODS**

This change updates multiple paragraphs to align them with ADS-B Out technology and current regulatory requirements, deletes obsolete references to aircraft transponder “low sensitivity position” operation and “blooming” target displays, and makes other minor editorial changes. This change cancels and incorporates Notice JO 7110.770, Automatic Dependent Surveillance–Broadcast (ADS-B) Related Changes, which was effective January 2, 2020.

#### **h. 5-2-25. INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER**

##### **5-2-26. ADS-B ALERTS**

#### **5-2-27. ADS-B OUT OFF OPERATIONS**

This change adds language to paragraphs 5-2-25 and 5-2-26 that reflects the recent amendments to 14 CFR Section 91.225(f), which gives air traffic controllers the authority to direct an aircraft to stop transmitting ADS-B when transmitting would jeopardize the safe execution of air traffic control functions. This change updates paragraph 5-2-26 subparagraph b, deleting the reporting requirements related to a Duplicate ICAO Address. This change also adds a new paragraph that provides guidance concerning FAA–authorized ADS-B Out OFF operations. Lastly, this change harmonizes terminology in this paragraph with that used by ICAO as well as in the Aeronautical Information Manual (AIM) and the Aeronautical Information Publication (AIP), and makes editorial changes for consistency within FAA Order JO 7110.65. This change cancels and incorporates Notice JO 7110.770, Automatic Dependent Surveillance–Broadcast (ADS-B) Related Changes, which was effective January 2, 2020.

#### **i. 5-5-4. MINIMA**

This editorial change accounts for the use of FUSION targets when authorizing 2.5 nautical mile reduced separation on final within 10 NM of the landing runway in accordance with paragraph 5-5-4 j.

## **j. 5-6-2. METHODS**

This change adds language to clarify that when an aircraft is vectored or deviates off of a procedure, all published speeds are canceled. Controllers must issue a speed if one is needed.

### **k. 5-7-1. APPLICATION**

This change clarifies that when an aircraft is vectored or deviates off of a procedure that contains published speeds, those speeds are canceled. A NOTE is added that advises controllers that the last speed on a STAR will be maintained until ATC changes it. A second note is added identifying the importance of advising pilots where they can expect to resume the published speed.

### **l. 5-8-3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES**

This change adds the term immediately after departure to the conditions for the use of ELSO to remove any ambiguity and also aligns the meaning of “Immediately after departure” to account for the minimum required divergence permitted under ELSO. This change also re-formats the paragraph to flow better, and to help the reader to better distinguish the conditions required to meet the ELSO standard.

### **m. 5-9-9. SIMULTANEOUS OFFSET INSTRUMENT APPROACHES (SOIA)– HIGH UPDATE RADAR**

This change removes the requirement for high update rate surveillance when conducting SOIA operations. It also corrects the tower applied Visual Separation provision which is noted in error.

#### **n. 8-7-3. LONGITUDINAL SEPARATION**

##### **8-7-4. LATERAL SEPARATION**

##### **8-8-3. LONGITUDINAL SEPARATION**

##### **8-8-4. LATERAL SEPARATION**

##### **8-9-3. LONGITUDINAL SEPARATION**

##### **8-9-4. LATERAL SEPARATION**

#### **8-10-3. LONGITUDINAL SEPARATION**

##### **8-10-4. LATERAL SEPARATION**

This change adds the compulsory Required Communication Performance (RCP) and Required Surveillance Performance (RSP) values to the Chapter 8 performance–based longitudinal and lateral separation paragraphs and tables.

**o. 9-3-2. SEPARATION MINIMA**

This change stipulates the separation standards and procedures to be used while aircraft are operating in proximity to aircraft hazard areas (AHA) and transitional hazard areas (THA) that may be designated as temporary flight restrictions or stationary altitude reservations. This change cancels and incorporates Notice JO 7110.767, Separation Minima During Commercial Launch and Reentry Operations, which was effective October 15, 2019.

**p. Editorial Changes**

Editorial changes include making P/CG a consistent abbreviation, clarifying the appropriate approval authority directorate in paragraph 5-14-5b NOTE, and updating incorrect references throughout.

**q. Entire publication**

Additional editorial/format changes were made where necessary. Revision bars were not used because of the insignificant nature of these changes.



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# Chapter 1. General

## Section 1. Introduction

### 1-1-1. PURPOSE OF THIS ORDER

This order prescribes air traffic control procedures and phraseology for use by persons providing air traffic control services. Controllers are required to be familiar with the provisions of this order 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. AUDIENCE

This order applies to all ATO personnel and anyone using ATO directives.

### 1-1-3. WHERE TO FIND THIS ORDER

This order is available on the FAA Web site at [http://www.faa.gov/regulations\\_policies/orders\\_notices](http://www.faa.gov/regulations_policies/orders_notices).

### 1-1-4. WHAT THIS ORDER CANCELS

FAA Order JO 7110.65X, Air Traffic Control, dated October 12, 2017, and all changes to it are canceled.

### 1-1-5. EXPLANATION OF CHANGES

The significant changes to this order are identified in the Explanation of Changes page(s). It is advisable to retain the page(s) throughout the duration of the basic order.

### 1-1-6. EFFECTIVE DATES AND SUBMISSIONS FOR CHANGES

**a.** This order and its changes are scheduled to be published to coincide with AIRAC dates. (See TBL 1-1-1.)

**b.** The “Cutoff Date for Completion” in the table below refers to the deadline for a proposed change to be fully coordinated and signed. Change initiators must submit their proposed changes well in advance of this cutoff date to meet the publication effective date. The process to review and coordinate changes often takes several months after the change is initially submitted.

*TBL 1-1-1*  
**Publication Schedule**

Basic or Change	Cutoff Date for Completion	Effective Date of Publication
JO 7110.65Y	2/28/19	8/15/19
Change 1	8/15/19	1/30/20
Change 2	1/30/20	7/16/20
Change 3	7/16/20	12/31/20
JO 7110.65Z	12/31/20	6/17/21

### 1-1-7. DELIVERY DATES

**a.** If an FAA facility **has not** received the order/changes at least 30 days before the above effective dates, the facility must notify its service area office distribution officer.

**b.** If a military facility **has not** received the order/changes at least 30 days before the above effective dates, the facility must notify its appropriate military headquarters. (See TBL 1-1-2.)

*TBL 1-1-2*  
**Military Distribution Contacts**

Military Headquarters	DSN	Commercial
U.S. Army USAASA	656-4868	(703) 806-4868
U.S. Air Force HQ AFFSA	884-5509	(405) 734-5509
U.S. Navy CNO (N980A)	224-2638	(703) 614-2638

### 1-1-8. RECOMMENDATIONS FOR PROCEDURAL CHANGES

The office of primary responsibility (OPR) for this order is:

FAA Headquarters, Mission Support Services  
Policy (AJV-P)  
600 Independence Avenue, SW  
Washington, DC 20597

**a.** Personnel should submit recommended changes in procedures to facility management.

**b.** Recommendations from other sources should be submitted through appropriate FAA, military, or industry/user channels.

**c.** Proposed changes must be submitted electronically to 9-AJV-8-HQ-Correspondence@faa.gov. The submission should include a description of the recommended change, and the proposed language to be used in the order.

**NOTE–**

*For details on the submission process as well as additional AJV-P processing responsibilities, please see FAA Order JO 7000.5, Procedures for Submitting Changes to Air Traffic Control Publications.*

**d.** Procedural changes will not be made to this order until the operational system software has been adapted to accomplish the revised procedures

### **1-1-9. REQUESTS FOR INTERPRETATIONS OR CLARIFICATIONS TO THIS ORDER**

**a.** Interpretation requests from field air traffic personnel must be submitted as follows:

**1.** The request must be submitted, in writing, by an Air Traffic Facility/General manager to their Service Area Director.

**2.** The Service Area Director must review the request and determine if more than one interpretation on the intent of the language can be inferred.

**3.** If it is determined that an interpretation is required, the Service Area Director must submit the request, in writing, to the Policy Directorate, for a response.

**b.** If a request does not require an interpretation but further clarification is needed it must be forwarded to the Service Center Operations Support Group for a response.

**1.** The Service Center Operations Support Group may consult with the Policy Directorate when preparing their response.

**2.** The Service Center Operations Support Group must provide a written response to the requestor and forward the response to the Policy Directorate.

**c.** Interpretation requests from all other sources must be submitted to the Policy Directorate at 9-AJV-8-HQ-Correspondence@faa.gov.

**NOTE–**

*Interpretations can be accessed through the Air Traffic Control Interpretation link at the following website: [https://my.faa.gov/org/linebusiness/ato/mission\\_support/air\\_traffic\\_procedures.html](https://my.faa.gov/org/linebusiness/ato/mission_support/air_traffic_procedures.html).*

### **1-1-10. PROCEDURAL LETTERS OF AGREEMENT (LOA)**

Procedures/minima which are applied jointly or otherwise require the cooperation or concurrence of more than one facility/organization must be documented in a letter of agreement. LOAs only supplement this order. 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–**

*FAA Order JO 7110.65, Para 2-1-1, ATC Service.*

*FAA Order JO 7210.3, Para 4-3-1, Letters of Agreement.*

### **1-1-11. CONSTRAINTS GOVERNING SUPPLEMENTS AND PROCEDURAL DEVIATIONS**

**a.** Exceptional or unusual requirements may dictate procedural deviations or supplementary procedures to this order. Prior to implementing supplemental or any procedural deviation that alters the level, quality, or degree of service, obtain prior approval from the Vice President, Mission Support Services.

**b.** If military operations or facilities are involved, prior approval by the following appropriate headquarters is required for subsequent interface with FAA. (See TBL 1-1-3.)

## 1-2-4. REFERENCES

As used in this order, references direct attention to an additional or supporting source of information such as FAA, NWS, and other agencies' orders, directives, notices, CFRs, and Advisory Circulars (ACs).

## 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 order. 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*, *OCEANIC*, or *TERMINAL* are only to be applied by the designated type facility. When they are not so designated, the paragraphs/sections apply to all types of facilities (en route, oceanic, and terminal).

e. The annotation, *USAF* for the U.S. Air Force, *USN* for the U.S. Navy, and *USA* for the U.S. Army denotes that the procedure immediately following the annotation applies only to the designated service.

### REFERENCE-

FAA Order JO 7110.65, Para 2-1-12, Military Procedures.

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 must be exercised when using nonstandard 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 used in the example.*

## 1-2-6. ABBREVIATIONS

As used in this order, the abbreviations listed below have the following meanings indicated. (See TBL 1-2-1.)

**TBL 1-2-1**  
**FAA Order JO 7110.65 Abbreviations**

Abbreviation	Meaning
AAR . . . . .	Airport acceptance rate
AC . . . . .	Advisory Circular
ACC . . . . .	Area Control Center
ACD . . . . .	ARTS Color Display
ACE-IDS . . .	ASOS Controller Equipment- Information Display System
ACL . . . . .	Aircraft list
ACLS . . . . .	Automatic Carrier Landing System
ADC . . . . .	Aerospace Defense Command
ADIZ . . . . .	Air Defense Identification Zone (to be pronounced "AY DIZ")
ADS . . . . .	Automatic Dependent Surveillance
ADS-B . . . . .	Automatic Dependent Surveillance Broadcast
ADS-C . . . . .	Automatic Dependent Surveillance Contract
AERT . . . . .	Automation Embedded Route Text
AFP . . . . .	Airspace Flow Program
AIDC . . . . .	ATS Interfacility Data Communications
AIM . . . . .	Aeronautical Information Manual
AIRMET . . .	Airmen's meteorological information
ALDARS . . .	Automated Lightning Detection and Reporting System
ALERFA . . .	Alert phase code (Alerting Service)
ALNOT . . . .	Alert notice
ALS . . . . .	Approach Light System

Abbreviation	Meaning
ALTRV . . . . .	Altitude reservation
AMASS . . . . .	Airport Movement Area Safety System
AMB . . . . .	Ambiguity—A disparity greater than 2 miles exists between the position declared for a target by ATIS and another facility's computer declared position during interfacility handoff
AMVER . . . . .	Automated Mutual Assistance Vessel Rescue System
ANG . . . . .	Air National Guard
APR . . . . .	ATC preferred route
APREQ . . . . .	Approval Request
ARAC . . . . .	Army Radar Approach Control facility (US Army)
ARINC . . . . .	Aeronautical Radio Incorporated
ARIP . . . . .	Air refueling initial point
ARSR . . . . .	Air route surveillance radar
ARTCC . . . . .	Air Route Traffic Control Center
ARTS . . . . .	Automated Radar Terminal System
ASD . . . . .	Aircraft Situation Display
ASDE . . . . .	Airport surface detection equipment
ASDE-X . . . . .	Airport Surface Detection Equipment System – Model X
ASF . . . . .	Airport Stream Filters
ASOS . . . . .	Automated Surface Observing System
ASR . . . . .	Airport surveillance radar
ASSC . . . . .	Airport Surface Surveillance Capability
ATC . . . . .	Air traffic control
ATCAA . . . . .	ATC assigned airspace
ATCSCC . . . . .	David J. Hurley Air Traffic Control System Command Center
ATD . . . . .	Along-Track Distance
ATIS . . . . .	Automatic Terminal Information Service
ATO . . . . .	Air Traffic Organization
ATO COO . . . . .	Air Traffic Organization Chief Operating Officer
ATOP . . . . .	Advanced Technologies and Oceanic Procedures
ATS . . . . .	Air Traffic Service
AWOS . . . . .	Automated Weather Observing System
BAASS . . . . .	Bigelow Aerospace Advanced Space Studies
BASE . . . . .	Cloud base
CA . . . . .	Conflict Alert
CARCAH . . . . .	Chief, Aerial Reconnaissance Coordination, All Hurricanes

Abbreviation	Meaning
CARF . . . . .	Central Altitude Reservation Function
CAT . . . . .	Clear air turbulence
CDT . . . . .	Controlled departure time
CENRAP . . . . .	Center Radar ARTS Presentation
CEP . . . . .	Central East Pacific
CERAP . . . . .	Combined Center/RAPCON
CFR . . . . .	Code of Federal Regulations
CFR . . . . .	Call for Release
CIC . . . . .	Controller-in-Charge
CNS . . . . .	Continuous
CPDLC . . . . .	Controller Pilot Data Link Communications
CPME . . . . .	Calibration Performance Monitor Equipment
CTA . . . . .	Control Area
CTRD . . . . .	Certified Tower Radar Display
CVFP . . . . .	Chartered Visual Flight Procedure
CWA . . . . .	Center Weather Advisory
DETRESFA . . . . .	Distress Phase code (Alerting Service)
DH . . . . .	Decision height
DL . . . . .	Departure List
DME . . . . .	Distance measuring equipment compatible with TACAN
DOE . . . . .	Department of Energy
DP . . . . .	Instrument Departure Procedure
DR . . . . .	Dead reckoning
DRT . . . . .	Diversion recovery tool
DSR . . . . .	Display System Replacement
DTAS . . . . .	Digital Terminal Automation Systems
DTM . . . . .	Digital Terrain Map
DVFR . . . . .	Defense Visual Flight Rules
DVRSN . . . . .	Diversion
EA . . . . .	Electronic Attack
EAS . . . . .	En Route Automation System
EBUS . . . . .	Enhanced Backup Surveillance System
EDCT . . . . .	Expect Departure Clearance Time
EDST . . . . .	En Route Decision Support Tool
EFC . . . . .	Expect further clearance
EFVS . . . . .	Enhanced Flight Vision System
ELDB . . . . .	Enhanced Limited Data Block
ELP . . . . .	Emergency Landing Pattern
ELT . . . . .	Emergency locator transmitter
EoR . . . . .	Established on RNP

Abbreviation	Meaning
EOVM . . . . .	Emergency obstruction video map
EOS . . . . .	End Service
ERAM . . . . .	En Route Automation Modernization
ERIDS . . . . .	En Route Information Display System
ETA . . . . .	Estimated time of arrival
FAA . . . . .	Federal Aviation Administration
FANS . . . . .	Future Air Navigation System
FDB . . . . .	Full Data Block
FDIO . . . . .	Flight Data Input/Output
FDP . . . . .	Flight data processing
FICON . . . . .	Field Condition
FIR . . . . .	Flight Information Region
FL . . . . .	Flight level
FLIP . . . . .	Flight Information Publication
FLY . . . . .	Fly or flying
FMS . . . . .	Flight Management System
FSM . . . . .	Flight Schedule Monitor
FSS . . . . .	Flight Service Station
GCA . . . . .	Ground controlled approach
GNSS . . . . .	Global Navigation Satellite System
GPD . . . . .	Graphics Plan Display
GPS . . . . .	Global Positioning System
GS . . . . .	Ground stop
HAR . . . . .	High Altitude Redesign
HF/RO . . . . .	High Frequency/Radio Operator
HIRL . . . . .	High intensity runway lights
IAFDOF . . . . .	Inappropriate Altitude for Direction of Flight
ICAO . . . . .	International Civil Aviation Organization
IDENT . . . . .	Aircraft identification
IDS . . . . .	Information Display System
IFR . . . . .	Instrument flight rules
IFSS . . . . .	International Flight Service Station
ILS . . . . .	Instrument Landing System
INCERFA . . . . .	Uncertainty Phase code (Alerting Service)
INREQ . . . . .	Information request
INS . . . . .	Inertial Navigation System
IR . . . . .	IFR military training route
IRU . . . . .	Inertial Reference Unit
ISR . . . . .	Increased Separation Required
ITWS . . . . .	Integrated Terminal Weather System
JATO . . . . .	Jet assisted takeoff
LAHSO . . . . .	Land and Hold Short Operations
LOA . . . . .	Letter of Agreement

Abbreviation	Meaning
LLWAS . . . . .	Low Level Wind Shear Alert System
LLWAS NE . . . . .	Low Level Wind Shear Alert System Network Expansion
LLWAS-RS . . . . .	Low Level Wind Shear Alert System Relocation/Sustainment
L/MF . . . . .	Low/medium frequency
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
MARSA . . . . .	Military authority assumes responsibility for separation of aircraft
MCA . . . . .	Minimum crossing altitude
MCI . . . . .	Mode C Intruder
MDA . . . . .	Minimum descent altitude
MDM . . . . .	Main display monitor
MEA . . . . .	Minimum en route (IFR) altitude
MEARTS . . . . .	Micro En Route Automated Radar Tracking System
METAR . . . . .	Aviation Routine Weather Report
MIA . . . . .	Minimum IFR altitude
MIAWS . . . . .	Medium Intensity Airport Weather System
MIRL . . . . .	Medium intensity runway lights
MNPS . . . . .	Minimum Navigation Performance Specification
MNT . . . . .	Mach Number Technique
MOA . . . . .	Military operations area
MOCA . . . . .	Minimum obstruction clearance altitude
MRA . . . . .	Minimum reception altitude
MSAW . . . . .	Minimum Safe Altitude Warning
MSL . . . . .	Mean sea level
MTI . . . . .	Moving target indicator
MTR . . . . .	Military training route
MVA . . . . .	Minimum vectoring altitude
NADIN . . . . .	National Airspace Data Interchange Network
NAR . . . . .	National Automation Request
NAS . . . . .	National Airspace System
NAT . . . . .	ICAO North Atlantic Region
NAT HLA . . . . .	North Atlantic High Level Airspace
NBCAP . . . . .	National Beacon Code Allocation Plan
NDB . . . . .	Nondirectional radio beacon
NHOP . . . . .	National Hurricane Operations Plan

Abbreviation	Meaning
NM . . . . .	Nautical mile
NOAA . . . . .	National Oceanic and Atmospheric Administration
NOPAC . . . . .	North Pacific
NORAD . . . . .	North American Aerospace Defense Command
NOS . . . . .	National Ocean Service
NOTAM . . . . .	Notice to Airmen
NOWGT . . . . .	No weight. The weight class or wake category has not been determined
NRP . . . . .	North American Route Program
NRR . . . . .	Nonrestrictive Route
NRS . . . . .	Navigation Reference System
NTZ . . . . .	No transgression zone
NWS . . . . .	National Weather Service
NWSOP . . . . .	National Winter Storm Operations Plan
ODALS . . . . .	Omnidirectional Approach Lighting System
ODP . . . . .	Obstacle Departure Procedure
OID . . . . .	Operator Interface Device
OS . . . . .	Operations Supervisor
OTR . . . . .	Oceanic transition route
PAPI . . . . .	Precision Approach Path Indicators
PAR . . . . .	Precision approach radar
PAR . . . . .	Preferred arrival route
PBCT . . . . .	Proposed boundary crossing time
P/CG . . . . .	Pilot/Controller Glossary
PDAR . . . . .	Preferential departure arrival route
PDC . . . . .	Pre-Departure Clearance
PDR . . . . .	Preferential departure route
PPI . . . . .	Plan position indicator
PTP . . . . .	Point-to-point
PVD . . . . .	Plan view display
RA . . . . .	Radar Associate
RAIL . . . . .	Runway alignment indicator lights
RAPCON . . . . .	Radar Approach Control facility (USAF, USN and USMC)
RATCF . . . . .	Radar Air Traffic Control Facility (USN and USMC)
RBS . . . . .	Radar bomb scoring
RCC . . . . .	Rescue Coordination Center
RCLS . . . . .	Runway Centerline System
RCR . . . . .	Runway condition reading

Abbreviation	Meaning
RE . . . . .	Recent (used to qualify weather phenomena such as rain, e.g. recent rain = RERA)
REIL . . . . .	Runway end identifier lights
RF . . . . .	Radius-to-Fix
RNAV . . . . .	Area navigation
RNP . . . . .	Required Navigation Performance
RTQC . . . . .	Real-Time Quality Control
RVR . . . . .	Runway visual range
RVSM . . . . .	Reduced Vertical Separation Minimum
RwyCC . . . . .	Runway Condition Codes
RwyCR . . . . .	Runway Condition Report
SAA . . . . .	Special Activity Airspace
SAR . . . . .	Search and rescue
SATCOM . . . . .	Satellite Communication
SDP . . . . .	Surveillance Data Processing
SELCAL . . . . .	Selective Calling System
SFA . . . . .	Single frequency approach
SFO . . . . .	Simulated flameout
SID . . . . .	Standard Instrument Departure
SIGMET . . . . .	Significant meteorological information
SPA . . . . .	Special Posting Area
SPECI . . . . .	Nonroutine (Special) Aviation Weather Report
STAR . . . . .	Standard terminal arrival
STARS . . . . .	Standard Terminal Automation Replacement System
STMC . . . . .	Supervisory Traffic Management Coordinator
STMCIC . . . . .	Supervisory Traffic Management Coordinator-in-charge
STOL . . . . .	Short takeoff and landing
SURPIC . . . . .	Surface Picture
SVFR . . . . .	Special Visual Flight Rules
TAA . . . . .	Terminal arrival area
TAS . . . . .	Terminal Automation Systems
TACAN . . . . .	TACAN UHF navigational aid (omnidirectional course and distance information)
TAWS . . . . .	Terrain Awareness Warning System
TCAS . . . . .	Traffic Alert and Collision Avoidance System
TCDD . . . . .	Tower cab digital display
TDLS . . . . .	Terminal Data Link System

<b>Abbreviation</b>	<b>Meaning</b>
TDW . . . . .	Tower display workstation
TDWR . . . . .	Terminal Doppler Weather Radar
TDZL . . . . .	Touchdown Zone Light System
TF . . . . .	Track-to-Fix
TFMS . . . . .	Traffic Flow Management System
TMC . . . . .	Traffic Management Coordinator
TMU . . . . .	Traffic Management Unit
TRACON . . .	Terminal Radar Approach Control
TRSA . . . . .	Terminal radar service area
UFO . . . . .	Unidentified flying object
UHF . . . . .	Ultra high frequency
USA . . . . .	United States Army
USAF . . . . .	United States Air Force
USN . . . . .	United States Navy
UTC . . . . .	Coordinated universal time
UTM . . . . .	Unsuccessful transmission message
UUA . . . . .	Urgent pilot weather report
VCI . . . . .	Voice Communication Indicator
VFR . . . . .	Visual flight rules
VHF . . . . .	Very high frequency
VMC . . . . .	Visual meteorological conditions
VNAV . . . . .	Vertical Navigation
VOR . . . . .	VHF navigational aid (omnidirectional course information)
VOR/DME . .	Collocated VOR and DME navigational aids (VHF course and UHF distance information)
VORTAC . . .	Collocated VOR and TACAN navigation aids (VHF and UHF course and UHF distance information)
VR . . . . .	VFR military training route
VSCS . . . . .	Voice Switching and Control System
WAAS . . . . .	Wide Area Augmentation System
WARP . . . . .	Weather and Radar Processing
WATRS . . . .	West Atlantic Route System
WRA . . . . .	Weather Reconnaissance Area
WSO . . . . .	Weather Service Office
WSP . . . . .	Weather System Processor
WST . . . . .	Convective SIGMET



d. Air traffic managers at automated terminal radar facilities may waive the requirement to use flight progress strips provided:

1. Backup systems such as multiple radar sites/systems or single site radars with CENRAP are utilized.

2. Local procedures are documented in a facility directive. These procedures should include but not be limited to:

- (a) Departure areas and/or procedures.
- (b) Arrival procedures.
- (c) Overflight handling procedures.
- (d) Transition from radar to nonradar.
- (e) Transition from ARTS to non-ARTS.
- (f) Transition from ASR to CENRAP.
- (g) Transition to or from ESL.

3. No misunderstanding will occur as a result of no strip usage.

4. Unused flight progress strips, facility developed forms and/or blank notepads shall be provided for controller use.

5. Facilities shall revert to flight progress strip usage if backup systems referred to in subpara d1 are not available.

e. Air traffic managers at FDIO locations may authorize reduced lateral spacing between fields so as to print all FDIO data to the left of the strip perforation. When using FAA Form 7230-7.2, all items will retain the same relationship to each other as they do when the full length strip (FAA Form 7230-7.1) is used.

## 2-3-5. AIRCRAFT IDENTITY

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

a. Civil aircraft, including the air-carrier letter-digit registration number which can include the letter "T" for air taxi, the letter "L" for MEDEVAC, or the 3-letter company designator specified in FAA Order JO 7340.2, Contractions, followed by the trip or flight number. Use the operating air carrier's company name in identifying equipment interchange flights.

### EXAMPLE-

"N12345."  
 "TN5552Q."  
 "AA1192."  
 "LN751B."

### NOTE-

The letter "L" is not to be used for air carrier/air taxi MEDEVAC aircraft.

### b. Military Aircraft.

1. Prefixes indicating branch of service and/or type of mission followed by the last 5 digits of the serial number (the last 4 digits for CFC and CTG). (See TBL 2-3-6 and TBL 2-3-7.)

2. Pronounceable words of 3, 4, 5, and 6 letters followed by a 4-, 3-, 2-, or 1-digit number.

### EXAMPLE-

"SAMP Three One Six."

3. Assigned double-letter 2-digit flight number.

4. Navy or Marine fleet and training command aircraft, one of the following:

(a) The service prefix and 2 letters (use phonetic alphabet equivalent) followed by 2 or 3 digits.

TBL 2-3-6

### Branch of Service Prefix

Prefix	Branch
A	U.S. Air Force
C	U.S. Coast Guard
G	Air or Army National Guard
R	U.S. Army
VM	U.S. Marine Corps
VV	U.S. Navy
CFC	Canadian Forces
CTG	Canadian Coast Guard

TBL 2-3-7

### Military Mission Prefix

Prefix	Mission
E	Medical Air Evacuation
F	Flight Check
L	LOGAIR (USAF Contract)
RCH	AMC (Air Mobility Command)
S	Special Air Mission

(b) The service prefix and a digit and a letter (use phonetic alphabet equivalent) followed by 2 or 3 digits.

5. Aircraft carrying the President, Vice President, and/or their family members will use the identifiers in the following tables. See TBL 2–3–8 and TBL 2–3–9.

**TBL 2–3–8  
President and Family**

Service	President	Family
Air Force	AF1	EXEC1F
Marine	VM1	EXEC1F
Navy	VV1	EXEC1F
Army	RR1	EXEC1F
Coast Guard	C1	EXEC1F
Guard	G1	EXEC1F
Commercial	EXEC1	EXEC1F

**TBL 2–3–9  
Vice President and Family**

Service	Vice President	Family
Air Force	AF2	EXEC2F
Marine	VM2	EXEC2F
Navy	VV2	EXEC2F
Army	RR2	EXEC2F
Coast Guard	C2	EXEC2F
Guard	G2	EXEC2F
Commercial	EXEC2	EXEC2F

c. Special-use. Approved special-use identifiers.

## 2–3–6. AIRCRAFT TYPE

Use the approved aircraft type designator, in accordance with FAA Order 7360.1, Aircraft Type Designators.

## 2–3–7. USAF/USN UNDERGRADUATE PILOTS

To identify aircraft piloted by solo USAF/USN undergraduate student pilots (who may occasionally request revised clearances because they normally are restricted to flight in VFR conditions), the aircraft identification in the flight plan shall include the letter “Z” as a suffix. Do not use this suffix, however, in ground-to-air communication.

### NOTE–

*USAF solo students who have passed an instrument certification check may penetrate cloud layers in climb or descent only. Requests for revised clearances to avoid clouds in level flight can still be expected. This does not*

*change the requirement to use the letter “Z” as a suffix to the aircraft identification.*

### REFERENCE–

*FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.*

*FAA Order JO 7610.4, Chapter 12, Section 10, USAF Undergraduate Flying Training (UFT)/Pilot Instructor Training (PIT)/Introduction To Fighter Fundamentals.*

## 2–3–8. AIRCRAFT EQUIPMENT SUFFIX

a. The aircraft equipment suffix identifying communication, navigation and surveillance (CNS) capability is generated by automation using the equipment codes of the ICAO flight plan. To change a suffix, the CNS equipment codes must be modified, allowing automation to translate them into the proper suffix. If using unsupported automation platforms (OFDPS and FDP2000), verbally coordinate changes with adjacent supported facilities.

b. ERAM and ATOP are best suited for making changes to the equipment codes in an ICAO flight plan. For FDIO entries, if uncertain of the proper format to correctly amend an equipment code, verbally coordinate the change with the appropriate en route facility.

### NOTE–

*Directly changing the equipment suffix with a symbol preceded by a slant instead of amending the aircraft equipment codes may unintentionally alter or delete other equipment codes.*

c. For VFR operations, indicate the aircraft’s transponder and navigation capabilities by adding the appropriate symbol, preceded by a slant (See TBL 2–3–10).

d. GNSS-equipped aircraft:

1. Have an equipment suffix of /G, /L, /S, or /V.
2. May be determined by executing an ICAO flight plan readout and verifying a filed “G” in the ICAO equipment list.
3. May be determined by verifying with the pilot that the aircraft is GNSS-equipped.

e. When forwarding this information, state the aircraft type followed by the word “slant” and the appropriate phonetic letter equivalent of the suffix.

### EXAMPLE–

*“Cessna Three–ten slant Tango.”*

*“A–Ten slant November.”*

*“F–Sixteen slant Papa.”*

*“Seven–sixty–seven slant Golf.”*

### NOTE–

*/H and /O are intended for ATC use only. These suffixes are not published in the Aeronautical Information Manual.*

## 2-3-9. CLEARANCE STATUS

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.

*TBL 2-3-10*

**Aircraft Equipment Suffixes**

Separation Standard	Navigation Capability	Transponder Capability	Suffix
RVSM	Any	Failed transponder	/H
	Any	Failed Mode C	/O
	No RNAV, No GNSS	Transponder with Mode C	/W
	RNAV, No GNSS	Transponder with Mode C	/Z
	GNSS	Transponder with Mode C	/L
Non-RVSM	No DME	No transponder	/X
		Transponder, no Mode C	/T
		Transponder with Mode C	/U
	DME	No transponder	/D
		Transponder, no Mode C	/B
		Transponder with Mode C	/A
	TACAN	No transponder	/M
		Transponder, no Mode C	/N
		Transponder with Mode C	/P
	RNAV, No GNSS	No transponder	/Y
		Transponder, no Mode C	/C
		Transponder with Mode C	/I
	GNSS	No transponder	/V
		Transponder, no Mode C	/S
		Transponder with Mode C	/G

## 2-3-10. 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 facility 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 2-3-11 and TBL 2-3-12.)
- d. Control Information Symbols.  
(See FIG 2-3-7 and FIG 2-3-8.)

### REFERENCE-

FAA Order JO 7110.65, Para 4-5-3, Exceptions.

**TBL 2-3-11**  
**Clearance Abbreviations**

Abbreviation	Meaning
A	Cleared to airport (point of intended landing)
B	Center clearance delivered
C	ATC clears (when clearance relayed through non-ATC facility)
CAF	Cleared as filed
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
O	Cleared to the outer marker
PD	Cleared to climb/descend at pilot's discretion
Q	Cleared to fly specified sectors of a NAVAID defined in terms of courses, bearings, radials or quadrants within a designated radius.
T	Cleared through (for landing and takeoff through intermediate point)
V	Cleared over the fix
X	Cleared to cross (airway, route, radial) at (point)
Z	Tower jurisdiction

**TBL 2-3-12**  
**Miscellaneous Abbreviations**

Abbreviation	Meaning
BC	Back course approach
CT	Contact approach
FA	Final approach
FMS	Flight management system approach
GPS	GPS approach
I	Initial approach
ILS	ILS approach
MA	Missed approach
NDB	Nondirectional radio beacon approach
OTP	VFR conditions-on-top
PA	Precision approach
PT	Procedure turn
RA	Resolution advisory (Pilot reported TCAS event)
RH	Runway heading
RNAV	Area navigation approach
RP	Report immediately upon passing (fix/altitude)
RX	Report crossing
SA	Surveillance approach
SI	Straight-in approach
TA	TACAN approach
TL	Turn left
TR	Turn right
VA	Visual approach
VR	VOR approach

## 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.

**NOTE—**

*Although all FAA facilities, including RAPCONs and RATCFs, are required to monitor all assigned frequencies continuously, USAF facilities may not monitor all unpublished discrete frequencies.*

### 2-4-3. PILOT ACKNOWLEDGMENT/READ BACK

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.
- b. Ensure the read back of hold short instructions, whether a part of taxi instructions or a LAHSO clearance.
- c. Ensure pilots use call signs and/or registration numbers in any read back acknowledging an Air Traffic Clearance or ATC Instruction.

**NOTE—**

*1. ATC Clearance/Instruction Read Back guidance for pilots in the AIM states:*

*a. Although pilots should read back the “numbers,” unless otherwise required by procedure or controller request, pilots may acknowledge clearances, control instructions,*

*or other information by using “Wilco,” “Roger,” “Affirmative,” or other words or remarks with their aircraft identification.*

*b. Altitudes contained in charted procedures, such as departure procedures, instrument approaches, etc., need not be read back unless they are specifically stated by the controller.*

*c. Initial read back of a taxi, departure or landing clearance should include the runway assignment, including left, right, center, etc. if applicable.*

*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.*

**EXAMPLE—**

*“Climbing to Flight Level three three zero, United Twelve” or “November Five Charlie Tango, roger, cleared to land runway four left.”*

**REFERENCE—**

*P/CG Term – Air Traffic Clearance*

*P/CG Term – ATC Instructions*

*FAA Order JO 7110.65, 3-7-2. Taxi and Ground Movement Operations*

*FAA Order JO 7110.65, 10-4-4. Communications Failure*

*AIM Para 4-2-3, Contact Procedures*

*AIM Para 4-4-7 Pilot Responsibility upon Clearance Issuance*

*AIM Para 6-4-1, Two-way Radio Communications Failure*

*Federal Register, April 1, 1999 14 CFR Part 91 Pilot Responsibility for Compliance with ATC Clearances and Instructions*

### 2-4-4. AUTHORIZED INTERRUPTIONS

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

**NOTE—**

*Some users have adopted procedures to ensure uninterrupted receiving capability with ATC when a pilot with only one operative communications radio must interrupt his/her communications guard because of a safety related problem requiring airborne communications with his/her company. In this event, pilots will request approval to abandon guard on the assigned ATC frequency for a mutually agreeable time period. Additionally, they will inform 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.

**REFERENCE—**

*FAA Order JO 7210.3, Para 3-2-2, Authorized Messages Not Directly Associated with Air Traffic Services.*

## 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 must 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 Long Beach Airport. Exercise extreme caution on all frequencies and verify instructions.”*

- c. Collect pertinent information regarding the incident.
- d. Notify the operations 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 FAA messages as required.

### NOTE-

*The FAA Administrator and Deputy Administrator will sometimes use code phrases to identify themselves in air-to-ground communications as follows:*

*Administrator: “SAFEAIR ONE.”*

*Deputy Administrator: “SAFEAIR TWO.”*

### EXAMPLE-

*“Miami Center, Jetstar One, this is SAFEAIR ONE, (message).”*

- c. Relay operational information to military aircraft operating on, or planning to operate on IRs.

## 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 must 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-

*FAA Order JO 7110.65, Para 2-4-20, Aircraft Identification.*

## 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 with a U.S. civil aircraft using the aircraft registration as identification.

- b. Do not abbreviate:

1. Similar sounding aircraft identifications.
2. Aircraft call signs, including:

(a) Aircraft having an International Civil Aviation Organization three letter designator (ICAO 3LD) and other aircraft with an FAA authorized call sign (U.S. special or local).

(b) Aircraft with a military call sign.

3. Foreign aircraft using the foreign civil registration number as identification.

### REFERENCE-

*FAA Order JO 7110.65, Para 2-4-15, Emphasis for Clarity.*

*FAA Order JO 7110.65, Para 2-4-20, Aircraft Identification.*

*FAA Order JO 7610.12, Assignment and Authorization of Call Sign Designators and Associated Telephonies.*

- c. Omit the facility identification after communication has been established.

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

- e. 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.

**d.** Fourth priority. Movement messages on VFR aircraft.

## 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/interfacility communications:

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

### NOTE—

*Other means of identifying a position, such as substituting departure or arrival gate/fix names for position identification, may be used. However, it must be operationally beneficial, and the procedure fully covered in a letter of agreement or a facility directive, as appropriate.*

### EXAMPLE—

**Caller:** “Albuquerque Center Sixty Three, Amarillo Departure.”

**Receiver:** “Albuquerque Center.”

**b.** Between two facilities which utilize numeric position identification, the caller must identify both facility and position.

### EXAMPLE—

**Caller:** “Albuquerque Sixty Three, Fort Worth Eighty Two.”

**c.** Caller states the type of coordination to be accomplished when advantageous. For example, handoff or APREQ.

**d.** The caller states the message.

**e.** The receiver states the response to the caller’s message followed by the receiver’s operating initials.

**f.** The caller states his or her operating initials.

### EXAMPLE—

**1.**

**Caller:** “Denver High, R Twenty-five.”

**Receiver:** “Denver High.”

**Caller:** “Request direct Denver for Northwest Three Twenty-eight.”

**Receiver:** “Northwest Three Twenty-eight direct Denver approved. H.F.”

**Caller:** “G.M.”

**2.**

**Receiver:** “Denver High, Go ahead override.”

**Caller:** “R Twenty-five, Request direct Denver for Northwest Three Twenty-eight.”

**Receiver:** “Northwest Three Twenty-eight direct Denver approved. H.F.”

**Caller:** “G.M.”

**3.**

**Caller:** (“Bolos” is a departure gate in Houston ARTCC’s Sabine sector)—“Bolos, Houston local.”

**Receiver:** “Bolos.”

**Caller:** “Request Flight Level three five zero for American Twenty-five.”

**Receiver:** “American Twenty-five Flight Level three five zero approved, A.C.”

**Caller:** “G.M.”

**4.**

**Caller:** “Sector Twelve, Ontario Approach, APREQ.”

**Receiver:** “Sector Twelve.”

**Caller:** “Cactus Five forty-two heading one three zero and climbing to one four thousand.”

**Receiver:** “Cactus Five forty-two heading one three zero and climbing to one four thousand approved. B.N.”

**Caller:** “A.M.”

**5.**

**Caller:** “Zanesville, Columbus, seventy-three line, handoff.”

**Receiver:** “Zanesville.”

**Caller:** “Five miles east of Appleton VOR, United Three Sixty-six.”

**Receiver:** “United Three Sixty-six, radar contact, A.Z.”

**Caller:** “M.E.”

**g.** Identify the interphone voice line on which the call is being made when two or more such lines are collocated at the receiving operating position.

**EXAMPLE–**

“Washington Center, Washington Approach on the Fifty Seven line.”

“Chicago Center, O’Hare Tower handoff on the Departure West line.”

**h. TERMINAL.** The provisions of subparas a, b, c, e, f, g, and Paragraph 2–4–13, Interphone Message Termination, may be omitted provided:

**1.** Abbreviated standard coordination procedures are contained in a facility 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.

## 2–4–13. INTERPHONE MESSAGE TERMINATION

Terminate interphone messages with your operating initials.

## 2–4–14. WORDS AND PHRASES

**a.** Use the words or phrases in radiotelephone and interphone communication as contained in the P/CG or, within areas where Controller Pilot Data Link Communications (CPDLC) is in use, the phraseology contained in the applicable CPDLC message set.

**b.** The word *super* must be used as part of the identification in all communications with or about super aircraft.

**c.** The word *heavy* must be used as part of the identification in all communications with or about heavy aircraft.

**d. EN ROUTE.** The use of the words *super* or *heavy* may be omitted except as follows:

**1.** In communications with a terminal facility about super or heavy aircraft operations.

**2.** In communications with or about super or heavy aircraft with regard to an airport where the en route center is providing approach control service.

**3.** In communications with or about super or heavy aircraft when the separation from a following aircraft may become less than 5 miles by approved procedure.

**4.** When issuing traffic advisories.

**EXAMPLE–**

“United Fifty-Eight Heavy.”

**NOTE–**

Most airlines will use the word “*super*” or “*heavy*” following the company prefix and flight number when establishing communications or when changing frequencies within a terminal facility’s area.

**e.** When in radio communications with “Air Force One” or “Air Force Two,” do not add the heavy designator to the call sign. State only the call sign “Air Force One/Two” regardless of the type aircraft.

## 2–4–15. EMPHASIS FOR CLARITY

**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–**

FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.

FAA Order JO 7110.65, Para 2–4–9, Abbreviated Transmissions.

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

**EXAMPLE–**

“United Thirty-one United.”

“American Thirty-one American.”

**NOTE–**

Similar sounding call signs procedures may apply to ICAO 3LD U.S. special, local, or military call sign.

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

**EXAMPLE–**

*“United Thirty-one United, Miami Center, U.S. Air Thirty-one is also on this frequency, acknowledge.”*

*“U.S. Air Thirty-one U.S. Air, Miami Center, United Thirty-one is also on this frequency, acknowledge.”*

d. Notify the operations supervisor-in-charge of any duplicate call signs or phonetically similar-sounding call signs when the aircraft are operating simultaneously within the same sector.

**REFERENCE–**

FAA Order JO 7210.3, Para 2–1–14, Aircraft Identification Problems.

## 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
0	Zero	ZE–RO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	FOW–ER
5	Five	FIFE
6	Six	SIX
7	Seven	SEV–EN
8	Eight	AIT
9	Nine	NIN–ER
A	Alfa	ALFAH
B	Bravo	BRAHVOH
C	Charlie	CHARLEE
D	Delta	DELLTAH
E	Echo	ECKOH
F	Foxtrot	FOKSTROT
G	Golf	GOLF
H	Hotel	HOHTELL
I	India	INDEE AH
J	Juliett	JEWLEE ETT
K	Kilo	KEYLOH
L	Lima	LEEMAH
M	Mike	MIKE
N	November	NOVEMBER

O	Oscar	OSSCAH
P	Papa	PAHPAH
Q	Quebec	KEHBECK
R	Romeo	ROWME OH
S	Sierra	SEEAIRAH
T	Tango	TANGGO
U	Uniform	YOUNEE FORM
V	Victor	VIKTAH
W	Whiskey	WISSKEY
X	X-ray	ECKSRAY
Y	Yankee	YANGKEY
Z	Zulu	ZOOLoo

**NOTE–**

Syllables to be emphasized in pronunciation are in bold face.

## 2–4–17. NUMBERS USAGE

State numbers as follows:

a. Serial numbers. The separate digits.

**EXAMPLE–**

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

b. Altitudes or flight levels:

1. Altitudes. Pronounce each digit in the number of hundreds or thousands followed by the word “hundred” or “thousand” as appropriate.

**EXAMPLE–**

Number	Statement
10,000	“One zero thousand.”
11,000	“One one thousand.”
17,900	“One seven thousand niner hundred.”

**NOTE–**

Altitudes may be restated in group form for added clarity if the controller chooses.

**EXAMPLE–**

Number	Statement
10,000	“Ten thousand.”
11,000	“Eleven thousand.”
17,900	“Seventeen thousand niner hundred.”

**2. Flight levels.** The words “flight level” followed by the separate digits of the flight level.

**EXAMPLE–**

Flight Level	Statement
180	“Flight level one eight zero.”
275	“Flight level two seven five.”

**3. MDA/DH Altitudes.** The separate digits of the MDA/DH altitude.

**EXAMPLE–**

MDA/DH Altitude	Statement
1,320	“Minimum descent altitude, one three two zero.”
486	“Decision height, four eight six.”

**c. Time:**

**1. General time information.** The four separate digits of the hour and minute/s in terms of UTC.

**EXAMPLE–**

UTC	Time (12 hour)	Statement
0715	1:15 a.m. CST	“Zero seven one five.”
1915	1:15 p.m. CST	“One niner one five.”

**2. Upon request.** The four separate digits of the hours and minute/s in terms of UTC followed by the local standard time equivalent; or the local time equivalent only. Local time may be based on the 24-hour clock system, and the word “local” or the time zone equivalent must be stated when other than UTC is referenced. The term “ZULU” may be used to denote UTC.

**EXAMPLE–**

UTC	Time (24 hour)	Time (12 hour)	Statement
2230	1430 PST	2:30 p.m.	“Two two three zero, one four three zero Pacific or Local.” or “Two-thirty P-M.”

**3. Time check.** The word “time” followed by the four separate digits of the hour and minutes, and nearest quarter minute. Fractions of a quarter minute less than eight seconds are stated as the preceding quarter minute; fractions of a quarter minute of eight

seconds or more are stated as succeeding quarter minute.

**EXAMPLE–**

Time	Statement
1415:06	“Time, one four one five.”
1415:10	“Time, one four one five and one-quarter.”

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

**EXAMPLE–**

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. The number “0” as “zero”** except where it is used in approved “group form” for authorized aircraft call signs, and in stating altitudes.

**EXAMPLE–**

As Zero	As Group
“Field elevation one six zero.”	“Western five thirty.”
“Heading three zero zero.”	“EMAIR One Ten.”
“One zero thousand five hundred.”	“Ten thousand five hundred.”

**f. Altimeter setting.** The word “altimeter” followed by the separate digits of the altimeter setting.

**EXAMPLE–**

Setting	Statement
30.01	“Altimeter, three zero zero one.”

**g. Surface wind.** The word “wind” followed by the separate digits of the indicated wind direction to the nearest 10-degree multiple, the word “at” and the separate digits of the indicated velocity in knots, to include any gusts.

**EXAMPLE–**

*“Wind zero three zero at two five.”*

*“Wind two seven zero at one five gusts three five.”*

**h. 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.”

**i. Radar beacon codes.** The separate digits of the 4–digit code.

**EXAMPLE–**

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

**j. 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
3	“Runway Three.”
8L	“Runway Eight Left.”
27R	“Runway Two Seven Right.”

**k. Frequencies.**

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

**(a)** Omit digits after the second digit to the right of the decimal point.

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

**EXAMPLE–**

Frequency	Statement
126.55 MHz	“One two six point five five.”
369.0 MHz	“Three six niner point zero.”

121.5 MHz	“One two one point five.”
135.275 MHz	“One three five point two seven.”
302 kHz	“Three zero two kiloHertz.”

**2. USAF/USN.** 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 facilities use the same channelization.

**EXAMPLE–**

Frequency	Statement
275.8 MHz	“Local channel one six.”

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

**l. Speeds.**

**1.** The separate digits of the speed followed by “knots” except as required by Paragraph 5–7–2, Methods.

**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.”

**m. Miles.** The separate digits of the mileage followed by the word “mile.”

**EXAMPLE–**

*“Three zero mile arc east of Nottingham.”*

*“Traffic, one o’clock, two five miles, northbound, D–C Eight, flight level two seven zero.”*

**2–4–18. NUMBER CLARIFICATION**

**a.** If deemed necessary for clarity, and after stating numbers as specified in Paragraph 2–4–17, Numbers Usage, controllers may restate numbers using either group or single-digit form.

**EXAMPLE–**

*“One Seven Thousand, Seventeen Thousand.”*

*“Altimeter Two Niner Niner Two, Twenty Nine Ninety Two.”*

*“One Two Six Point Five Five, One Twenty Six Point Fifty Five.”*

**2-4-19. FACILITY IDENTIFICATION**

Identify facilities as follows:

**a.** Airport traffic control towers. State the name of the facility followed by the word “tower.” Where military and civil airports are located in the same general area and have similar names, state the name of the military service followed by the name of the military facility and the word “tower.”

**EXAMPLE–**

*“Columbus Tower.”*

*“Barksdale Tower.”*

*“Navy Jacksonville Tower.”*

**b.** Air route traffic control centers. State the name of the facility followed by the word “center.”

**c.** Approach control facilities, including RAPCONs, RATCFs, and ARACs. State the name of the facility followed by the word “approach.” Where military and civil facilities are located in the same general area and have similar names, state the name of the military service followed by the name of the military facility and the word “approach.”

**EXAMPLE–**

*“Denver Approach.”*

*“Griffiss Approach.”*

*“Navy Jacksonville Approach.”*

**d.** Functions within a terminal facility. State the name of the facility followed by the name of the function.

**EXAMPLE–**

*“Boston Departure.”*

*“LaGuardia Clearance Delivery.”*

*“O’Hare Ground.”*

**e.** When calling or replying on an interphone line which connects only two non-VSCS equipped facilities, you may omit the facility name.

**EXAMPLE–**

*“Bradford High, Handoff.”*

**f.** FAA flight service stations. State the name of the station followed by the word “radio.”

**EXAMPLE–**

*“Altoona Radio.”*

**g.** Radar facilities having ASR or PAR but not providing approach control service. State the name of the facility, followed by the letters “G–C–A.”

**EXAMPLE–**

*“Corpus Christi G–C–A.”*

*“Davison 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/her initial callup except use the correct identification after communications have been established. Identify aircraft as follows:

**a.** U.S. registry aircraft. State one of the following:

**REFERENCE–**

*FAA Order JO 7110.65, Para 2-4-8, Radio Message Format.*

*FAA Order JO 7110.65, Para 2-4-9, Abbreviated Transmissions.*

*FAA Order JO 7110.65, Para 2-4-15, Emphasis for Clarity.*

*FAA Order JO 7110.65, Para 2-4-17, Numbers Usage.*

**1.** Civil. State the prefix “November” when establishing initial communications with U.S. registered aircraft followed by the ICAO phonetic pronunciation of the numbers/letters of the aircraft registration. The controller may state the aircraft type, the model, the manufacturer’s name, followed by the ICAO phonetic pronunciation of the numbers/letters of the aircraft registration if used by the pilot on the initial or subsequent call.

**EXAMPLE–**

*Air traffic controller’s initiated call:*

*“November One Two Three Four Golf.”*

*“November One Two Three Four.”*

*Responding to pilot’s initial or subsequent call:*

*“Jet Commander One Two Three Four Papa.”*

*“Bonanza One Two Three Four Tango.”*

*“Sikorsky Six Three Eight Mike Foxtrot.”*

**NOTE–**

*If aircraft identification becomes a problem when the procedures specified above are used, see paragraph 2-4-15, Emphasis for Clarity.*

**2.** Aircraft having an ICAO 3LD and other FAA authorized call sign (U.S. special or local). State the call sign followed by the flight number in group form.

**NOTE–**

*“Group form” is the pronunciation of a series of numbers as the whole number, or pairs of numbers they represent rather than pronouncing each separate digit. The use of*

group form may, however, be negated by four-digit identifiers or the placement of zeros in the identifier.

**EXAMPLE–**

“American Fifty–Two.”  
 “Delta One Hundred.”  
 “Eastern Metro One Ten.”  
 “General Motors Thirty Fifteen.”  
 “United One Zero One.”  
 “Delta Zero One Zero.”  
 “TWA Ten Zero Four.”

**NOTE–**

For clarity, aircraft having an ICAO 3LD and other FAA authorized call sign may be pronounced using single digits if necessary.

**EXAMPLE–**

“United Five One Seven.”  
 “United Five Seven Zero.”

**NOTE–**

For procedures that address similar sounding call signs, see paragraph 2–4–15, *Emphasis for Clarity*.

**REFERENCE–**

FAA Order JO 7610.12, *Assignment and Authorization of Call Sign Designators and Associated Telephonies*.

**3.** Air taxi and commercial operators not having FAA authorized call signs. State the prefix “TANGO” on initial contact, if used by the pilot, followed by the registration number. The prefix may be dropped in subsequent communications.

**EXAMPLE–**

“Tango Mooney Five Five Five Two Quebec.”  
 “Tango November One Two Three Four.”

**4.** Air carrier/taxi ambulance. State the prefix “MEDEVAC” if used by the pilot, followed by the call sign and flight number in group form.

**EXAMPLE–**

“MEDEVAC Delta Fifty-One.”

**5.** Civilian air ambulance. State the word “MEDEVAC” followed by the numbers/letters of the registration number.

**EXAMPLE–**

“MEDEVAC Two Six Four Six.”

**6.** U.S. military. State one of the following:

(a) The service name, followed by the word “copter,” when appropriate, and the last 5 digits of the serial number.

**EXAMPLE–**

“Navy Five Six Seven One Three.”  
 “Coast Guard Six One Three Two Seven.”

“Air Guard One Three Five Eight Six.”  
 “Army Copter Three Two One Seven Six.”

**NOTE–**

If aircraft identification becomes a problem, the procedures reflected in FAA Order JO 7210.3, *Facility Operation and Administration*, Paragraph 2–1–14, *Aircraft Identification Problems*, will apply.

(b) Special military operations. State one of the following followed by the last 5 digits of the serial number:

(c) Air evacuation flights. “AIR EVAC,” “MARINE AIR EVAC,” or “NAVY AIR EVAC.”

**EXAMPLE–**

“Air Evac One Seven Six Five Two.”

(d) Rescue flights. (Service name) “RESCUE.”

**EXAMPLE–**

“Air Force Rescue Six One Five Seven Niner.”

(e) Air Mobility Command. “REACH.”

**EXAMPLE–**

“Reach Seven Eight Five Six Two.”

(f) Special Air Mission. “SAM.”

**EXAMPLE–**

“Sam Niner One Five Six Two.”

(g) USAF Contract Aircraft “LOGAIR.”

**EXAMPLE–**

“Logair Seven Five Eight Two Six.”

(h) Military tactical and training:

(1) U.S. Air Force, Air National Guard, Military District of Washington priority aircraft, and USAF civil disturbance aircraft. Pronounceable words of 3 to 6 letters followed by a 1 to 5 digit number.

**EXAMPLE–**

“Paul Two Zero.”  
 “Pat One Five Seven.”  
 “Gaydog Four.”

**NOTE–**

When the “Z” suffix described in para 2–3–7, *USAF/USN Undergraduate Pilots*, is added to identify aircraft piloted by USAF undergraduate pilots, the call sign will be limited to a combination of six characters.

(2) Navy or Marine fleet and training command aircraft. The service name and 2 letters, or a digit and a letter (use letter phonetic equivalents), followed by 2 or 3 digits.

**EXAMPLE–**

*“Navy Golf Alfa Two One.”*

*“Marine Four Charlie Two Three Six.”*

**7. Presidential aircraft and Presidential family aircraft:**

(a) When the President is aboard a military aircraft, state the name of the military service, followed by the word “One.”

**EXAMPLE–**

*“Air Force One.”*

*“Army One.”*

*“Marine One.”*

(b) When the President is aboard a civil aircraft, state the words “Executive One.”

(c) When a member of the President’s family is aboard any aircraft, if the U.S. Secret Service or the White House Staff determines it is necessary, state the words “Executive One Foxtrot.”

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–4, Operational Priority.

**8. Vice Presidential aircraft:**

(a) When the Vice President is aboard a military aircraft, state the name of the military service, followed by the word “Two.”

**EXAMPLE–**

*“Air Force Two.”*

*“Army Two.”*

*“Marine Two.”*

(b) When the Vice President is aboard a civil aircraft, state the words “Executive Two.”

(c) When a member of the Vice President’s family is aboard any aircraft, if the U.S. Secret Service or the White House Staff determines it is necessary, state the words “Executive Two Foxtrot.”

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–4, Operational Priority.

**9. DOT and FAA flights.** The following alphanumeric identifiers and radio/interphone call signs are established for use in air/ground communications when the Secretary of Transportation, Deputy Secretary of Transportation, FAA Administrator or FAA Deputy Administrator have a requirement to identify themselves. (See TBL 2–4–2.)

**TBL 2–4–2**

**DOT and FAA Alphanumeric Identifiers  
and Call Signs**

Official	Identifier	Call Sign
Secretary of Transportation	DOT–1	Transport–1
Deputy Secretary of Transportation	DOT–2	Transport–2
Administrator, Federal Aviation Administration	FAA–1	Safeair–1
Deputy Administrator, Federal Aviation Administration	FAA–2	Safeair–2

**10. Other Special Flights.**

(a) Department of Energy flights. State the letters “R–A–C” (use phonetic alphabet equivalents) followed by the last 4 separate digits of the aircraft registration number.

**EXAMPLE–**

*“Romeo Alfa Charlie One Six Five Three.”*

(b) Flight Inspection of navigational aids. State the call sign “FLIGHT CHECK” followed by the digits of the registration number.

**EXAMPLE–**

*“Flight Check Three Niner Six Five Four.”*

(c) USAF aircraft engaged in aerial sampling missions. State the call sign “SAMP” followed by the last three digits of the serial number.

**EXAMPLE–**

*“SAMP Three One Six.”*

**REFERENCE–**

FAA Order JO 7110.65, Para 9–2–18, SAMP.

**11. Use a pilot’s name in identification of an aircraft only in special or emergency situations.**

**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 full aircraft registration, or state the letters or digits of the full aircraft registration. Do not abbreviate.

**EXAMPLE–**

*“Citation C–G–L–R–B.”*

*“C–G–L–R–B.”*

**NOTE–**

**1. Letters may be spoken individually or phonetically.**

**2. Some foreign civil aircraft registrations begin with a number.**

**REFERENCE–**

FAA Order JO 7110.65, Para 2–4–9, Abbreviated Transmissions.

**2. ICAO 3LD.** State the associated telephony followed by the flight number in group form, or

separate digits may be used if that is the format used by the pilot. Do not abbreviate.

**EXAMPLE–**

*“Scandinavian Sixty-eight.”*

*“Scandinavian Six Eight.”*

**3. Foreign Military.** Except for military services identified in FAA Order JO 7340.2, Contractions, **state** the name of the country and the military service followed by the separate digits or letters of the registration or call sign. For military services listed in FAA Order JO 7340.2, **state** the approved telephony followed by the separate digits of the **flight** number.

**EXAMPLE–**

*“Canforce Five Six Two Seven.”*

*“Brazilian Air Force Five Three Two Seven.”*

## 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
2. Service and type, or
3. Type only if no confusion or misidentification is likely.

**b. Air Carrier:**

1. Manufacturer’s model or type designator.
2. Add the manufacturer’s name, company name or other identifying features when confusion or misidentification is likely.

**EXAMPLE–**

*“L-Ten-Eleven.”*

*“American MD-Eighty. Seven Thirty-Seven.”*

*“Boeing Seven Fifty-Seven.”*

**NOTE–**

Pilots of “interchange” aircraft are expected to inform the

tower on the first radio contact the name of the operating company and trip number followed by the company name, as displayed on the aircraft, and the aircraft type.

**c. General Aviation and Air Taxi:**

1. Manufacturer’s model or type designator.
2. Manufacturer’s name, or add color when considered advantageous.

**EXAMPLE–**

*“Tri-Pacer.”*

*“P A Twenty-Two.”*

*“Cessna Four-Oh-One.”*

*“Blue and white King Air.”*

*“Airliner.”*

*“Sikorsky S-Seventy-Six.”*

**d.** When issuing traffic information to aircraft following a super aircraft, specify the word *super* before the manufacturer’s name and model.

**e.** When issuing traffic information to aircraft following a heavy aircraft, specify the word *heavy* before the manufacturer’s name and model.

**EXAMPLE–**

*“Super A-Three-Eighty” or “Super*

*A-three-eighty-eight.”*

*“Heavy C-Seventeen.”*

*“Heavy Boeing Seven Forty-Seven.”*

**REFERENCE–**

FAA Order JO 7110.65, Para 2-1-21, Traffic Advisories.

## 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–**

*“Cessna 123 Mike Romeo cleared to enter Bravo airspace.”*

*“Sikorsky 123 Tango Sierra cleared to enter New York Bravo airspace.”*



e. If the receiving facility informs you that weather reports are not required for a specific time period, discontinue the reports.

f. *EN ROUTE*. When you determine that weather reports for an airport will not be required for a specific time period, inform the FSS or tower of this determination.

**REFERENCE–**

FAA Order JO 7110.65, Para 3–10–2, Forwarding Approach Information by Nonapproach Control Facilities.

## 2–6–4. ISSUING WEATHER AND CHAFF AREAS

a. Controllers must issue pertinent information on observed/reported weather and chaff areas to potentially affected aircraft. Define the area of coverage in terms of:

1. Azimuth (by referring to the 12–hour clock) and distance from the aircraft and/or

2. The general width of the area and the area of coverage in terms of fixes or distance and direction from fixes.

**NOTE–**

*Weather significant to the safety of aircraft includes conditions such as funnel cloud activity, lines of thunderstorms, embedded thunderstorms, large hail, wind shear, microbursts, moderate to extreme turbulence (including CAT), and light to severe icing.*

**REFERENCE–**

AIM, Paragraph 7–1–14, ATC Inflight Weather Avoidance Assistance.

**PHRASEOLOGY–**

*WEATHER/CHAFF AREA BETWEEN (number) O’CLOCK AND (number) O’CLOCK (number) MILES, and/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).*

b. Inform any tower for which you provide approach control services of observed precipitation on radar which is likely to affect their operations.

c. Use the term “precipitation” when describing radar–derived weather. Issue the precipitation intensity from the lowest descriptor (LIGHT) to the highest descriptor (EXTREME) when that information is available. Do not use the word “turbulence” in describing radar–derived weather.

1. LIGHT.

2. MODERATE.

3. HEAVY.

4. EXTREME.

**NOTE–**

*Weather and Radar Processor (WARP) does not display light intensity.*

**PHRASEOLOGY–**

*AREA OF (Intensity) PRECIPITATION BETWEEN (number) O’CLOCK AND (number) O’CLOCK, (number) MILES, MOVING (direction) AT (number) KNOTS, TOPS (altitude). AREA IS (number) MILES IN DIAMETER.*

**EXAMPLE–**

1. “Area of heavy precipitation between ten o’clock and two o’clock, one five miles. Area is two five miles in diameter.”

2. “Area of heavy to extreme precipitation between ten o’clock and two o’clock, one five miles. Area is two five miles in diameter.”

**REFERENCE–**

P/CG Term– Precipitation Radar Weather Descriptions.

d. *TERMINAL*: In STARS, ARTS, and other systems that display six levels of precipitation intensities, correlate precipitation descriptors from subparagraph c as follows:

1. Level 1 = LIGHT

2. Level 2 = MODERATE

3. Levels 3 and 4 = HEAVY

4. Levels 5 and 6 = EXTREME

e. When precipitation intensity information is not available.

**PHRASEOLOGY–**

*AREA OF PRECIPITATION BETWEEN (number) O’CLOCK AND (number) O’CLOCK, (number) MILES. MOVING (direction) AT (number) KNOTS, TOPS (altitude). AREA IS (number) MILES IN DIAMETER, INTENSITY UNKNOWN.*

**EXAMPLE–**

“Area of precipitation between one o’clock and three o’clock, three five miles moving south at one five knots, tops flight level three three zero. Area is three zero miles in diameter, intensity unknown.”

**NOTE–**

*Phraseology using precipitation intensity descriptions is only applicable when the radar precipitation intensity information is determined by NWS radar equipment or NAS ground based digitized radar equipment with weather capabilities. This precipitation may not reach the surface.*

**f. EN ROUTE.** When issuing Air Route Surveillance Radar (ARSR) precipitation intensity use the following:

1. Describe the lowest displayable precipitation intensity as MODERATE.
2. Describe the highest displayable precipitation intensity as HEAVY to EXTREME.

**PHRASEOLOGY–**

*AREA OF (Intensity) PRECIPITATION BETWEEN (number) O’CLOCK and (number) O’CLOCK, (number) MILES, MOVING (direction) AT (number) KNOTS, TOPS (altitude). If applicable, AREA IS (number) MILES IN DIAMETER.*

**EXAMPLE–**

1. “Area of moderate precipitation between ten o’clock and one o’clock, three zero miles moving east at two zero knots, tops flight level three seven zero.
2. “Area of moderate precipitation between ten o’clock and three o’clock, two zero miles. Area is two five miles in diameter.”

**g.** Controllers must ensure that the highest available level of precipitation intensity within their area of jurisdiction is displayed unless operational/equipment limitations exist.

**h.** When requested by the pilot, provide radar navigational guidance and/or approve deviations around weather or chaff areas. In areas of significant weather, plan ahead and be prepared to suggest, upon pilot request, the use of alternative routes/altitudes.

1. An approval for lateral deviation authorizes the pilot to maneuver left or right within the limits of the lateral deviation area.

**REFERENCE–**

AIM, Paragraph 7–1–14b, 1. (a) ATC Inflight Weather Avoidance Assistance

2. When approving a weather deviation for an aircraft that had previously been issued a crossing altitude, including climb via or descend via clearances, issue an altitude to maintain and, if necessary, assign a speed along with the clearance to deviate. If you intend on clearing the aircraft to resume the procedure, advise the pilot.

**PHRASEOLOGY–**

*DEVIATION (restrictions, if necessary) APPROVED, MAINTAIN (altitude), (if necessary) MAINTAIN (speed), (if applicable) EXPECT TO RESUME (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–**

FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments.  
FAA Order JO 7110.65, Para 5–6–1, Application.  
FAA Order JO 7110.65, Para 5–6–2, Methods.

3. If a pilot enters your area of jurisdiction already deviating for weather, advise the pilot of any additional weather which may affect the route.

4. If traffic and airspace (i.e., special use airspace boundaries, LOA constraints) permit, combine the approval for weather deviation with a clearance on course.

**PHRASEOLOGY–**

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

or

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

**EXAMPLE–**

1. “Deviation 20 degrees right approved, when able proceed direct O’Neill VORTAC and advise.” En Route: The corresponding fourth line entry is “D20R/ONL” or “D20R/F.”
2. “Deviation 30 degrees left approved, when able fly heading zero niner zero, vector to join J324 and advise.” En Route: In this case the free text character limitation prevents use of fourth line coordination and verbal coordination is required.

5. If traffic or airspace prevents you from clearing the aircraft on course at the time of the approval for a weather deviation, instruct the pilot to advise when clear of weather.

**PHRASEOLOGY–**

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

**EXAMPLE–**

*“Deviation North of course approved, advise clear of weather.”*

*En Route: In this case the corresponding fourth line entry is “DN,” and the receiving controller must provide a clearance to rejoin the route in accordance with paragraph 2–1–15c.*

i. When a deviation cannot be approved as requested because of traffic, take an alternate course of action that provides positive control for traffic resolution and satisfies the pilot’s need to avoid weather.

**PHRASEOLOGY–**

*UNABLE REQUESTED DEVIATION, FLY HEADING (heading), ADVISE CLEAR OF WEATHER*

*or*

*UNABLE REQUESTED DEVIATION, TURN (number of degrees) DEGREES (left or right) VECTOR FOR TRAFFIC, ADVISE CLEAR OF WEATHER,*

**EXAMPLE–**

*“Unable requested deviation, turn thirty degrees right vector for traffic, advise clear of weather.”*

j. When forwarding weather deviation information, the transferring controller must clearly coordinate the nature of the route guidance service being provided. This coordination should include, but is not limited to: assigned headings, suggested headings, pilot-initiated deviations. Coordination can be accomplished by: verbal, automated, or predetermined procedures. Emphasis should be made between: controller assigned headings, suggested headings, or pilot initiated deviations.

**EXAMPLE–**

*“(call sign) assigned heading three three zero for weather avoidance”*

*“(call sign) deviating west, pilot requested...”*

**REFERENCE–**

*FAA Order JO 7110.65, Para 2–1–14, Coordinate Use Of Airspace  
FAA Order JO 7110.65, Para 5–4–5, Transferring Controller Handoff  
FAA Order JO 7110.65, Para 5–4–6, Receiving Controller Handoff  
FAA Order JO 7110.65, Para 5–4–9, Prearranged Coordination  
FAA Order JO 7110.65, Para 5–4–10, En Route Fourth Line Data Block Usage*

**k. En Route Fourth Line Data Transfer**

1. The inclusion of a NAVAID, waypoint, or /F in the fourth line data indicates that the pilot has been authorized to deviate for weather and must rejoin the route at the next NAVAID or waypoint in the route of flight.

**REFERENCE–**

*FAA Order JO 7110.65, Para 5–4–10, En Route Fourth Line Data Block Usage*

**EXAMPLE–**

*“Deviation twenty degrees right approved, when able proceed direct O’Neill VORTAC and advise.” In this case, the corresponding fourth line entry is “D20R/ONL” or “D20R/F.”*

2. The absence of a NAVAID, waypoint, or /F in the fourth line indicates that:

(a) The pilot has been authorized to deviate for weather only, and the receiving controller must provide a clearance to rejoin the route in accordance with paragraph 2–1–15c.

**EXAMPLE–**

*“Deviation twenty degrees right approved, advise clear of weather.”*

(b) The free text character limitation prevents the use of fourth line coordination. Verbal coordination is required.

**EXAMPLE–**

*“Deviation 30 degrees left approved, when able fly heading zero niner zero, vector to join J324 and advise.”*

1. The supervisory traffic management coordinator-in-charge/operations supervisor/controller-in-charge must verify the digitized radar weather information by the best means available (e.g., pilot reports, local tower personnel, etc.) if the weather data displayed by digitized radar is reported as questionable or erroneous. Errors in weather radar presentation must be reported to the technical operations technician and the air traffic supervisor must determine if the digitized radar derived weather data is to be displayed and a NOTAM distributed.

**NOTE–**

*Anomalous propagation (AP) is a natural occurrence affecting radar and does not in itself constitute a weather circuit failure.*

**2–6–5. DISSEMINATING OFFICIAL WEATHER INFORMATION**

**TERMINAL.** Observed elements of weather information must 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 facilities 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.

**NOTE–**

*USAF controllers do not serve as official weather observers.*

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 obtained from a FAA approved automation surface weather system.

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

## 2-6-6. HAZARDOUS INFLIGHT WEATHER ADVISORY

Controllers must advise pilots of hazardous weather that may impact operations within 150 NM of their sector or area of jurisdiction. Hazardous weather information contained in the advisories includes Airmen's Meteorological Information (AIRMET), Significant Meteorological Information (SIGMET), Convective SIGMET (WST), Urgent Pilot Weather Reports (UUA), and Center Weather Advisories (CWA). Facilities must review alert messages to determine the geographical area and operational impact of hazardous weather information. Advisories are not required if aircraft on your frequency(s) will not be affected.

a. Controllers must broadcast a hazardous inflight weather advisory on all frequencies, except emergency frequency, upon receipt of hazardous weather information. Controllers are required to disseminate data based on the operational impact on the sector or area of control jurisdiction. Pilots requesting additional information must be directed to contact the nearest Flight Service.

**NOTE–**

*The inclusion of the type and number of weather advisory responsible for the hazardous inflight weather advisory is optional.*

**PHRASEOLOGY–**

*ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION (SIGMET, Convective SIGMET, AIRMET, Urgent Pilot Weather Report (UUA), or Center Weather Advisory (CWA), Number or Numbers) FOR (specific weather phenomenon) WITHIN (geographical area), AVAILABLE ON FLIGHT SERVICE FREQUENCIES.*

b. Terminal facilities have the option to limit hazardous weather information broadcasts as follows: Tower cab and approach control facilities may opt to broadcast hazardous weather information alerts only when any part of the area described is within 50 NM of the airspace under their jurisdiction.

**REFERENCE–**

*AIM, Chapter 7, Section 1, Meteorology, Para 7-1-5 through Para 7-1-9.*

c. **EN ROUTE.** ERAM. Controllers must electronically acknowledge hazardous weather information messages after appropriate action has been taken.

**NOTE–**

*EN ROUTE. While hazardous weather information is commonly distributed via the SIGMET View, it is possible to receive the information via the GI View.*

## Section 8. Runway Visibility Reporting– Terminal

### 2–8–1. FURNISH RVR VALUES

Where RVR equipment is operational, irrespective of subsequent operation or nonoperation 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 Paragraph 2–8–3, Terminology.

**NOTE–**

*Readout capability of different type/model RVR equipment varies. For example, older equipment minimum readout value is 600 feet. Newer equipment may have minimum readout capability as low as 100 feet. Readout value increments also may differ. Older equipment have minimum readout increments of 200 feet. New equipment increments below 800 feet are 100 feet.*

**REFERENCE–**

*FAA Order 6560.10, Runway Visual Range (RVR).  
FAA Order 6750.24, Instrument Landing System (ILS) and Ancillary Electronic Component Configuration & Perf. Req.*

### 2–8–2. ARRIVAL/DEPARTURE RUNWAY VISIBILITY

**a.** Issue current touchdown RVR for the runway(s) in use:

**1.** When prevailing visibility is 1 mile or less regardless of the value indicated.

**2.** When RVR indicates a reportable value regardless of the prevailing visibility.

**NOTE–**

*Reportable values are RVR 6,000 feet or less.*

**3.** When it is determined from a reliable source that the indicated RVR value differs by more than 400 feet from the actual conditions within the area of the transmissometer, the RVR data is not acceptable and must not be reported.

**NOTE–**

*A reliable source is considered to be a certified weather observer, automated weather observing system, air traffic controller, flight service specialist, or pilot.*

**4.** When the observer has reliable reports, or has otherwise determined that the instrument values are

not representative of the associated runway, the data must not be used.

**b.** Issue both mid-point and roll-out RVR when the value of either is less than 2,000 feet and the touchdown RVR is greater than the mid-point or roll-out RVR.

**c.** Local control must issue the current RVR to each aircraft prior to landing or departure in accordance with subparagraphs a and b.

### 2–8–3. TERMINOLOGY

**a.** Provide RVR information by stating the runway, the abbreviation RVR, and the indicated value. When issued along with other weather elements, transmit these values in the normal sequence used for weather reporting.

**EXAMPLE–**

*“Runway One Four RVR Two Thousand Four Hundred.”*

**b.** When two or more RVR systems serve the runway in use, report the indicated values for the different systems in terms of touchdown, mid, and rollout as appropriate.

**EXAMPLE–**

*“Runway Two Two Left RVR Two Thousand, rollout One Thousand Eight Hundred.”*

*“Runway Two Seven Right RVR One Thousand, mid Eight Hundred, rollout Six Hundred.”*

**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–**

*“Runway Three Six RVR more than Six Thousand.”*

*“Runway Niner RVR One Thousand, rollout less than Six Hundred.”*

**d.** When a readout indicates a rapidly varying visibility condition (1,000 feet or more for RVR), report the current value followed by the range of visibility variance.

***EXAMPLE–***

*“Runway Two Four RVR Two Thousand, variable One Thousand Six Hundred to Three Thousand.”*

***REFERENCE–***

*FAA Order JO 7110.65, Para 2–8–1, Furnish RVR Values.*

## Section 9. Automatic Terminal Information Service Procedures

### 2-9-1. APPLICATION

Use the ATIS, where available, to provide advance noncontrol airport/terminal area 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. Automated systems will have the phonetic letter code automatically appended. Exceptions may be made where omissions are required because of special programs or equipment.

1. Each alphabet letter phonetic word must be used sequentially, except as authorized in subpara a2, beginning with “Alpha,” ending with “Zulu,” and repeated without regard to the beginning of a new day. Identify the first resumed broadcast message with “Alpha” or the first assigned alphabet letter word in the event of a broadcast interruption of more than 12 hours.

2. Specific sequential portions of the alphabet may be assigned between facilities or an arrival and departure ATIS when designated by a letter of agreement or facility directive.

#### REFERENCE—

FAA Order JO 7210.3, Para 10-4-1, Automatic Terminal Information Service (ATIS).

b. The ATIS recording must be reviewed for completeness, accuracy, speech rate, and proper enunciation before being transmitted.

c. Arrival and departure messages, when broadcast separately, need only contain information appropriate for that operation.

### 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/PIREPs update, etc.

b. When a pilot acknowledges that he/she has received the ATIS broadcast, controllers may omit those items contained in the broadcasts if they are current. Rapidly changing conditions will be issued by ATC, and the ATIS will contain the following:

#### EXAMPLE—

*“Latest ceiling/visibility/altimeter/wind/(other conditions) will be issued by approach control/tower.”*

c. Controllers must ensure that pilots receive the most current pertinent information by taking the following actions, as applicable:

1. When a pilot does not state the appropriate ATIS code on initial contact, ask the pilot to confirm receipt of the current ATIS information.

#### EXAMPLE—

*“Verify you have information CHARLIE.”*

*“Information CHARLIE current. Advise when you have CHARLIE.”*

2. When a pilot is unable to receive the ATIS, issue the current weather, runway in use, approach/departure information, pertinent NOTAMs, and airport conditions.

#### EXAMPLE—

*“Wind two five zero at one zero. Visibility one zero. Ceiling four thousand five hundred broken. Temperature three four. Dew point two eight. Altimeter three zero one zero. ILS—DME Runway Two Seven Approach in use. Departing Runway Two Two Right. Hazardous Weather Information for (geographical area) available on Flight Service Frequencies. Braking Action advisories are in effect.”*

d. Advise aircraft of changes to the ATIS code by broadcasting the change on all appropriate frequencies. The broadcast must include changes to pertinent operational information, when known, that necessitated the ATIS change.

**EXAMPLE–**

*“Attention all aircraft, information ALPHA current.”*

*“Attention all aircraft, information BRAVO current. MICROBURST advisories in effect.”*

*“Attention all aircraft, information CHARLIE current. Numerous flocks of ducks in the immediate vicinity of (name) airport, altitude unknown.”*

**REFERENCE–**

FAA Order JO 7110.65, Para 2–9–3, Content

**NOTE–**

**1.** No additional acknowledgement is required when a controller broadcasts information subsequent to the pilot's initial acknowledgement of the ATIS. Requiring each aircraft to acknowledge receipt of pertinent changes (broadcast) after initial confirmation of the ATIS could significantly impact workload.

**2.** Pertinent conditions are those that have a clear decisive relevance to the safety of air traffic. As noted in Paragraph 2–1–2, Duty Priority, there are many variables involved that make it virtually impossible to develop a standard list of changes that are classified as relevant to every conceivable situation. Each set of circumstances must be evaluated on its own merit, and when more than one action is required, controllers must exercise their best judgment based on the facts and circumstances known to them.

**2–9–3. CONTENT**

**a.** Include the following in ATIS broadcast as appropriate:

- 1.** Airport/facility name.
- 2.** Phonetic letter code.
- 3.** Time of the latest weather sequence (UTC).
- 4.** Weather information consisting of:
  - (a)** Wind direction and velocity.
  - (b)** Visibility.
  - (c)** Obstructions to vision.

**(d)** Present weather consisting of: sky condition, temperature, dew point, altimeter, a density altitude advisory when appropriate, and other pertinent remarks included in the official weather observation.

**REFERENCE–**

FAA Order JO 7900.5, Surface Weather Observing Table 3–2.

- 5.** Instrument approach and runway in use.

Temperature and dew point should be reported from certified direct reading sensors when available. Always include weather observation remarks of lightning, cumulonimbus, and towering cumulus clouds.

**NOTE–**

ASOS/AWOS is to be considered the primary source of wind direction, velocity, and altimeter data for weather observation purposes at those locations that are so equipped. The ASOS Operator Interface Device (OID) displays the magnetic wind as “MAG WND” in the auxiliary data location in the lower left-hand portion of the screen. Other OID displayed winds are true and are not to be used for operational purposes.

**b.** Man-Portable Air Defense Systems (MANPADS) alert and advisory. Specify the nature and location of threat or incident, whether reported or observed and by whom, time (if known), and notification to pilots to advise ATC if they need to divert.

**EXAMPLE–**

**1.** “MANPADS alert. Exercise extreme caution. MANPADS threat reported by TSA, Chicago area.” “Advise on initial contact if you want to divert.”

**2.** “MANPADS alert. Exercise extreme caution. MANPADS attack observed by tower one-half mile northwest of airfield at one-two-five-zero Zulu.” “Advise on initial contact if you want to divert.”

**REFERENCE–**

FAA Order JO 7110.65, Para 10–2–13, MANPADS Alert.

FAA Order JO 7210.3, Para 2–1–10, Handling MANPADS Incidents.

**c.** Terminal facilities must include reported unauthorized laser illumination events on the ATIS broadcast for one hour following the last report. Include the time, location, altitude, color, and direction of the laser as reported by the pilot.

**PHRASEOLOGY–**

UNAUTHORIZED LASER ILLUMINATION EVENT, (UTC time), (location), (altitude), (color), (direction).

**EXAMPLE–**

UNAUTHORIZED LASER ILLUMINATION EVENT, AT 0100z, 8 MILE FINAL RUNWAY 18R AT 3,000 FEET, GREEN LASER FROM THE SOUTHWEST.

**REFERENCE–**

FAA Order JO 7110.65, Para 10–2–14, Unauthorized Laser Illumination of Aircraft.

FAA Order JO 7210.3, Para 2–1–29, Reporting Unauthorized Laser Illumination of Aircraft.

**d.** The ceiling/sky condition, visibility, and obstructions to vision may be omitted if the ceiling is above 5,000 feet and the visibility is more than 5 miles.

**EXAMPLE–**

*A remark may be made, “The weather is better than five thousand and five.”*

**e.** Instrument/visual approach/es in use. Specify landing runway/s unless the runway is that to which the instrument approach is made. Before advertising non-precision approaches, priority should be given to available precision, then APV approaches.

**f.** Departure runway/s (to be given only if different from landing runway/s or in the instance of a “departure only” ATIS).

**g.** Taxiway closures which affect the entrance or exit of active runways, other closures which impact airport operations, other NOTAMs and PIREPs pertinent to operations in the terminal area. Inform pilots of where hazardous weather is occurring and how the information may be obtained. Include available information of known bird activity.

**REFERENCE–**

*FAA Order JO 7110.65, 2–1–23, Bird Activity Information.*

**h.** 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, facilities must continue to broadcast this information for a minimum of 30 days or until the Chart Supplement U.S. has been updated, whichever is longer.

**PHRASEOLOGY–**

*WARNING, RUNWAY (number) HAS BEEN SHORTENED, (length in feet) FEET AVAILABLE.*

**EXAMPLE–**

*“Warning, Runway One-Zero has been shortened, nine-thousand eight hundred and fifty feet available.”*

**i.** Runway Condition Codes (RwyCC) when provided. Include the time of the report.

**PHRASEOLOGY–**

*RUNWAY (number) condition codes (first value, second value, third value) AT (time),*

**EXAMPLE–**

*“Runway Two Seven, condition codes two, two, one at one zero one eight Zulu.”*

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–3–1, Landing Area Condition.*

**j.** Runway Condition Codes “3/3/3” and the statement “Slippery When Wet.”

**EXAMPLE–**

*“Runway (number) condition codes three, three, three, Slippery When Wet at one two five five Zulu.”*

**NOTE–**

*A Slippery When Wet FICON NOTAM indicates a runway has failed a friction survey, for example, due to excessive rubber build-up. Airport Operators will notify ATCT operational personnel of this concern and issue a FICON NOTAM prior to the expected arrival of rain. The FICON NOTAM will be canceled when the rain has ended and the runway environment is determined to be dry by the Airport Operator.*

**k.** Runway Condition codes “X/X/X.” When a FICON NOTAM indicates these values, the statement “Runway Condition Codes Missing” must be included on the ATIS broadcast.

**EXAMPLE–**

*“Runway (number) condition codes missing at one three four seven Zulu.”*

**NOTE–**

*A FICON NOTAM may be generated with “X/X/X” instead of Runway Condition Codes. This will occur when the NOTAM user interface is not functioning correctly; however, a FICON NOTAM is still present.*

**l.** Other optional information as local conditions dictate in coordination with ATC. This may include such items as VFR arrival frequencies, temporary airport conditions, LAHSO operations being conducted, or other perishable items that may appear only for a matter of hours or a few days on the ATIS message.

**m.** When all 3 runway segments (touchdown, midpoint, and rollout) are reporting a code of 6, the Airport Operator will notify ATC that runway condition codes are no longer reportable.

**n.** Low level wind shear/microburst when reported by pilots or is detected on a wind shear detection system.

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–1–8, Low Level Wind Shear/Microburst Advisories.*

**o.** A statement which advises the pilot to read back instructions to hold short of a runway. The air traffic manager may elect to remove this requirement 60 days after implementation provided that removing the statement from the ATIS does not result in

increased requests from aircraft for read back of hold short instructions.

**p.** Instructions for the pilot to acknowledge receipt of the ATIS message by informing the controller on initial contact.

**EXAMPLE–**

*“Boston Tower Information Delta. One four zero zero Zulu. Wind two five zero at one zero. Visibility one zero. Ceiling four thousand five hundred broken. Temperature three four. Dew point two eight. Altimeter three zero one zero. ILS–DME Runway Two Seven Approach in use. Departing Runway Two Two Right. Hazardous Weather Information for (geographical area) available on Flight Service Frequencies. Advise on initial contact you have Delta.”* ■

(2) The aircrew has executed an alternate clearance or requested further instructions.

**NOTE–**

*When the escape procedure is complete, the flight crew must advise ATC they are returning to their previously assigned clearance or request further instructions.*

**EXAMPLE–**

*“Denver Tower, United 1154, wind shear escape complete, resuming last assigned heading/(name) DP/clearance.”*

Or

*“Denver Tower, United 1154, wind shear escape complete, request further instructions.”*

### 3–1–9. USE OF TOWER RADAR DISPLAYS

a. Uncertified tower display workstations must be used only as an aid to assist controllers in visually locating aircraft or in determining their spatial relationship to known geographical points. Radar services and traffic advisories are not to be provided using uncertified tower display workstations. General information may be given in an easy to understand manner, such as “to your right” or “ahead of you.”

**EXAMPLE–**

*“Follow the aircraft ahead of you passing the river at the stacks.” “King Air passing left to right.”*

**REFERENCE–**

FAA Order JO 7210.3, Para 10–5–3, Functional Use of Certified Tower Radar Displays.

b. Local controllers may use certified tower radar displays for the following purposes:

1. To determine an aircraft’s identification, exact location, or spatial relationship to other aircraft.

**NOTE–**

*This authorization does not alter visual separation procedures. When employing visual separation, the provisions of Para 7–2–1, Visual Separation, apply unless otherwise authorized by the Service Area Director of Air Traffic Operations.*

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–2, Primary Radar Identification Methods.  
FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.  
FAA Order JO 7110.65, Para 5–3–4, Terminal Automation Systems Identification Methods.

2. To provide aircraft with radar traffic advisories.

3. To provide a direction or suggested headings to VFR aircraft as a method for radar identification or as an advisory aid to navigation.

**PHRASEOLOGY–**

*(Identification), PROCEED (direction)–BOUND, (other instructions or information as necessary),*

or

*(identification), SUGGESTED HEADING (degrees), (other instructions as necessary).*

**NOTE–**

*It is important that the pilot be aware of the fact that the directions or headings being provided are suggestions or are advisory in nature. This is to keep the pilot from being inadvertently misled into assuming that radar vectors (and other associated radar services) are being provided when, in fact, they are not.*

4. To provide information and instructions to aircraft operating within the surface area for which the tower has responsibility.

**EXAMPLE–**

*“TURN BASE LEG NOW.”*

**NOTE–**

*Unless otherwise authorized, tower radar displays are intended to be an aid to local controllers in meeting their responsibilities to the aircraft operating on the runways or within the surface area. They are not intended to provide radar benefits to pilots except for those accrued through a more efficient and effective local control position. In addition, local controllers at nonapproach control towers must devote the majority of their time to visually scanning the runways and local area; an assurance of continued positive radar identification could place distracting and operationally inefficient requirements upon the local controller. Therefore, since the requirements of Para 5–3–1, Application, cannot be assured, the radar functions prescribed above are not considered to be radar services and pilots should not be advised of being in “radar contact.”*

c. Additional functions may be performed provided the procedures have been reviewed and authorized by appropriate management levels.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–5–4, Minima.

### 3–1–10. OBSERVED ABNORMALITIES

When requested by a pilot or when you deem it necessary, inform an aircraft of any observed abnormal aircraft condition.

**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. SURFACE AREA RESTRICTIONS**

**a.** If traffic conditions permit, approve a pilot’s request to cross Class C or Class D surface areas or exceed the Class C or Class D airspace speed limit. Do not, however, approve a speed in excess of 250 knots (288 mph) unless the pilot informs you a higher minimum speed is required.

**NOTE–**

*14 CFR Section 91.117 permits speeds in excess of 250 knots (288 mph) when so required or recommended in the airplane flight manual or required by normal military operating procedures.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 2–1–16, Surface Areas.*

**b.** Do not approve a pilot’s request or ask a pilot to conduct unusual maneuvers within surface areas of Class B, C, or D airspace if they are not essential to the performance of the flight.

**EXCEPTION.** A pilot’s request to conduct aerobatic practice activities may be approved, when operating in accordance with a letter of agreement, 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.

**REFERENCE–**

*FAA Order JO 7210.3, Para 5–4–8, Aerobatic Practice Areas.*

**NOTE–**

*These unusual maneuvers include unnecessary low passes, unscheduled flybys, practice instrument approaches to altitudes 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 altitude and/or a high rate of speed for thrill purposes. Such maneuvers increase hazards to persons and property and contribute to noise complaints.*

**3–1–12. VISUALLY SCANNING RUNWAYS**

**a.** Local controllers must visually scan runways to the maximum extent possible.

**b.** Ground control must assist local control in visually scanning runways, especially when runways are in close proximity to other movement areas.

**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–**

*(A/c call sign) REMAIN OUTSIDE DELTA AIRSPACE AND STANDBY.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 7–2–1, Visual Separation.*

**3–1–14. GROUND OPERATIONS WHEN VOLCANIC ASH IS PRESENT**

When volcanic ash is present on the airport surface, and to the extent possible:

**a.** Avoid requiring aircraft to come to a full stop while taxiing.

**b.** Provide for a rolling takeoff for all departures.

**NOTE–**

*When aircraft begin a taxi or takeoff roll on ash contaminated surfaces, large amounts of volcanic ash will again become airborne. This newly airborne ash will significantly reduce visibility and will be ingested by the engines of following aircraft.*

**REFERENCE–**

*AIM, Para 7–5–9, Flight Operations in Volcanic Ash.*

**3–1–15. GROUND OPERATIONS RELATED TO THREE/FOUR-HOUR TARMAC RULE**

When a request is made by the pilot-in-command of an aircraft to return to the ramp, gate, or alternate deplaning area due to the Three/Four-Hour Tarmac Rule:

**a.** Provide the requested services as soon as operationally practical, or

**b.** Advise the pilot-in-command that the requested service cannot be accommodated because it would create a significant disruption to air traffic operations.

- b. As requested by the pilot.
- c. As you deem necessary, if not contrary to pilot's request.

**TBL 3-4-6****Two Step MALS/One Step RAIL/Two Step ODALS**

Settings		Visibility	
		Day	Night
MALS/ODALS RAIL	Hi On	Less than 3 miles	Less than 3 miles
MALS/ODALS RAIL	Low Off	When requested	3 miles or more
*At locations providing part-time control tower service, if duplicate controls are not provided in the associated FSS, the MALSR/ODALS must be set to low intensity during the hours of darkness when the tower is not staffed.			

**TBL 3-4-7****Three Step MALS/Three Step RAIL/  
Three Step ODALS**

Settings	Visibility	
	Day	Night
3	Less than 2 miles	Less than 1 mile
2	2 to 5 miles inclusive	1 to but not including 3 miles*
1	When requested	3 miles or more
*At locations providing part-time control tower service, if duplicate controls are not provided in the FSS on the airport, the air-to-ground radio link shall be activated during the hours of darkness when the tower is unmanned. If there is no radio air-to-ground control, the MALSR/ODALS shall be set on intensity setting 2 during the hours of darkness when the tower is not staffed.		

**REFERENCE—**

FAA Order JO 7210.3, Para 10-6-2, *Operation of Lights When Tower is Closed.*

**3-4-9. ALSF-2/SSALR**

a. When the prevailing visibility is  $\frac{3}{4}$  mile or less or the RVR is 4,000 feet or less, operate the ALSF-2 system as follows:

1. As requested by the pilot.
  2. As you deem necessary if not contrary to pilot request.
- b. Operate the SSALR system when the conditions in subpara a are not a factor.

**3-4-10. 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 taxis onto the runway and until it leaves the Class B, Class C, or Class D surface area.

2. For arrivals:

- (a) IFR aircraft—Before the aircraft begins final approach, or

- (b) VFR aircraft—Before the aircraft enters the Class B, Class C, or Class D surface area, and

- (c) Until the aircraft has taxied off the landing runway.

- b. Between sunrise and sunset, turn the lights on as shown in subparas a1 and a2 when the surface visibility is less than 2 miles.

- c. As required by facility 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, 14 CFR Part 135 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.*

**REFERENCE—**

FAA Order JO 7210.3, Para 10-6-3, *Incompatible Light System Operation.*

FAA Order JO 7210.3, Para 10-6-9, *Runway Edge Lights Associated With Medium Approach Light System/Runway Alignment Indicator Lights.*

### 3-4-11. HIGH INTENSITY RUNWAY, RUNWAY CENTERLINE, AND TOUCHDOWN ZONE LIGHTS

Operate high intensity runway and associated runway centerline and touchdown zone lights in accordance with TBL 3-4-8, except:

- a. Where a facility directive specifies other settings to meet local conditions.
- b. As requested by the pilot.
- c. As you deem necessary, if not contrary to pilot request.

#### TBL 3-4-8 HIRL, RCLS, TDZL Intensity Setting

Step	Visibility	
	Day	Night
5	Less than 1 mile*	When requested
4	1 to but not including 2 miles*	Less than 1 mile*
3	2 to but not including 3 miles	1 to but not including 3 miles*
2	When requested	3 to 5 miles inclusive
1	When requested	More than 5 miles

\*and/or appropriate RVR equivalent.

### 3-4-12. HIRL ASSOCIATED WITH MALSR

Operate HIRL which control the associated MALSR in accordance with TBL 3-4-9, except:

- a. As requested by the pilot.
- b. As you deem necessary, if not contrary to the pilot's request.

#### TBL 3-4-9 HIRL Associated with MALSR

Step	Visibility	
	Day	Night
5	Less than 1 mile	When requested
4	1 to but not including 2 miles	Less than 1 mile
3	2 to but not including 3 miles	1 to but not including 3 miles
2	When requested	3 to 5 miles inclusive
1	When requested	More than 5 miles

#### 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.

#### REFERENCE-

FAA Order JO 7110.65, Para 3-4-14, Medium Intensity Runway Lights.

### 3-4-13. HIRL CHANGES AFFECTING RVR

Keep the appropriate approach controller or PAR controller informed, in advance if possible, of HIRL changes that affect RVR.

### 3-4-14. MEDIUM INTENSITY RUNWAY LIGHTS (MIRL)

Operate MIRL or MIRL which control the associated MALSR in accordance with TBL 3-4-10, except:

- a. As requested by the pilot.
- b. As you deem necessary, if not contrary to the pilot's request.

#### TBL 3-4-10 MIRL Intensity Setting

Step	Visibility	
	Day	Night
3	Less than 2 miles	Less than 1 mile
2	2 to 3 miles	1 to 3 miles
1	When requested	More than 3 miles

#### REFERENCE-

FAA Order JO 7110.65, Para 3-4-12, HIRL Associated With MALSR.

listed in the current LAHSO directive, whose Available Landing Distance (ALD) does not exceed the landing distance requirement for the runway condition.

**PHRASEOLOGY–**

**HOLD SHORT OF RUNWAY** (runway number), (traffic, type aircraft or other information).

**NOTE–**

*Pilots who prefer to use the full length of the runway or a runway different from that specified are expected to advise ATC prior to landing.*

3. Issue traffic information to both aircraft involved and obtain an acknowledgment from each. Request a read back of hold short instructions when they are not received from the pilot of the restricted aircraft.

**EXAMPLE–**

1. “Runway one eight cleared to land, hold short of runway one four left, traffic, (type aircraft) landing runway one four left.”

*(When pilot of restricted aircraft responds with only acknowledgment):*

“Runway one four left cleared to land, traffic, (type aircraft) landing runway one eight will hold short of the intersection.”

“Read back hold short instructions.”

2. “Runway three six cleared to land, hold short of runway three three, traffic, (type aircraft) departing runway three three.”

“Traffic, (type aircraft) landing runway three six will hold short of the intersection, runway three three cleared for takeoff.”

4. Issue the measured distance from the landing threshold to the hold short point rounded “down” to the nearest 50-foot increment if requested by either aircraft.

**EXAMPLE–**

“Five thousand fifty feet available.”

5. The conditions in subparas b2, 3, and 4 must be met in sufficient time for the pilots to take other action, if desired, and no later than the time landing clearance is issued.

6. Land and Hold Short runways must be free of any contamination as described in the current

LAHSO directive, with no reports that braking action is less than good.

7. There is no tailwind for the landing aircraft restricted to hold short of the intersection. The wind may be described as “calm” when appropriate.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–6–3, Reporting Weather Conditions

8. The aircraft required landing distances are listed in the current LAHSO directive.

9. STOL aircraft operations are in accordance with a letter of agreement with the aircraft operator/pilot or the pilot confirms that it is a STOL aircraft.

**WAKE TURBULENCE APPLICATION**

c. Separate aircraft landing behind a departing aircraft on a crossing runway if the arrival will fly through the airborne path of the departure by the appropriate radar separation or the following interval: (See FIG 3–10–10):

1. Heavy, large, or small behind super – 3 minutes.

2. Heavy, large, or small behind heavy – 2 minutes.

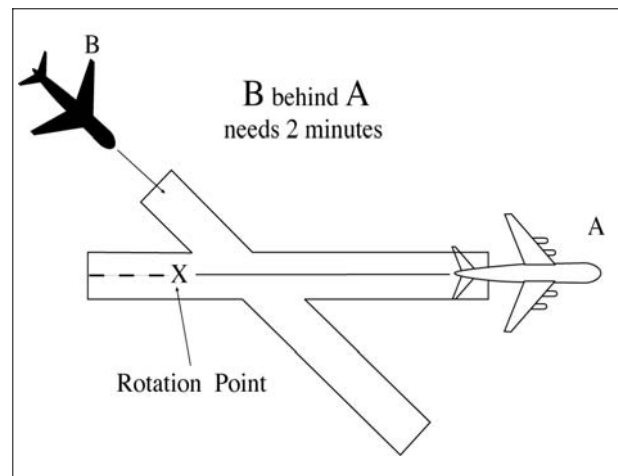
3. Small behind B757 – 2 minutes.

d. Issue wake turbulence cautionary advisories, the position, altitude if known, and direction of flight of the super, heavy, or B757 to:

**REFERENCE–**

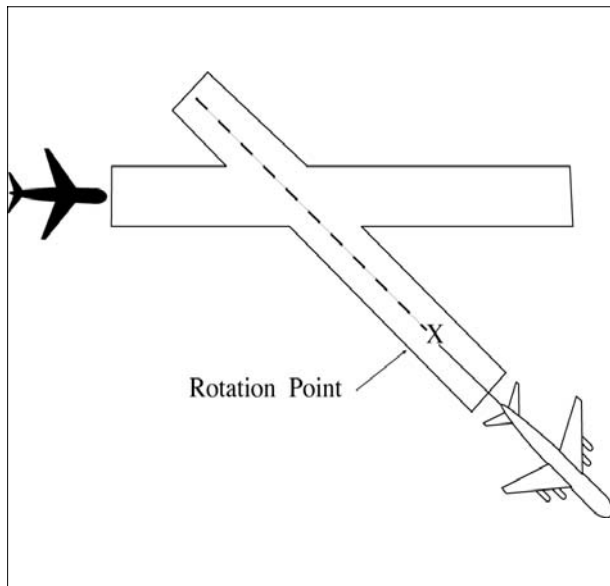
AC 90–23, Aircraft Wake Turbulence, Para 11, Pilot Responsibility.

**FIG 3–10–10**  
**Intersecting Runway Separation**



1. All aircraft landing on a crossing runway behind a departing super or heavy, or a small aircraft landing on a crossing runway behind a departing B757, if the arrival flight path will cross the takeoff path behind the departing aircraft rotation point. (See FIG 3-10-11.)

**FIG 3-10-11**  
**Intersecting Runway Separation**

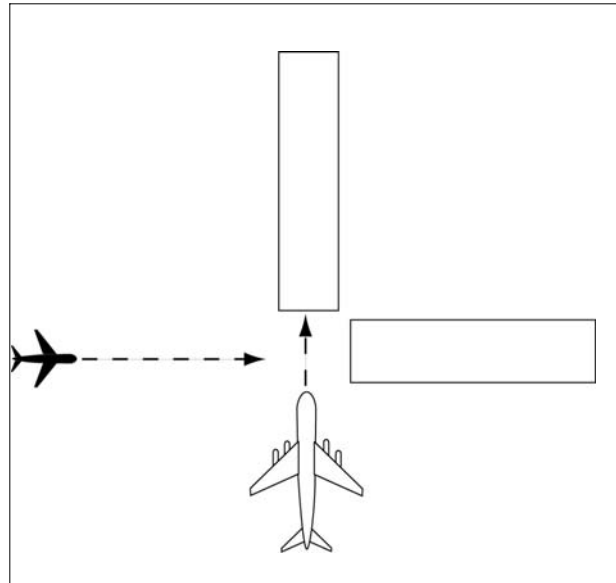


**EXAMPLE-**

*“Runway niner cleared to land. Caution wake turbulence, heavy C-One Forty One departing runway one five.”*

2. All VFR aircraft landing on a crossing runway behind an arriving super or heavy, and VFR small aircraft landing on a crossing runway behind a B757, if the arrival flight paths will cross. (See FIG 3-10-12.)

**FIG 3-10-12**  
**Intersecting Runway Separation**



**EXAMPLE-**

*“Runway niner cleared to land. Caution wake turbulence, Boeing Seven Fifty Seven landing runway three six.”*

**REFERENCE-**

FAA Order JO 7110.65, Para 7-4-4, Approaches to Multiple Runways.

### 3-10-5. LANDING CLEARANCE

a. When issuing a clearance to land, first state the runway number followed by the landing clearance. If the landing runway is changed, controllers must preface the landing clearance with “Change to runway” followed by the runway number. Controllers must then restate the runway number followed by the landing clearance.

**PHRASEOLOGY-**

*RUNWAY (number) CLEARED TO LAND.*

*Or*

*CHANGE TO RUNWAY (number, RUNWAY (number) CLEARED TO LAND.*

**NOTE-**

*The purpose of the “change to runway” phraseology and restating the runway number is to emphasize to the pilot that they are being cleared to land on a runway other than what they were expecting.*

b. When you become aware that an aircraft is aligned with the wrong surface, inform the pilot and:

1. Issue control instructions/clearances, or

**EXAMPLE–**

*“United four twenty three, go-around, you appear to be aligned with the wrong runway.”*

*“American sixty three, go-around, you appear to be aligned with a taxiway.”*

*“Southwest two thirty nine, you appear to be aligned with Runway 27 Left (pertinent information), Runway 27 Left, cleared to land.”*

2. If time permits, verify the pilot is aligned with the correct runway. Issue control instructions/clearances as necessary.

**EXAMPLE–**

*“Twin Cessna four one four lima bravo, verify you are aligned with Runway 27 Left.”*

**REFERENCE–**

FAA Order JO 7110.65, Para 3–6–4, Safety Logic Alert Responses.  
FAA Order JO 7110.65, Para 3–10–8, Withholding Landing Clearance.

**c. Procedures.**

1. Facilities without a safety logic system or facilities with the safety logic system inoperative or in the limited configuration must not clear an aircraft for a full-stop, touch-and-go, stop-and-go, option, or unrestricted low approach when a departing aircraft has been instructed to line up and wait or is holding in position on the same runway. The landing clearance may be issued once the aircraft in position has started takeoff roll.

2. Facilities using safety logic in the full core alert runway configuration may issue a landing clearance, full-stop, touch-and-go, stop-and-go, option, or unrestricted low approach to an arriving aircraft with an aircraft holding in position or taxiing to LUAW on the same runway except when reported weather conditions are less than ceiling 800 feet or visibility less than 2 miles.

d. Inform the closest aircraft that is requesting a full-stop, touch-and-go, stop-and-go, option, or unrestricted low approaches when there is traffic authorized to line up and wait on the same runway.

**EXAMPLE–**

*“Delta One, Runway One-Eight, continue, traffic holding in position.”*

*“Delta One, Runway One-Eight, cleared to land. Traffic holding in position.”*

*“Twin Cessna Four Four Golf, Runway One-Niner base approved, traffic holding in position.”*

*“Baron Two Five Foxtrot, Runway One-Niner Right extend downwind, tower will call your base, traffic holding in position.”*

e. USA/USN/USAF. Issue runway identifier along with surface wind when clearing an aircraft to land, touch and go, stop and go, low approach, or the option.

**PHRASEOLOGY–**

*RUNWAY (number), WIND (surface wind direction and velocity), 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.*

f. 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 Chart Supplement U.S. 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.”*

g. 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.”*

**REFERENCE–**

FAA Order JO 7210.3, Para 10-3-12, Airport Construction  
 FAA Order JO 7210.3, Para 10-3-13, Change in Runway Length Due to Construction

**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.

**EXAMPLE–**

*“American Two Forty-Five, Runway One-Eight, cleared to land, number two following a United Seven-Thirty-Seven two mile final. Traffic will depart prior to your arrival.”*

*“American Two Forty-Five, Runway One-Eight, cleared to land. Traffic will depart prior to your arrival.”*

**NOTE–**

*Landing sequence number is optional at tower facilities where the arrival sequence to the runway is established by the approach control.*

**b.** Anticipating separation must not be applied when conducting LUAW operations, except as authorized in paragraph 3-10-5c2. Issue applicable traffic information when using this provision.

**EXAMPLE–**

*“American Two Forty-Five, Runway One-Eight, cleared to land. Traffic will be a Boeing Seven-Fifty-Seven holding in position.”*

**REFERENCE–**

*P/CG Term– Clear of the Runway.*

**3-10-7. LANDING CLEARANCE WITHOUT VISUAL OBSERVATION**

When an arriving aircraft reports at a position where he/she 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 CTRD 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 Title 14 of the Code of Federal Regulations 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.** 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.*

**b.** Taxi instructions must be provided to the aircraft by the local 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 an active runway in order to taxi clear of the landing runway.

**EXAMPLE–**

*“U.S. Air Ten Forty Two, turn right next taxiway, cross runway two one, contact ground point seven.”*

*“U.S. Air Ten Forty Two, turn right on Alfa/next taxiway, cross Bravo, hold short of Charlie, contact ground point seven.”*

**NOTE–**

**1.** An aircraft is expected to taxi clear of the runway unless otherwise directed by ATC. Pilots must not exit the landing runway on to an intersecting runway unless authorized by ATC. In the absence of ATC instructions, an aircraft should taxi clear of the landing runway by clearing the hold position marking associated with the landing runway even if that requires the aircraft to protrude into or enter another

taxiway/ramp area. This does not authorize an aircraft to cross a subsequent taxiway or ramp after clearing the landing runway.

**REFERENCE–**

*P/CG Term– Clear of the Runway.*

2. The pilot is responsible for ascertaining when the aircraft is clear of the runway by clearing the runway holding position marking associated with the landing runway.

c. Ground control and local control must protect a taxiway/runway/ramp intersection if an aircraft is required to enter that intersection to clear the landing runway.

**REFERENCE–**

*FAA Order JO 7210.3, Para 10–1–7, Use of Active Runways.*

d. Request a read back of runway hold short instructions when not received from the pilot.

**EXAMPLE–**

*“American Four Ninety–two, turn left at Taxiway Charlie, hold short of Runway 27 Right.”*

*or*

*“American Four Ninety–two, turn left at Charlie, hold short of Runway 27 Right.”*

*“American Four Ninety Two, Roger.”*

*“American Four Ninety–two, read back hold instructions.”*

**NOTE–**

*Read back hold instructions phraseology may be initiated for any point on a movement area when the controller believes the read back is necessary.*

### 3–10–10. ALTITUDE RESTRICTED LOW APPROACH

A low approach with an altitude restriction of not less than 500 feet above the airport may be authorized except over an aircraft in takeoff position or a departure aircraft. Do not clear aircraft for restricted altitude low approaches over personnel unless airport 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 altitudes should be used when warranted. For example, 1,000 feet is more appropriate for super or heavy aircraft operating

over unprotected personnel or small aircraft on or near the runway.

2. This authorization includes altitude restricted low approaches over preceding landing or taxiing aircraft. Restricted low approaches are not authorized over aircraft in takeoff position or departing aircraft.

**PHRASEOLOGY–**

*CLEARED LOW APPROACH AT OR ABOVE (altitude). TRAFFIC (description and location).*

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–1–5, Vehicles/Equipment/Personnel on Runways.*

*FAA Order JO 7110.65, Para 3–1–6, Traffic Information.*

*FAA Order JO 7110.65, Para 3–2–1, Light Signals.*

*FAA Order JO 7110.65, Para 3–3–3, Timely Information.*

*FAA Order JO 7110.65, Para 3–9–4, Line Up and Wait (LUAW).*

*FAA Order JO 7110.65, Para 3–10–3, Same Runway Separation.*

### 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 patterns for helicopters to runways and other areas may be established by letter of agreement or other local operating procedures.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–7–4, Runway Proximity.*

*FAA Order JO 7110.65, Para 3–9–4, Line Up and Wait (LUAW).*

*FAA Order JO 7110.65, Para 3–10–3, Same Runway Separation.*

### 3–10–12. OVERHEAD MANEUVER

Issue the following to arriving aircraft that will conduct an overhead maneuver:

a. Pattern altitude and direction of traffic. Omit either or both if standard or when you know the pilot is familiar with a nonstandard procedure.

**PHRASEOLOGY–**

*PATTERN ALTITUDE (altitude). 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*).

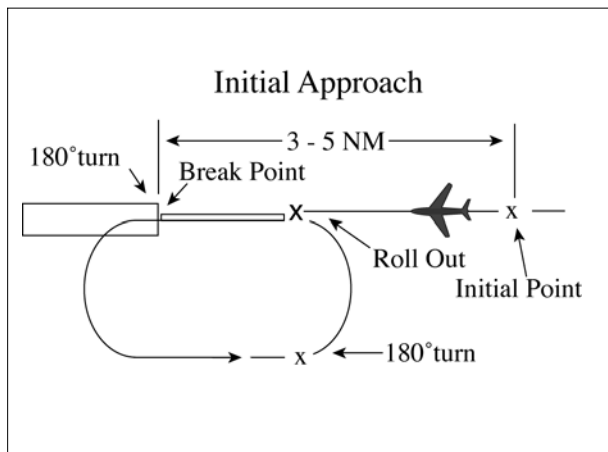
**REPORT BREAK.**

d. Overhead maneuver patterns are developed at airports where aircraft have an operational need to conduct the maneuver. An aircraft conducting an overhead maneuver is VFR and the IFR flight plan is canceled 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.

**NOTE–**

*Aircraft operating to an airport without a functioning control tower must initiate cancellation of the IFR flight plan prior to executing the overhead maneuver or after landing.*

**FIG 3–10–13  
Overhead Maneuver**



**EXAMPLE–**

*“Air Force Three Six Eight, Runway Six, wind zero seven zero at eight, pattern altitude six thousand, report initial.”*

*“Air Force Three Six Eight, break at midfield, report break.”*

*“Air Force Three Six Eight, cleared to land.”*

*“Alfa Kilo Two Two, Runway Three One, wind three three*

*zero at one four, right turns, report initial.”*

*“Alfa Kilo Two Two, report break.”*

*“Alfa Kilo Two Two, cleared to land.”*

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, facility directive, base flying manual etc., when the frequency of occurrence warrants.

**3–10–13. SIMULATED FLAMEOUT (SFO) APPROACHES/EMERGENCY LANDING PATTERN (ELP) OPERATIONS/PRACTICE PRECAUTIONARY APPROACHES**

a. Authorize military aircraft to make SFO/ELP/practice precautionary approaches if the following conditions are met:

1. A letter of agreement or local operating procedure is in effect between the military flying organization and affected ATC facility.

(a) Include specific coordination, execution, and approval procedures for the operation.

(b) The exchange or issuance of traffic information as agreed to in any interfacility letter of agreement is accomplished.

(c) Include a statement in the procedure that clarifies at which points SFOs/ELPs may/may not be terminated. (See FIG 3–10–14 and FIG 3–10–16.)

2. 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/ELP aircraft and other concerned aircraft.

3. The high-key altitude or practice precautionary approach maneuvering altitudes of the aircraft concerned are obtained prior to approving the approach. (See FIG 3–10–14 and FIG 3–10–16.)

**NOTE–**

1. Practice precautionary/SFO/ELP approaches are authorized only for specific aircraft. Any aircraft, however, might make precautionary approaches, when engine failure is considered possible. The practice precautionary approach maneuvering area/altitudes may not conform to the standard SFO/ELP maneuvering area/altitudes.

**2.** *SFO/ELP approaches generally require high descent rates. Visibility ahead and beneath the aircraft is greatly restricted.*

**3.** *Pattern adjustments for aircraft conducting SFOs and ELPs may impact the effectiveness of SFO and ELP training.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 4–8–12, Low Approach and Touch-and-Go.*

*FAA Order JO 7610.4, Para 9–3–7, Simulated Flameout (SFO)/Emergency Landing Pattern (ELP) Operations.*

**b.** For overhead SFO/ELP 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.

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–8–1, Sequence/Spacing Application.*

*FAA Order JO 7110.65, Para 10–1–7, Inflight Emergencies Involving Military Fighter-type Aircraft.*

*FAA Order JO 7610.4, Para 9–3–7, Simulated Flameout (SFO)/Emergency Landing Pattern (ELP) Operations.*

**c.** For straight-in simulation flameout approaches:

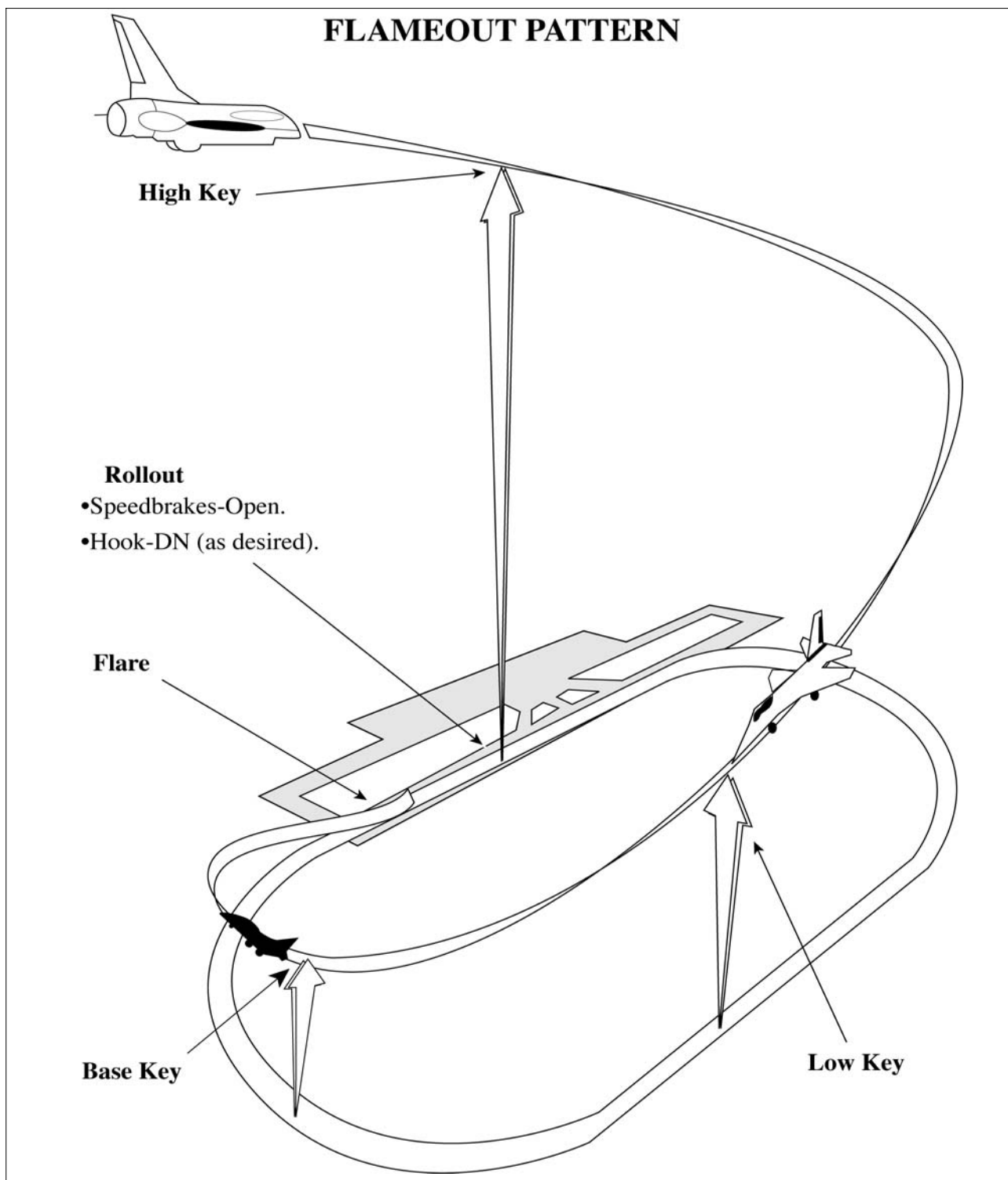
**1.** Request a position report from aircraft conducting straight-in SFO approaches.

**PHRASEOLOGY–**

*REPORT (distance) MILE 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 3–10–15.)

**FIG 3-10-14**  
**Simulated Flameout [1]**



## High Key

## Rollout

- Speedbrakes-Open.
- Hook-DN (as desired).

## Flare

### Base Key

## Low Key

## Chapter 4. IFR

### Section 1. NAVAID Use Limitations

#### 4-1-1. ALTITUDE 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 altitude and distance limitations, see TBL 4-1-1, TBL 4-1-2, and TBL 4-1-3) (For correct application of altitude and distance limitations see FIG 4-1-1 and FIG 4-1-2.)

##### REFERENCE-

FAA Order JO 7110.65, Para 4-1-5, Fix Use.

FAA Order JO 7110.65, Para 5-6-2, Methods.

**TBL 4-1-1**

#### **VOR/VORTAC/TACAN NAVAIDS**

Normal Usable Altitudes and Radius Distances

Class	Altitude	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 – FL 450	130
H	Above FL 450	100

**TBL 4-1-2**

#### **L/MF Radio Beacon (RBN)**

Usable Radius Distances for All Altitudes

Class	Power (watts)	Distance (miles)
CL	Under 25	15
MH	Under 50	25
H	50 – 1,999	50
HH	2,000 or more	75

**TBL 4-1-3**

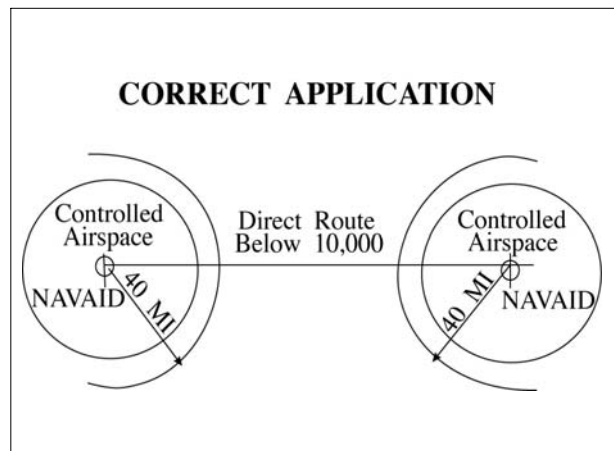
#### **ILS**

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/altitude limitations if different from the above minima.	

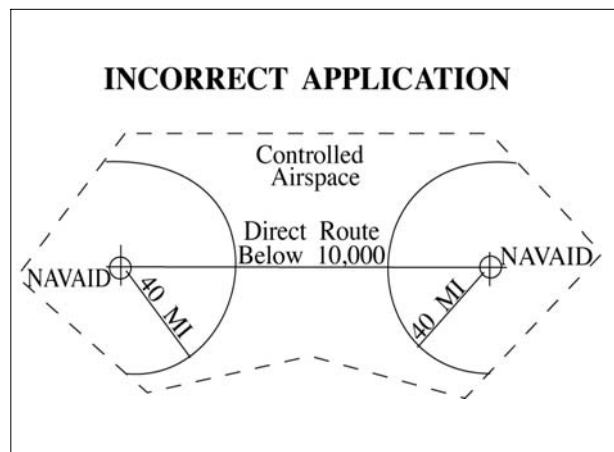
**FIG 4-1-1**

#### **Application of Altitude and Distance Limitations [Application 1]**



**FIG 4-1-2**

#### **Application of Altitude and Distance Limitations [Application 2]**



#### 4-1-2. EXCEPTIONS

Altitude and distance limitations need not be applied when any of the following conditions are met:

- Routing is initiated by ATC or requested by the pilot and radar monitoring is provided.

##### EXCEPTION-

GNSS equipped aircraft /G, /L, /S, and /V not on a random impromptu route.

**NOTE—**

1. Except for GNSS-equipped aircraft /G, /L, /S, and /V, not on a random impromptu route, Paragraph 5-5-1, Application, requires radar separation be provided to RNAV aircraft operating at and below FL450 on Q routes or random RNAV routes, excluding oceanic airspace.

2. When a clearance is issued beyond the altitude 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.

**REFERENCE—**

FAA Order JO 7110.65, Para 2-1-3, Procedural Preference.  
 FAA Order JO 7110.65, Para 4-4-2, Route Structure Transitions.  
 FAA Order JO 7110.65, Para 5-1-10, Deviation Advisories.  
 FAA Order JO 7110.65, Para 5-5-1, Application.  
 FAA Order JO 7110.65, Para 6-5-4, Minima Along Other Than Established Airways or Routes.  
 AIM, Para 5-1-8c, Direct Flights  
 AIM, Para 5-1-8d, Area Navigation (RNAV)  
 P/CG Term - Global Navigation Satellite System (GNSS)/[ICAO].

b. Operational necessity requires and approval has been obtained from the Frequency Management and Flight Inspection Offices to exceed them.

c. Requested routing is via an MTR.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-6-2, Methods.

**4-1-3. CROSSING ALTITUDE**

Use an altitude consistent with the limitations of the aid when clearing an aircraft to cross or hold at a fix.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-6-2, Methods.

**4-1-4. VFR-ON-TOP**

Use a route not meeting service volume limitations only if an aircraft requests to operate “VFR-on-top” on this route.

**NOTE—**

Aircraft equipped with TACAN only are expected to:

1. Define route of flight between TACAN or VORTAC NAVAIDs in the same manner as VOR-equipped aircraft.

2. Except in Class A airspace, submit requests for “VFR-on-top” flight where insufficient TACAN or VORTAC NAVAIDs exist to define the route.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-6-2, Methods.

**4-1-5. FIX USE**

Request aircraft position reports only over fixes shown on charts used for the altitude being flown, 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 high altitude en route charts, high altitude 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/course/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:

**REFERENCE—**

FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), Chapter 17, Basic Holding Criteria..

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 must 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 altitude 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—**

FAA Order JO 7110.65, Para 4-1-1, Altitude and Distance Limitations.

3. Do not hold aircraft at unpublished fixes below the lowest assignable altitude 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 course

*five thousand.”*

*“Astoria Two Departure, except cross Astor waypoint at six thousand.”*

(c) Specify altitudes when they are not included in the SID.

**PHRASEOLOGY–**

*(SID name and number) DEPARTURE. CROSS (fix) AT (altitude).*

**EXAMPLE–**

*“Stroudsburg One Departure. Cross Jersey intersection at four thousand. Cross Range intersection at six thousand.”*

*“Engle Two departure. Cross Pilim waypoint at or above five thousand. Cross Engle waypoint at or above seven thousand. Cross Gorge waypoint at niner thousand.”*

d. Route of flight. Specify one or more of the following:

1. Airway, route, course, 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.)*

e. Altitude. Use one of the following in the order of preference listed.

**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/her traffic to accommodate the high performance climb and allow the pilot to climb to his/her planned altitude without restriction.*

**REFERENCE–**

■ *P/CG, Climb Via, Top Altitude*

1. To the maximum extent possible, Air Force One will be cleared unrestricted climb to:

(a) 9,000' AGL or higher.

(b) If unable 9,000' AGL or higher, then the highest available altitude below 9,000' AGL.

2. Assign the altitude requested by the pilot.

3. Assign an altitude, as near as possible to the altitude requested by the pilot, and

(a) Inform the pilot when to expect clearance to the requested altitude unless instructions are contained in the specified SID, or

(b) If the requested altitude is not expected to be available, inform the pilot what altitude can be expected and when/where to expect it.

4. Use one of the following when the SID contains published crossing restrictions:

(a) Instruct aircraft to “Climb via SID.”

(b) Instruct the aircraft to “Climb via SID except maintain (altitude)” when a top altitude is not published or when it is necessary to issue an interim altitude.

**EXAMPLE–**

*“Cleared to Johnston Airport, Scott One departure, Jonez transition, Q One Forty-five. Climb via SID.”*

*“Cleared to Johnston Airport, Scott One departure, Jonez transition, Q One Forty-five, Climb via SID except maintain flight level one eight zero.”*

*“Cleared to Johnston Airport, Scott One departure, Jonez transition, Q One Forty-five, Climb Via SID except maintain flight level one eight zero, expect flight level three five zero one zero minutes after departure.”*

**NOTE–**

1. Use of “Climb via SID Except Maintain” to emphasize a published procedural constraint is an inappropriate use of this phraseology.

2. Considering the principle that the last ATC clearance issued has precedence over the previous, the phraseology “maintain (altitude)” alone cancels previously issued altitude restrictions, including SID/STAR altitude restrictions, unless they are restated or modified.

**REFERENCE–**

*FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments  
AIM 4–4–10 Adherence to Clearance.*

5. When a SID does not contain published crossing restrictions and/or is a SID with a Radar Vector segment or a Radar Vector SID; or a SID is constructed with a Radar Vector segment and contains published crossing restrictions after the vector segment, instruct aircraft to “MAINTAIN (altitude).”

**NOTE–**

1. 14 CFR Section 91.185, says that in the event of a two-way radio communication failure, in VFR conditions or if VFR conditions are encountered after the failure, the pilot must continue the flight under VFR and land as soon as practicable. That section also says that when the failure occurs in IFR conditions the pilot must continue flight at

the highest of the following altitudes or flight levels for the route segment being flown:

a. The altitude or flight level assigned in the last ATC clearance received.

b. The minimum altitude (converted, if appropriate, to minimum flight level as prescribed in 14 CFR Section 91.121(c)) for IFR operations. (This altitude should be consistent with MEAs, MOCAs, etc.)

c. The altitude or flight level ATC has advised may be expected in a further clearance.

2. If the expected altitude is the highest of the preceding choices, the pilot should begin to climb to that expected altitude at the time or fix specified in the clearance. The choice to climb to the expected altitude is not applicable if the pilot has proceeded beyond the specified fix or if the time designated in the clearance has expired.

#### **PHRASEOLOGY—**

CLIMB AND MAINTAIN (the altitude as near as possible to the pilot's requested altitude). EXPECT (the requested altitude or an altitude different from the requested altitude) AT (time or fix),

and if applicable,

(pilot's requested altitude) IS NOT AVAILABLE.

#### **EXAMPLE—**

1. A pilot has requested flight level 350. Flight level 230 is immediately available and flight level 350 will be available at the Appleton zero five zero radial 35 mile fix. The clearance will read:

"Climb and maintain flight level two three zero. Expect flight level three five zero at Appleton zero five zero radial three five mile fix."

2. A pilot has requested 9,000 feet. An altitude restriction is required because of facility procedures or requirements. Assign the altitude and advise the pilot at what fix/time the pilot may expect the requested altitude. The clearance could read:

"Climb and maintain five thousand. Expect nine thousand one zero minutes after departure."

3. A pilot has requested 17,000 feet which is unavailable. You plan 15,000 feet to be the pilot's highest altitude prior to descent to the pilot's destination but only 13,000 feet is available until San Jose VOR. Advise the pilot of the expected altitude change and at what fix/time to expect clearance to 15,000 feet. The clearance will read: "Climb and maintain one three thousand. Expect one five thousand at San Jose. One seven thousand is not available."

#### **REFERENCE—**

FAA Order JO 7110.65, Para 4-3-3, Abbreviated Departure Clearance.

FAA Order JO 7110.65, Para 5-8-2, Initial Heading.

FAA Order JO 7110.65 Para 4-2-5 Route or Altitude Amendments.

AIM 4-4-10 Adherence to Clearance.

### **4-3-3. ABBREVIATED DEPARTURE CLEARANCE**

a. Issue an abbreviated departure clearance if its use reduces verbiage and the following conditions are met:

#### **REFERENCE—**

FAA Order JO 7110.65, Para 4-2-8, IFR-VFR and VFR-IFR Flights.

1. The route of flight filed with ATC has not been changed by the pilot, company, operations officer, input operator, or in the stored flight plan program prior to departure.

#### **NOTE—**

A pilot will not accept an abbreviated clearance if the route of flight filed with ATC has been changed by him/her or the company or the operations officer before departure. He/she is expected to inform the control facility on initial radio contact if he/she cannot accept the clearance. It is the responsibility of the company or operations officer to inform the pilot when they make a change.

2. All ATC facilities concerned have sufficient route of flight information to exercise their control responsibilities.

#### **NOTE—**

The route of flight information to be provided may be covered in letters of agreement.

3. When the flight will depart IFR, destination airport information is relayed between the facilities concerned prior to departure.

#### **EXAMPLE—**

1. A tower or flight service station relay of destination airport information to the center when requesting clearance:

"Request clearance for United Four Sixty-One to O'Hare."

2. A center relay to the tower or flight service station when initiating a clearance:

"Clearance for United Four Sixty-One to O'Hare."

#### **NOTE—**

Pilots are expected to furnish the facility concerned with destination airport information on initial radio call-up. This will provide the information necessary for detecting any destination airport differences on facility relay.

4. The assigned altitude, according to the provisions in Para 4-3-2, Departure Clearances, subparagraph e, is stated in the clearance.

b. If it is necessary to modify a filed route of flight in order to achieve computer acceptance due, for example, to incorrect fix or airway identification, the contraction "FRC," meaning "Full Route Clearance

Necessary,” or “FRC/(fix),” will be added to the remarks. “FRC” or “FRC/(fix)” must always be the first item of intra-center remarks. When “FRC” or “FRC/(fix)” appears on a flight progress strip, the controller issuing the ATC clearance to the aircraft must issue a full route clearance to the specified fix, or, if no fix is specified, for the entire route.

**EXAMPLE–**

*“Cleared to Missoula International Airport, Chief Two Departure to Angley; direct Salina; then as filed; maintain one seven thousand.”*

**NOTE–**

*Changes, such as those made to conform with traffic flows and preferred routings, are only permitted to be made by the pilot (or his/her operations office) or the controller responsible for initiating the clearance to the aircraft.*

- c. Specify the destination airport in the clearance.
- d. When no changes are required in the filed route, state the phrase: “Cleared to (destination) airport, ([SID name and number] and SID transition, as appropriate); then, as filed.” If a SID is not assigned, follow with “As filed.” If required, add any additional instructions or information, including requested altitude if different than assigned.
- e. Use one of the following when the SID contains published crossing restrictions:

- 1. Instruct aircraft to “Climb via SID.”
- 2. Instruct aircraft to “Climb via SID except maintain (altitude)” when a top altitude is not published or when it is necessary to issue an interim altitude.

**NOTE–**

*Use of “Climb via SID Except Maintain” to emphasize a published procedural constraint is an inappropriate use of this phraseology.*

- f. Instruct aircraft to MAINTAIN (altitude) when:
  - 1. No SID is assigned.
  - 2. A SID does not contain published crossing restrictions and/or is a SID with a Radar Vector segment or is a Radar Vector SID.
  - 3. A SID is constructed with a Radar Vector segment and contains published crossing restrictions after the vector segment.

**PHRASEOLOGY–**

*CLEARED TO (destination) AIRPORT;*

*and as appropriate,*

*(SID name and number) DEPARTURE,  
THEN AS FILED.*

*When the SID does not contain published crossing restrictions and/or is a SID with a Radar Vector segment or a Radar Vector SID; or is a SID with a radar vector segment and contains published crossing restrictions after the vector segment.*

*MAINTAIN (altitude); (additional instructions or information).*

*Or when a SID contains published crossing restrictions,*

*CLIMB VIA SID.*

*CLIMB VIA SID EXCEPT MAINTAIN (altitude);  
(additional instructions or information).*

*If a SID is not assigned,*

*CLEARED TO (destination) AIRPORT AS FILED.  
MAINTAIN (altitude);*

*and if required,*

*(additional instructions or information).*

**EXAMPLE–**

*“Cleared to Reynolds Airport; David Two Departure, Kingham Transition; then, as filed. Maintain niner thousand. Expect flight level four one zero, one zero minutes after departure.”*

*“Cleared to Reynolds Airport; David Two Departure, Kingham Transition; then, as filed. Climb via SID.”*

*“Cleared to Reynolds Airport; David Two Departure, Kingham Transition; then, as filed. Climb via SID except maintain flight level two four zero. Expect flight level four one zero, one zero minutes after departure.”*

*“Cleared to Reynolds Airport as filed. Maintain niner thousand. Expect flight level four one zero, one zero minutes after departure.”*

**NOTE–**

- 1. SIDs are excluded from “cleared as filed” procedures.
- 2. If a pilot does not wish to accept an ATC clearance to fly a SID, he/she is expected to advise ATC or state “NO SID” in his/her flight plan remarks.

**REFERENCE–**

*P/CG, Climb Via, Top Altitude*

**g.** When a filed route will require revisions, the controller responsible for initiating the clearance to the aircraft must either:

**1.** Issue a FRC/FRC until a fix.

**2.** Specify the assigned altitude to maintain, or Climb Via SID, or Climb Via SID except maintain (altitude), as appropriate.

**PHRASEOLOGY–**

*CLEARED TO (destination) AIRPORT.*

*Or when the SID does not contain published crossing restrictions and/ or is a SID with a Radar Vector segment or a Radar Vector SID*

*(SID name and number) DEPARTURE,  
(transition name) TRANSITION; THEN, AS FILED,  
EXCEPT CHANGE ROUTE TO READ (amended route  
portion). MAINTAIN (altitude);*

*Or when the SID contains published crossing restrictions,*

*CLIMB VIA SID*

*CLIMB VIA SID EXCEPT MAINTAIN (altitude).  
and if required,*

*(additional instructions or information).*

*If a SID is not assigned,*

*CLEARED TO (destination) AIRPORT AS FILED,  
EXCEPT CHANGE ROUTE TO READ (amended route  
portion). MAINTAIN (altitude);*

*and if required,*

*(additional instructions or information).*

**EXAMPLE–**

*“Cleared to Reynolds Airport; South Boston One Departure; then, as filed, except change route to read South Boston Victor Twenty Greensboro. Maintain eight thousand, report leaving four thousand.”*

*“Cleared to Reynolds Airport; South Boston One Departure; then, as filed, except change route to read South Boston Victor Twenty Greensboro; climb via SID.”*

*“Cleared to Reynolds Airport; South Boston One Departure; then, as filed, except change route to read South Boston Victor Twenty Greensboro; climb via SID except*

*maintain flight level one eight zero, expect flight level three one zero one zero minutes after departure.”*

*“Cleared to Reynolds Airport as filed, except change route to read South Boston Victor Twenty Greensboro. Maintain eight thousand, report leaving four thousand.”*

*“Cleared to Reynolds Airport via Victor Ninety-one Albany, then as filed. Maintain six thousand.”*

**h.** In a nonradar environment specify one, two, or more fixes, as necessary, to identify the initial route of flight.

**1.** Specify the destination airport, when practicable, followed by the word “airport” even though it is outside controlled airspace.

**PHRASEOLOGY–**

*CLEARED TO (destination) AIRPORT*

**2.** When the clearance limit is a NAVAID, the type of NAVAID must follow the NAVAID name.

**PHRASEOLOGY–**

*CLEARED TO (NAVAID name and type)*

**3.** 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)*

**EXAMPLE–**

*The filed route of flight is from Hutchins V10 Emporia, thence V10N and V77 to St. Joseph. The clearance will read:*

*“Cleared to Watson Airport as filed via Emporia, maintain Seven Thousand.”*

**i.** Do not apply these procedures when a pilot requests a detailed clearance or to military operations conducted within ALTRV, stereo routes, operations above FL 600, and other military operations requiring special handling.

**NOTE–**

*Departure clearance procedures and phraseology for military operations within approved altitude reservations, military operations above FL 600, and other military operations requiring special handling are contained in separate procedures in this order or in a LOA, as appropriate.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 4–2–7, ALTRV Clearance.*

*FAA Order JO 7110.65, Para 9–2–15, Military Operations Above FL 600.*

#### **4-4-3. DEGREE-DISTANCE ROUTE DEFINITION FOR MILITARY OPERATIONS**

##### **EN ROUTE**

a. Do not accept a military flight plan whose route or route segments do not coincide with designated airways or jet routes or with a direct course between NAVAIDs unless it is authorized in subpara b and meets the following degree-distance route definition and procedural requirements:

1. The route or route segments must be defined in the flight plan by degree-distance fixes composed of:

- (a) A location identifier;
- (b) Azimuth in degrees magnetic; and
- (c) Distance in miles from the NAVAID used.

##### **EXAMPLE-**

*"MKE 030025."*

2. The NAVAIDs selected to define the degree-distance fixes must be those authorized for use at the altitude being flown and at a distance within the published service volume area.

3. The distance between the fixes used to define the route must not exceed:

- (a) Below FL 180- 80 miles;
- (b) FL 180 and above- 260 miles; and
- (c) For celestial navigation routes, all altitudes- 260 miles.

4. Degree-distance fixes used to define a route must be considered compulsory reporting points except that an aircraft may be authorized by ATC to omit reports when traffic conditions permit.

5. Military aircraft using degree-distance route definition procedures must conduct operations in accordance with the following:

(a) Unless prior coordination has been effected with the appropriate air traffic control facility, flight plan the departure and the arrival phases to conform with the routine flow of traffic when operating within 75 miles of the departure and the arrival airport. Use defined routes or airways or direct courses between NAVAIDs or as otherwise required to conform to the normal flow of traffic.

(b) Flight plans must be filed at least 2 hours before the estimated time of departure.

b. The following special military operations are authorized to define routes, or portions of routes, by degree-distance fixes:

1. Airborne radar navigation, radar bomb scoring (RBS), and airborne missile programming conducted by the USAF, USN, and RAF.

2. Celestial navigation conducted by the USAF, USN, and RAF.

3. Target aircraft operating in conjunction with air defense interceptors, and air defense interceptors while en route to and from assigned airspace.

4. Missions conducted above FL 450.

5. USN fighter and attack aircraft operating in positive control airspace.

6. USN/USMC aircraft, TACAN equipped, operating within the Honolulu FIR/Hawaiian airways area.

7. USAF/USN/USMC aircraft flight planned to operate on MTRs.

8. USAF Air Mobility Command (AMC) aircraft operating on approved station-keeping equipment (SKE) routes in accordance with the conditions and limitations listed in FAA Exemption No. 4371 to 14 CFR Section 91.177(a)(2) and 14 CFR Section 91.179(b)(1).

#### **4-4-4. ALTERNATIVE ROUTES**

When any part of an airway or route is unusable because of NAVAID status, clear aircraft that are not RNAV capable via one of the following alternative routes:

a. A route depicted on current U.S. Government charts/publications. Use the word "substitute" immediately preceding the alternative route in issuing the clearance.

b. A route defined by specifying NAVAID radials, courses, or azimuths.

c. A route defined as direct to or between NAVAIDs.

d. Vectors.

##### **NOTE-**

*Inform area navigation aircraft that will proceed to the NAVAID location of the NAVAID outage.*

#### **4-4-5. CLASS G AIRSPACE**

Include routes through Class G airspace only when requested by the pilot.

**NOTE–**

**1.** *Separation criteria are not applicable in Class G airspace. Traffic advisories and safety alerts are applicable within Class G airspace to aircraft that are in direct communication with ATC.*

**2.** *Flight plans filed for random RNAV routes through Class G airspace are considered a request by the pilot.*

**3.** *Flight plans containing MTR segments in/through Class G airspace are considered a request by the pilot.*

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–1, ATC Service  
P/CG, Class G Airspace  
P/CG, Uncontrolled Airspace

**4–4–6. DIRECT CLEARANCES**

**a.** Unless operational necessity dictates, do not issue a routing clearance that will take an aircraft off of its flight plan route if:

**1.** The aircraft is part of a known traffic management initiative.

**2.** The part of the route under consideration for the direct routing is within a protected segment. If a

flight routing within a protected segment is amended, coordination must be accomplished as follows:

**(a)** ATCS: with TMU.

**(b)** Terminal facility TMU: with overlying ARTCC TMU.

**(c)** ARTCC TMU (for amendments outside their facility): with ATCSCC.

**b. EN ROUTE.** Do not issue revised routing clearances that will take an aircraft off its flight plan route past the last fix in your facility's airspace, unless requested by the pilot or operational necessity dictates.

**NOTE–**

*Nothing in this paragraph must preclude a controller from issuing a routing clearance that conforms to a letter of agreement or standard operating procedure within their own facility or between facilities, is required to maintain separation or comply with traffic flow management initiatives.*

**EXAMPLE–**

*“United Four Seventeen, descend and maintain six thousand.”*

**NOTE–**

*The pilot is expected to commence descent upon receipt of the clearance and to descend at the suggested rates specified in the AIM, Para 4–4–10, Adherence to Clearance, until reaching the assigned altitude of 6,000 feet.*

**EXAMPLE–**

*“United Four Seventeen, descend at pilot’s discretion, maintain six thousand.”*

**NOTE–**

*The pilot is authorized to conduct descent within the context of the term “at pilot’s discretion” as described in the AIM.*

**EXAMPLE–**

*“United Four Seventeen cross Lakeview V–O–R at or above flight level two zero zero, descend and maintain six thousand.”*

**NOTE–**

*The pilot is authorized to conduct descent “at pilot’s discretion” until reaching Lakeview VOR. The pilot must comply with the clearance provision to cross the Lakeview VOR at or above FL 200, and after passing Lakeview VOR, the pilot is expected to descend at the rates specified in the AIM until reaching the assigned altitude of 6,000 feet.*

**EXAMPLE–**

*“United Four Seventeen, cross Lakeview V–O–R at and maintain six thousand.”*

**NOTE–**

*The pilot is authorized to conduct descent “at pilot’s discretion,” but must comply with the clearance provision to cross Lakeview VOR at 6,000 feet.*

**EXAMPLE–**

*“United Four Seventeen, descend now to flight level two seven zero, cross Lakeview V–O–R at or below one zero thousand, descend and maintain six thousand.”*

**NOTE–**

*The pilot is expected to promptly execute and complete descent to FL 270 upon receipt of the clearance. After reaching FL 270, the pilot is authorized to descend “at pilot’s discretion” until reaching Lakeview VOR. The pilot must comply with the clearance provision to cross Lakeview VOR at or below 10,000 feet. After Lakeview VOR, the pilot is expected to descend at the rates specified in the AIM until reaching 6,000 feet.*

**NOTE–**

**1.** A descent clearance which specifies a crossing altitude authorizes descent at pilot’s discretion for that portion of the flight to which the crossing altitude restriction applies.

**2.** Any other time that authorization to descend at pilot’s discretion is intended, it must be specifically stated by the controller.

**3.** The pilot may need to know of any future restrictions that might affect the descent, including those that may be issued in another sector, in order to properly plan a descent at pilot’s discretion.

**4.** Controllers need to be aware that the descent rates in the AIM are only suggested and aircraft will not always descend at those rates.

**REFERENCE–**

*P/CG Term– Pilot’s Discretion.*

**e.** When a portion of a climb/descent may be authorized at the pilot’s discretion, specify the altitude the aircraft must climb/descent to followed by the altitude to maintain at the pilot’s discretion.

**PHRASEOLOGY–**

*CLIMB/DESCEND NOW TO (altitude), THEN CLIMB/DESCEND AT PILOT’S DISCRETION MAINTAIN (altitude).*

**EXAMPLE–**

*“United Three Ten, descend now to flight level two eight zero, then descend at pilot’s discretion maintain flight level two four zero.”*

**NOTE–**

**1.** The pilot is expected to commence descent upon receipt of the clearance and to descend as prescribed in the AIM, Para 4–4–10, Adherence to Clearance, until FL 280. At that point, the pilot is authorized to continue descent to FL 240 within context of the term “at pilot’s discretion” as described in the AIM.

**2.** Controllers need to be aware that the descent rates are only suggested and aircraft will not always descend at those rates.

**f.** When the “pilot’s discretion” portion of a climb/descent clearance is being canceled by assigning a new altitude, inform the pilot that the new altitude is an “amended altitude.”

**EXAMPLE–**

*“American Eighty Three, amend altitude, descend and maintain Flight Level two six zero.”*

**NOTE–**

*American Eighty Three, at FL 280, has been cleared to descend at pilot’s discretion to FL 240. Subsequently, the altitude assignment is changed to FL 260. Therefore, pilot’s discretion is no longer authorized.*

**g.** Altitude assignments involving more than one altitude.

**PHRASEOLOGY–**

*MAINTAIN BLOCK (altitude) THROUGH (altitude).*

**h.** 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.
3. When cleared direct to a waypoint/fix without a published altitude, assign a crossing altitude.

**PHRASEOLOGY–**

*DESCEND VIA (STAR name and number).*

*DESCEND VIA (STAR name and number and runway transition number)*

*DESCEND VIA (STAR name and number and runway number).*

*CLIMB VIA (SID name and number).*

*PROCEED DIRECT (fix/waypoint), CROSS (waypoint/fix) at (altitude) THEN DESCEND VIA (STAR name and number)*

**EXAMPLE–**

*“Descend via the Eagul Five arrival.”*

*“Descend via the Wynde Eight Arrival, Runway 28 right transition.”*

*“Descend via the Lendy One Arrival, Runway 22 left.”*

*“Climb via the Dawgs Four Departure.”*

*“Proceed direct Denis, cross Denis at or above flight level two zero zero, then descend via the Mmell One arrival.”*

**NOTE–**

*Pilots must comply with all published speed restrictions on SIDs/STARs, independent of a climb via or descend via clearance.*

*Clearance to “descent via” authorizes pilots:*

1. To descend at pilot discretion to meet published restrictions on a STAR. Pilots navigating on a STAR must maintain the last assigned altitude until receiving clearance to descend via. Once leaving an altitude, the pilot may not return to that altitude without an ATC clearance.
2. When cleared direct to a waypoint, to descend at pilot discretion to meet restrictions on the procedure. ATC assumes obstacle clearance responsibility for aircraft not yet established or taken off of a procedure.

3. To adjust speeds prior to reaching waypoints with published speed restrictions.

**NOTE–**

*When cleared for SIDs that contain published speed restrictions, the pilot must comply with those speed restrictions independent of any “climb via” clearance. Clearance to “climb via” authorizes pilots:*

1. When used in the IFR departure clearance, in a PDC, DCL or when subsequently cleared after departure to a waypoint depicted on a SID, to join a procedure after departure or resume a procedure.
2. When vertical navigation is interrupted and an altitude is assigned to maintain which is not contained on the published procedure, to climb from that previously-assigned altitude at pilot’s discretion to the altitude depicted for the next waypoint. ATC must ensure obstacle clearance until the aircraft is established on the lateral and vertical path of the SID.
3. Once established on the depicted departure, to climb and to meet all published or assigned altitude and speed restrictions.

**REFERENCE–**

*FAA Order JO 7110.65, Para 4–4–2, Route Structure Transitions  
FAA Order JO 7110.65, Para 4–5–6, Minimum En Route Altitudes  
FAA Order JO 7110.65, Para 5–5–9, Separation From Obstructions  
P/CG, Climb Via, Descend Via.*

**NOTE–**

*Pilots cleared for vertical navigation using the phraseology “descend via” or “climb via” must inform ATC, upon initial contact, of the altitude leaving, the runway transition or landing direction if assigned (STARs), and any assigned restrictions not published on the procedure.*

**EXAMPLE–**

*“Delta One Twenty One leaving flight level one niner zero, descending via the Eagul Five arrival runway two-six transition.”*

*“Delta One Twenty One leaving flight level one niner zero for one two thousand, descending via the Eagul Five arrival, runway two-six transition.”*

*“JetBlue six zero two leaving flight level two one zero descending via the Ivane Two arrival landing south.”*

*“Cactus Seven Eleven leaving two thousand climbing via the Laura Two departure.”*

*“Cactus Seven Eleven leaving two thousand for one-six thousand, climbing via the Laura Two departure.”*

**REFERENCE–**

*AIM, Para 5-2-8, Instrument Departure Procedures (DP) – Obstacle  
Departure Procedures (ODP) and Standard Instrument Departures  
(SID)  
P/CG, Top Altitude, Bottom Altitude  
AIM, Para 5-4-1, Standard Terminal Arrival (STAR) Procedures.*

**PHRASEOLOGY–**

(Airport) *ARRIVAL DELAYS* (time in minutes/hours).

**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, course, bearing, track, 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 it, or you consider it necessary.

**PHRASEOLOGY–**

*HOLD (direction) OF (fix/waypoint) ON (specified radial, course, bearing, track, 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.*

f. Issue maximum holding airspeed advisories when an aircraft is:

- 1. Approved to exceed the maximum airspeed 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; or
- 3. Cleared into an airspeed restricted holding pattern in which the icon has not been published.

**EXAMPLE–**

*Due to turbulence, a turboprop requests to exceed the recommended maximum holding airspeed. ATCS may clear the aircraft into a pattern that protects for the airspeed request, and must advise the pilot of the maximum holding airspeed for the holding pattern airspace area.*

**PHRASEOLOGY–**

*“MAXIMUM HOLDING AIRSPEED IS TWO ONE ZERO KNOTS.”*

**4-6-5. VISUAL HOLDING POINTS**

You may use as a holding fix a location which the pilot can determine by visual reference to the surface if he/she is familiar with it.

**PHRASEOLOGY–**

*HOLD AT (location) UNTIL (time or other condition.)*

**REFERENCE–**

*FAA Order JO 7110.65, Para 7-1-4, Visual Holding of VFR Aircraft.*

**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. UNMONITORED NAVAIDS**

Separate an aircraft holding at an unmonitored NAVAID from any other aircraft occupying the course which the holding aircraft will follow if it does not receive signals from the NAVAID.

**4-6-8. ILS PROTECTION/CRITICAL AREAS**

When the official weather observation indicates a ceiling of less than 800 feet or visibility of 2 miles, do not authorize aircraft to hold below 5,000 feet AGL inbound toward the airport on or within 1 statute mile of the localizer between the ILS OM or the fix used in lieu of the OM and the airport. *USAF.* 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.

**REFERENCE–**

*FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), Chapter 17, Basic Holding Criteria.*



*and the military authority which originated the high altitude instrument approach procedure.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 4–7–5, Military Turbojet En Route Descent.*

#### **4–8–5. SPECIFYING ALTITUDE**

Specify in the approach clearance the altitude shown in the approach procedures when adherence to that altitude is required for separation. When vertical separation will be provided from other aircraft by pilot adherence to the prescribed maximum, minimum, or mandatory altitudes, the controller may omit specifying the altitude in the approach clearance.

**NOTE–**

*Use FAA or NGA instrument approach procedures charts appropriate for the aircraft executing the approach.*

#### **4–8–6. CIRCLING APPROACH**

a. Circling approach instructions may only be given for aircraft landing at airports 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 airport/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 AIRPORT/RUNWAY FOR A LEFT/RIGHT BASE/DOWNWIND TO RUNWAY (number).*

**NOTE–**

*Where standard instrument approach procedures (SIAPs) authorize circling approaches, they provide a basic minimum of 300 feet of obstacle clearance at the MDA within the circling area considered. The dimensions of these areas, expressed in distances from the runways, vary for the different approach categories of aircraft. In some cases a SIAP may otherwise restrict circling approach maneuvers.*

c. Do not issue clearances, such as “extend downwind leg,” which might cause an aircraft to

exceed the circling approach area distance from the runways within which required circling approach obstacle clearance is assured.

#### **4–8–7. SIDE-STEP MANEUVER**

**TERMINAL**

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 seven left approach. Side-step to runway seven right.”*

**NOTE–**

*Side-step maneuvers require higher weather minima/MDA. These higher minima/MDA are published on the instrument approach charts.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–3–2, Closed/Unsafe Runway Information.  
P/CG Term– Side-step Maneuver.*

#### **4–8–8. COMMUNICATIONS RELEASE**

If an IFR aircraft intends to land at an airport not served by a tower or FSS, approve a change to the advisory service frequency when you no longer require direct communications.

**PHRASEOLOGY–**

*CHANGE TO ADVISORY FREQUENCY APPROVED.*

**NOTE–**

*An expeditious frequency change permits the aircraft to receive timely local airport traffic information in accordance with AC 90–42, Traffic Advisory Practices at Airports Without Operating Control Towers.*

#### **4–8–9. MISSED APPROACH**

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 instrument approach being flown. An alternate missed approach procedure as published on the appropriate FAA Form 8260 or appropriate military form may be assigned when necessary. Once an aircraft commences a missed approach, it may be radar vectored.

**NOTE—**

1. *Alternate missed approach procedures are published on the appropriate FAA Form 8260 or appropriate military form and require a detailed clearance when they are issued to the pilot.*

2. *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.*

3. *Pilots must advise ATC when intending to apply cold temperature compensation and of the amount of compensation required. Pilots will not apply altitude compensation, unless authorized, when assigned an altitude if provided an initial heading to fly or radar vectors in lieu of published missed approach procedures. Consideration should be given to vectoring aircraft at or above the requested compensating altitude if possible.*

**REFERENCE—**

FAA Order JO 7110.65, Para 4–8–11, Practice Approaches.

FAA Order JO 7110.65, Para 5–6–3, Vectors Below Minimum Altitude.

FAA Order JO 7110.65, Para 5–8–3, Successive or Simultaneous Departures.

FAA Order 8260.19, Flight Procedures and Airspace, Para 8–6–6

FAA Order 8260.3, United States Standard for Terminal Instrument

Procedures (TERPS), Para 2–8–1 and Chapter 16.

AIM, Paragraph 5-5-5, Missed Approach

**4–8–10. APPROACH INFORMATION**

Specify the following in the approach clearance when the pilot says he/she is unfamiliar with the procedure:

- a. Initial approach altitude.
- b. Direction and distance from the holding fix within which procedure turn is to be completed.
- c. Altitude at which the procedure turn is to be made.
- d. Final approach course and altitude.
- e. Missed approach procedures if considered necessary.

**PHRASEOLOGY—**

*INITIAL APPROACH AT (altitude), PROCEDURE TURN AT (altitude), (number) MINUTES/MILES (direction), FINAL APPROACH ON (name of NAVAID) (specified) COURSE/RADIAL/AZIMUTH AT (altitude).*

f. Applicable notations on instrument approach charts which levy on the pilot the responsibility to comply with or act on an instruction; for example, “Straight-in minima not authorized at night,” “Procedure not authorized when glideslope/glidepath not used,” “Use of procedure limited to aircraft authorized to use airport,” “Procedure not authorized

at night,” or a Snowflake icon indicating mandatory cold temperature compensation.

**REFERENCE—**

AIM, Paragraph 5-1-17, Cold Temperature Operations

AIM, Paragraph 5-5-4, Instrument Approach

AIM, Paragraph 5-5-5, Missed Approach

**4–8–11. PRACTICE APPROACHES**

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. Authorize, withdraw authorization, or refuse to authorize practice approaches as traffic conditions require. Normally, approaches in progress should not be terminated.

**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.*

**a. Separation.**

1. IFR aircraft practicing instrument approaches must be afforded approved separation in accordance with Chapter 3, Chapter 4, Chapter 5, Chapter 6, and Chapter 7 minima until:

- (a) The aircraft lands, and the flight is terminated, or
- (b) The pilot cancels the flight plan.

2. Where procedures require 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 must be provided. Controller responsibility for separation begins at the point where the approach clearance becomes effective. Except for super or heavy aircraft, 500 feet vertical separation may be applied between VFR aircraft and between a VFR and an IFR aircraft.

**REFERENCE—**

FAA Order JO 7210.3, Para 6–4–4, Practice Instrument Approaches.

FAA Order JO 7210.3, Para 10–4–5, Practice Instrument Approaches.

3. Where separation services are not provided to VFR aircraft practicing instrument approaches, the controller must;

- (a) Instruct the pilot to maintain VFR.
- (b) Advise the pilot that separation services are not provided.

**PHRASEOLOGY—**

*“(Aircraft identification) MAINTAIN VFR, PRACTICE*

# Chapter 5. Radar

## Section 1. General

### 5-1-1. PRESENTATION AND EQUIPMENT PERFORMANCE

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

**NOTE—**

*The provision of radar service is not limited to the distance and altitude parameters obtained during the commissioning flight check. FAA Order 8200.1, United States Standard Flight Inspection Manual, Chapter 14, Surveillance, describes the surveillance flight inspection procedures.*

### 5-1-2. ALIGNMENT ACCURACY CHECK

**TERMINAL**

a. At locations not equipped with Digital Terminal Automation Systems (DTAS), during relief briefing, or as soon as possible after assuming responsibility for a control position, check the operating equipment for alignment accuracy and display acceptability. Recheck periodically throughout the watch.

**REFERENCE—**

*FAA Order JO 7210.3, Chapter 3, Chapter 8, Chapter 9, Chapter 10, and Chapter 11.  
Comparable Military Directives.*

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

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

**REFERENCE—**

*FAA Order JO 7210.3, Para 3-7-1, Tolerance for Radar Fix Accuracy.*

3. Digital Terminal Automation Systems (DTAS) conduct continuous self-monitoring of

alignment accuracy; therefore, controller alignment checks are not required.

### 5-1-3. ATC SURVEILLANCE SOURCE USE

Use approved ATC Surveillance Sources.

**REFERENCE—**

*FAA Order JO 7110.65, Para 5-1-4, Beacon Range Accuracy.  
FAA Order JO 7110.65, Para 5-2-16, Inoperative or Malfunctioning Interrogator.*

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

1. In Class A airspace.

**REFERENCE—**

*FAA Order JO 7110.65, Para 5-2-17, Failed Transponder in Class A Airspace.  
14 CFR Section 91.135, Operations in Class A Airspace.*

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

(a) Additional coverage is provided by secondary radar beyond that of the primary radar, or

(b) The primary radar is temporarily unusable or out of service. Advise pilots when these conditions exist, or

**PHRASEOLOGY—**

**PRIMARY RADAR UNAVAILABLE** (describe location).  
**RADAR SERVICES AVAILABLE ON TRANSPONDER OR ADS-B EQUIPPED AIRCRAFT ONLY.**

**NOTE—**

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

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

(c) A secondary radar system is the only source of radar data for the area of service. When the system is used for separation, beacon range accuracy is assured, as provided in Paragraph 5-1-4, Beacon Range Accuracy. **TERMINAL.** Advise pilots when these conditions exist.

**NOTE—**

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

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

**c.** All procedures and requirements relating to ATC services using secondary radar targets apply to ATC services provided to targets derived from ADS-B and WAM.

**NOTE–**

*Targets derived from ADS-B and/or WAM cannot be used to provide 3NM separation in the EAS. 3NM targets are not derived from ADS-B and/or WAM within the EAS.*

**REFERENCE–**

FAA Order JO 7110.65, Para 4–1–2, Exceptions.  
FAA Order JO 7110.65, Para 4–4–2, Route Structure Transitions  
FAA Order JO 7110.65, Para 5–5–1, Application  
FAA Order JO 7110.65, Para 6–5–4, Minima Along Other Than Established Airways or Routes  
FAA Order JO 7110.65, Chapter 6, Nonradar  
FAA Order JO 7110.65, Para 5–5–4, Minima  
FAA Order JO 7210.3 3-6-2 ATC Surveillance Source Use

#### 5–1–4. BEACON RANGE ACCURACY

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

**NOTE–**

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

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

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

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

**3.** Refer to beacon range monitoring equipment where so installed.

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

**REFERENCE–**

FAA Order JO 7110.65, Para 5–1–3, Radar Use.

#### 5–1–5. ELECTRONIC ATTACK (EA) ACTIVITY

**a.** Refer all EA activity requests to the appropriate center supervisor.

**REFERENCE–**

FAA Order JO 7610.4, Chapter 2, Section 7, Electronic Attack (EA) and Testing Coordination.

**NOTE–**

*EA activity can subsequently result in a request to apply EA videos to the radar system which may necessitate the decertification of the narrowband search radar. The Systems Engineer should be consulted concerning the effect of EA on the operational use of the narrowband radar prior to approving/disapproving requests to conduct EA activity.*

**b.** When EA activity interferes with the operational use of radar:

**1. EN ROUTE.** Request the responsible military unit or aircraft, if initial request was received directly from pilot, to suspend the activity.

**2. TERMINAL.** Request suspension of the activity through the ARTCC. If immediate cessation of the activity is required, broadcast the request directly to the EA aircraft on the emergency frequency. Notify the ARTCC of direct broadcast as soon as possible.

**c.** When previously suspended activity will no longer interfere:

**1. EN ROUTE.** Inform the NORAD unit or aircraft that it may be resumed.

**2. TERMINAL.** Inform the ARTCC or aircraft that it may be resumed. Obtain approval from the ARTCC prior to broadcasting a resume clearance directly to the aircraft.

**d.** In each stop request, include your facility name, type of EA activity (chaff dispensing–“stream”/“burst” or electronic jamming–“buzzer”), radar band affected and, when feasible, expected duration of suspension.

**PHRASEOLOGY–**

*BIG PHOTO (identification, if known) (name) CENTER/TOWER/APPROACH CONTROL.*

To stop EA activity:

*STOP STREAM/BURST IN AREA (area name) (degree and distance from facility),*

or

*STOP BUZZER ON (frequency band or channel).*

To resume EA activity:

*RESUME STREAM/BURST,*

or

*RESUME BUZZER ON (frequency band or channel).*

### 5-1-6. SERVICE LIMITATIONS

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

1. Separating identified aircraft targets.
2. Vectoring aircraft to intercept a PAR final approach course.
3. Providing radar service in areas that ensure no conflict with traffic on airways, other ATC areas of jurisdiction, restricted or prohibited areas, terrain, etc.

b. *EN ROUTE*. When the position symbol associated with the 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 data block must not be used for the purpose of determining separation.

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

#### REFERENCE-

FAA Order JO 7110.65, Para 2-1-9, Reporting Essential Flight Information.  
FAA Order JO 7210.3, Chapter 3, Chapter 7, Chapter 10 Section 5, and Chapter 11 Section 2.

### 5-1-7. ELECTRONIC CURSOR

#### TERMINAL

a. An electronic cursor may be used to aid in identifying and vectoring an aircraft and to give finer delineation to a video map. Do not use it as a

substitute for a video map or map overlay; e.g., to form intersections, airway boundaries, final approach courses, etc.

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

### 5-1-8. MERGING TARGET PROCEDURES

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

1. Aircraft at 10,000 feet and above.
2. Turbojet aircraft regardless of altitude.

#### REFERENCE-

P/CG Term- Turbojet Aircraft.

3. Presidential aircraft regardless of altitude.

b. Issue traffic information to those 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, MD-80, at one seven thousand."*

*"United Sixteen and American Twenty-five, traffic twelve o'clock, one zero miles, opposite direction, eastbound seven twenty seven at flight level three three zero, westbound MD-Eighty at flight level three one zero."*

c. When both aircraft in subpara b are in RVSM airspace, and vertically separated by 1,000 feet, if either pilot reports they are unable to maintain RVSM due to turbulence or mountain wave, vector either aircraft to avoid merging with the target of the other aircraft.

#### EXAMPLE-

*"Delta One Twenty Three, fly heading two niner zero, vector for traffic. Traffic twelve o'clock, one zero miles, opposite direction, MD-80 eastbound at flight level three two zero."*

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

#### NOTE-

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

e. If unable to provide vector service, inform the pilot.

**NOTE–**

*The phraseology “Unable RVSM due turbulence (or mountain wave)” is only intended for severe turbulence or other weather encounters with altitude deviations of approximately 200 feet or more.*

### 5–1–9. HOLDING PATTERN SURVEILLANCE

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

### 5–1–10. 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.

**NOTE–**

1. RNAV ATS routes have a width of 8 miles and laterally protected airspace of 4 miles on each side of the route centerline

2. Navigation system performance requirements for operations on RNAV ATS routes require the aircraft system be capable of remaining within 2 miles of the route centerline. Aircraft approaching this limit may be experiencing a navigation system error or failure.

**REFERENCE–**

FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments.

FAA Order JO 7110.65, Para 7–9–3, Methods.

FAA Order JO 7400.2, Para 20-5-2, RNAV Route Criteria.

AC90-100A, U.S. Terminal and En Route Area Navigation (RNAV) Operations, Para 8a. Navigation System Accuracy.

### 5–1–11. RADAR FIX POSTING

#### EN ROUTE

A controller is required to manually record at least once the observed or reported time over a fix for each controlled aircraft in their sector of responsibility only when the flight progress recording components of the EAS FDP are not operational.

**REFERENCE–**

FAA Order JO 7210.3, Para 6–1–6, Flight Progress Strip Usage.

FAA Order JO 7210.3, Para 10–1–8, Flight Progress Strip Usage.

### 5–1–12. POSITION REPORTING

If necessary, you may request an aircraft to provide an estimate or report over a specific fix. After an aircraft receives the statement “radar contact” from ATC, it discontinues reporting over compulsory reporting points. It resumes normal position reporting when ATC informs it “radar contact lost” or “radar service terminated.”

**REFERENCE–**

P/CG Term– Radar Contact.

a. 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.

### 5–1–13. RADAR SERVICE TERMINATION

a. Inform aircraft when radar service is terminated.

**PHRASEOLOGY–**

RADAR SERVICE TERMINATED (nonradar routing if required).

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

**NOTE–**

1. Termination of radar monitoring when conducting simultaneous ILS approaches is prescribed in Para 5–9–7, Simultaneous Independent Approaches– Dual & Triple.

2. 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 B airspace, Class C airspace, TRSA, or where basic radar service is provided.

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

## Section 2. Beacon/ADS-B 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 beacon code assignments to only ADS-B and/or transponder-equipped aircraft.

#### NOTE-

*Aircraft equipped with ADS-B are also still required to have an operable transponder. The ATC-assigned code is one of the required message elements of ADS-B Out.*

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

#### PHRASEOLOGY-

*SQUAWK THREE/ALFA (code),*

*or*

*SQUAWK (code).*

#### NOTE-

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

#### REFERENCE-

*FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.*

### 5-2-2. DISCRETE ENVIRONMENT

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

1. **TERMINAL.** Aircraft that will remain within the terminal facility's delegated airspace must be assigned a code from the code subset allocated to the terminal facility.

2. **TERMINAL.** Unless otherwise specified in a facility directive or a letter of agreement, aircraft that will enter an adjacent ATTS facility's delegated airspace must be assigned a beacon code assigned by the ARTCC computer.

#### NOTE-

1. *This will provide the adjacent facility advance information on the aircraft and will cause auto-acquisition of the aircraft prior to handoff.*

2. *When an IFR aircraft, or a VFR aircraft that has been assigned a beacon code by the ARTCC computer and whose flight plan will terminate in another facility's area, cancels ATC service or does not activate the flight plan, ensure that appropriate action is taken to remove strips (RS message) on that aircraft.*

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

c. Coastal facilities accepting "over" traffic that will subsequently be handed-off to an oceanic ARTCC must reassign a new discrete beacon code to an aircraft when it first enters the receiving facility's airspace. The code reassignment must be accomplished by inputting an appropriate message into the computer and issued to the pilot while operating in the first sector/position in the receiving facility's airspace.

#### NOTE-

*Per an agreement between FAA and the Department of Defense, 17 Code subsets in the NBCAP have been reserved for exclusive military use outside NBCAP airspace. To maximize the use of these subsets, they have been allocated to ARTCC's underlying NBCAP airspace that do not abut an oceanic ARTCC's area. To preclude a potential situation where two aircraft might be in the same airspace at the same time on the same discrete code, it is necessary to reassign an aircraft another code as specified in subpara c.*

#### REFERENCE-

*FAA Order JO 7110.65, Para 5-2-4, Mixed Environment.*

*FAA Order JO 7110.65, Para 5-2-10, VFR Code Assignments.*

*FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.*

### 5-2-3. NONDISCRETE ENVIRONMENT

a. Assign appropriate nondiscrete beacon codes from the function codes specified in Paragraph 5-2-6, Function Code Assignments.

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

#### REFERENCE-

*FAA Order JO 7110.65, Para 5-2-4, Mixed Environment.*

*FAA Order JO 7110.65, Para 5-2-10, VFR Code Assignments.*

*FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.*

#### 5-2-4. MIXED ENVIRONMENT

a. When discrete beacon code capability does not exist in your area of responsibility, comply with the procedures specified in Paragraph 5-2-3, Nondiscrete Environment.

**NOTE-**

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

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

1. Comply with the procedures specified in Paragraph 5-2-2, Discrete Environment, and

2. Unless otherwise coordinated at the time of handoff, assign aircraft that will enter the area of responsibility of a nondiscrete-equipped position/sector an appropriate nondiscrete function code from the codes specified in Paragraph 5-2-6, Function Code Assignments, prior to initiating a handoff.

**REFERENCE-**

FAA Order JO 7110.65, Para 4-2-8, IFR-VFR and VFR-IFR Flights.

FAA Order JO 7110.65, Para 5-2-10, VFR Code Assignments.

FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.

#### 5-2-5. RADAR BEACON CODE CHANGES

Unless otherwise specified in a directive or a letter of agreement or coordinated at the time of handoff, do not request an aircraft to change from the code it was squawking in the transferring facility's area until the aircraft is within your area of responsibility.

**REFERENCE-**

FAA Order JO 7110.65, Para 4-2-8, IFR-VFR and VFR-IFR Flights.

FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.

#### 5-2-6. FUNCTION CODE ASSIGNMENTS

Unless otherwise specified by a directive or a letter of agreement, make nondiscrete code assignments from the following categories:

a. Assign codes to departing IFR aircraft as follows:

1. **Code 2000** to an aircraft which will climb to FL 240 or above or to an aircraft which will climb to FL 180 or above where the base of Class A airspace and the base of the operating sector are at FL 180, and for interfacility handoff the receiving sector is also stratified at FL 180. The en route code must not be assigned until the aircraft is established in the high altitude sector.

2. **Code 1100** to an aircraft which will remain below FL 240 or below FL 180 as above.

3. For handoffs from terminal facilities when so specified in a letter of agreement as follows:

(a) Within NBCAP airspace- **Code 0100 to Code 0400** inclusive or any other code authorized by the appropriate service area office.

(b) Outside NBCAP airspace- **Code 1000** or one of the codes from **0100 to 0700** inclusive or any other code authorized by the appropriate service area office.

b. Assign codes to en route IFR aircraft as follows:

**NOTE-**

1. *FL 180 may be used in lieu of FL 240 where the base of Class A airspace and the base of the operating sector are at FL 180, and for interfacility handoff the receiving sector is also stratified at FL 180.*

2. *The provisions of subparas b2(b) and (c) may be modified by facility directive or letter of agreement when operational complexities or simplified sectorization indicate. Letters of agreement are mandatory when the operating sectors of two facilities are not stratified at identical levels. The general concept of utilizing Codes 2100 through 2500 within Class A airspace should be adhered to.*

1. Aircraft operating below FL 240 or when control is transferred to a controller whose area includes the stratum involved.

(a) **Code 1000** may be assigned to aircraft changing altitudes.

(b) **Code 1100** to an aircraft operating at an assigned altitude below FL 240. Should an additional code be operationally desirable, **Code 1300** must be assigned.

2. Aircraft operating at or above FL 240 or when control is transferred to a controller whose area includes the stratum involved.

(a) **Code 2300** may be assigned to aircraft changing altitudes.

(b) **Code 2100** to an aircraft operating at an assigned altitude from FL 240 to FL 330 inclusive. Should an additional code be operationally desirable, **Code 2200** must be assigned.

(c) **Code 2400** to an aircraft operating at an assigned altitude from FL 350 to FL 600 inclusive. Should an additional code be operationally desirable, **Code 2500** must be assigned.

**3. Code 4000** when aircraft are operating on a flight plan specifying frequent or rapid changes in assigned altitude in more than one stratum or other conditions of flight not compatible with a stratified code assignment.

**NOTE–**

**1.** *Categories of flight that can be assigned Code 4000 include certain flight test aircraft, MTR missions, aerial refueling operation requiring descent involving more than one stratum, ALTRVs where continuous monitoring of ATC communications facilities is not required and frequent altitude changes are approved, and other aircraft operating on flight plans requiring special handling by ATC.*

**2.** *Military aircraft operating VFR or IFR in restricted/warning areas or VFR on VR routes will adjust their transponders to reply on Code 4000 unless another code has been assigned by ATC or coordinated, if possible, with ATC.*

**c.** Assign the following codes to arriving IFR aircraft, except military turbojet aircraft as specified in Paragraph 4–7–4, Radio Frequency and Radar Beacon Changes for Military Aircraft:

**NOTE–**

*FL 180 may be used in lieu of FL 240 where the base of Class A airspace and the base of the operating sector are at FL 180, and for interfacility handoff the receiving sector is also stratified at FL 180.*

**1. Code 2300** may be assigned for descents while above FL 240.

**2. Code 1500** may be assigned for descents into and while within the strata below FL 240, or with prior coordination the specific code utilized by the destination controller, or the code currently assigned when descent clearance is issued.

**3.** The applicable en route code for the holding altitude if holding is necessary before entering the terminal area and the appropriate code in subparagraphs 1 or 2.

**REFERENCE–**

*FAA Order JO 7110.65, Para 4–2–8, IFR-VFR and VFR-IFR Flights.*

*FAA Order JO 7110.65, Para 5–2–3, Nondiscrete Environment.*

*FAA Order JO 7110.65, Para 5–2–4, Mixed Environment.*

*FAA Order JO 7110.65, Para 5–2–10, VFR Code Assignments.*

*FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.*

## 5–2–7. 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 radar beacon code environment.

**NOTE–**

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

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

**PHRASEOLOGY–**

**RADAR CONTACT (position). IF FEASIBLE, SQUAWK (code).**

**REFERENCE–**

*FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.*

**c.** The following must be accomplished on a Mode C equipped VFR aircraft which is in emergency but no longer requires the assignment of **Code 7700**:

**1. TERMINAL.** Assign a beacon code that will permit terminal minimum safe altitude warning (MSAW) alarm processing.

**2. EN ROUTE.** An appropriate keyboard entry must be made to ensure en route MSAW (EMSAW) alarm processing.

## 5–2–8. RADIO FAILURE

When you observe a **Code 7600** display, apply the procedures in Paragraph 10–4–4, 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/her transponder to Code 7600.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.*

## 5–2–9. UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK

Code 7400 may be displayed by unmanned aircraft systems (UAS) when the control link between the aircraft and the pilot is lost. Lost link procedures are programmed into the flight management system and associated with the flight plan being flown.

When you observe a Code 7400 display, do the following:

- a. Determine the lost link procedure, as outlined in the Special Airworthiness Certificate or Certificate of Waiver or Authorization (COA).
- b. Coordinate, as required, to allow UAS to execute the lost link procedure.
- c. Advise Operations Supervisor (OS), when feasible, so the event can be documented.
- d. If you observe or are informed by the PIC that the UAS is deviating from the programmed Lost Link procedure, or is encountering another anomaly, treat the situation in accordance with FAA Order JO 7110.65 Chapter 10, Section 1, Paragraph 10-1-1c.

**NOTE-**

1. *The available lost link procedure should, at a minimum, include lost link route of flight, lost link orbit points, lost link altitudes, communications procedures and preplanned flight termination points if the event recovery of the UAS is deemed unfeasible.*
2. *Each lost link procedure may differ and is dependent upon airframe and operation. These items are contained in the flight's Certificate of Authorization or Waiver (COA) and must be made available to ATC personnel in their simplest form at positions responsible for Unmanned Aircraft (UAs).*
3. *Some UA airframes (Global Hawk) will not be programmed upon the NAS Automation roll out to squawk 7400. These airframes will continue to squawk 7600 should a lost link occur. The ATC Specialist must apply the same procedures described above.*

## 5-2-10. VFR CODE ASSIGNMENTS

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

**NOTE-**

1. *Paragraph 5-2-2, Discrete Environment; Paragraph 5-2-3, Nondiscrete Environment, and Paragraph 5-2-4, Mixed Environment, specify code assignment procedures to follow for the three code environments.*
2. *Paragraph 5-2-6, Function Code Assignments, specifies the function code allocation from which an appropriate code for the aircraft indicated in subpara a should be selected. In the terminal environment, additional*

*function codes may be authorized by the appropriate service area office.*

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

(a) As soon as possible after positive identification, and

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

**NOTE-**

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

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

**PHRASEOLOGY-**

**SQUAWK VFR.**

*or*

**SQUAWK 1200.**

**NOTE-**

1. *Aircraft not in contact with an ATC facility may squawk 1255 in lieu of 1200 while en route to/from or within the designated fire fighting area(s).*
2. *VFR aircraft which fly authorized SAR missions for the USAF or USCG may be advised to squawk 1277 in lieu of 1200 while en route to/from or within the designated search area.*
3. *Gliders not in contact with an ATC facility should squawk 1202 in lieu of 1200. Gliders operate under some flight and maneuvering limitations. They may go from essentially stationary targets while climbing and thermaling to moving targets very quickly. They can be expected to make radical changes in flight direction to find lift and cannot hold altitude in a response to an ATC request. Gliders may congregate together for short periods of time to climb together in thermals and may cruise together in loose formations while traveling between thermals.*

**REFERENCE-**

*FAA Order 7110.66, National Beacon Code Allocation Plan.*

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

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

## 5–2–11. BEACON CODE FOR PRESSURE SUIT FLIGHTS AND FLIGHTS ABOVE FL 600

a. Mode 3/A, **Code 4400**, and discrete **Codes 4440 through 4465** are reserved for use by R–71, F–12, U–2, B–57, pressure suit flights, and aircraft operations above FL 600.

**NOTE–**

*The specific allocation of the special use codes in subset 4400 is in FAA Order 7110.66, National Beacon Code Allocation Plan.*

b. Ensure that aircraft remain on **Code 4400** or one of the special use discrete codes in the **4400** subset if filed as part of the flight plan. Except when unforeseen events, such as weather deviations, equipment failure, etc., cause more than one aircraft with same Mode 3/A discrete beacon codes to be in the same or adjacent ARTCC’s airspace at the same time, a controller may request the pilot to make a code change, squawk standby, or to stop squawk as appropriate.

**NOTE–**

*Due to the inaccessibility of certain equipment to the flight crews, **Code 4400** or a discrete code from the **4400** subset is preset on the ground and will be used throughout the flight profile including operations below FL 600. Controllers should be cognizant that not all aircraft may be able to accept the transponder changes identified in the exception. Emergency **Code 7700**, however, can be activated.*

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

## 5–2–12. AIR DEFENSE EXERCISE BEACON CODE ASSIGNMENT

**EN ROUTE**

Ensure exercise FAKER aircraft remain on the exercise flight plan filed discrete beacon code.

**NOTE–**

1. NORAD will ensure exercise FAKER aircraft flight plans are filed containing discrete beacon codes from the Department of Defense code allocation specified in FAA Order JO 7610.4, Special Operations, Appendix 6.

2. NORAD will ensure that those FAKER aircraft assigned the same discrete beacon code are not flight planned in the same or any adjacent ARTCC’s airspace at the same time.

*(Simultaneous assignment of codes will only occur when operational requirements necessitate.)*

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

## 5–2–13. STANDBY OPERATION

You may instruct an aircraft operating on an assigned code to change the transponder/ADS–B to “standby” position:

a. When approximately 15 miles from its destination and you no longer desire operation of the transponder/ADS–B; or

b. When necessary to reduce clutter in a multi–target area, provided you instruct the pilot to return the transponder/ADS–B to “normal” position as soon as possible thereafter.

**PHRASEOLOGY–**

**SQUAWK STANDBY,**

*or*

**SQUAWK NORMAL.**

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

## 5–2–14. CODE MONITOR

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

**REFERENCE–**

FAA Order JO 7110.65, Para 5–2–6, Function Code Assignments.

**NOTE–**

*In addition to alphanumeric and control symbology processing enhancements, the MEARTS and STARS systems are equipped with automatic beacon decoders. Therefore, in facilities where the automatic beacon decoders are providing the control slash video, there is no requirement to have the non–automated decoding equipment operating simultaneously.*

**REFERENCE–**

FAA Order JO 7210.3, Para 3–6–4, Monitoring of Mode 3/A Radar Beacon Codes.

a. This includes the appropriate IFR code actually assigned and, additionally, **Code 1200**, **Code 1202**, **Code 1255**, and **Code 1277** unless your area of responsibility includes only Class A airspace. During periods when ring-around or excessive VFR target presentations derogate the separation of IFR traffic, the monitoring of VFR **Code 1200**, **Code 1202**, **Code**

**1255**, and **Code 1277** may be temporarily discontinued.

**b.** Positions of operation which contain or are immediately adjacent to a restricted area, warning area, VR route, or other categories where Code 4000 can be assigned must monitor **Code 4000** and any other code used in lieu of **4000**. If by local coordination with the restricted/warning area or VR route user a code other than 4000 is to be exclusively used, then this code must be monitored.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–2–6, Function Code Assignments.

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

**NOTE–**

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

**1. Code 7500** (hijack code).

**REFERENCE–**

FAA Order JO 7110.65, Para 10–2–6, Hijacked Aircraft.

**2. Code 7600** (loss of radio communications code).

**5–2–15. 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 facility or the next facility, as applicable, is notified when an aircraft transponder is malfunctioning/inoperative.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

**5–2–16. INOPERATIVE OR MALFUNCTIONING INTERROGATOR**

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

**PHRASEOLOGY–**

(Name of facility or control function) *BEACON INTERROGATOR INOPERATIVE/MALFUNCTIONING.*

**REFERENCE–**

FAA Order JO 7110.65, Para 5–1–3, Radar Use.

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

**5–2–17. FAILED TRANSPONDER OR ADS–B OUT TRANSMITTER**

Disapprove a request or withdraw a previously issued approval to operate with a failed transponder or ADS–B Out solely on the basis of traffic conditions or other operational factors.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–1–3, Radar Use.

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

**5–2–18. VALIDATION OF MODE C READOUT**

Ensure that Mode C altitude readouts are valid after accepting an interfacility handoff, initial track start, track start from coast/suspend tabular list, or during and after an unreliable Mode C readout, except as follows:

**NOTE–**

Consider a Mode C readout unreliable when any condition, not just those that display an indicator in the Data Block, exists that indicates that the Mode C may be in error.

**a.** CTRD–equipped tower cabs are not required to validate Mode C altitude readouts after accepting interfacility handoffs from TRACONs according to the procedures in Paragraph 5–4–3, Methods, subparagraph a4.

**b.** ERAM facilities are not required to validate Mode C altitude readouts after accepting interfacility handoffs from other ERAM facilities, except:

**1.** After initial track start or track start from coast is required, or

**2.** During and after the display of a missing, unreasonable, exceptional, or otherwise unreliable Mode C readout indicator.

**c.** Consider an altitude readout valid when:

1. It varies less than 300 feet from the pilot reported altitude, or

**PHRASEOLOGY–**

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

SAY ALTITUDE.

or

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

SAY FLIGHT LEVEL.

2. You receive a continuous readout from an aircraft on the airport and the readout varies by less than 300 feet from the field elevation, or

**NOTE–**

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

**REFERENCE–**

*FAA Order JO 7110.65, Para 5–2–24, Altitude Filters.*

*FAA Order JO 7110.65, Para 5–14–5, Selected Altitude Limits.*

*FAA Order JO 7210.3, Para 12–2–3, Display Data.*

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

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

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

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

**PHRASEOLOGY–**

*(Location) ALTIMETER (appropriate altimeter), VERIFY ALTITUDE.*

2. If the altitude readout continues to be invalid:

(a) Instruct the pilot to turn off the altitude-reporting part of his/her transponder and include the reason; and

(b) Notify the operations supervisor-in-charge of the aircraft call sign.

**PHRASEOLOGY–**

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

f. Whenever you observe an invalid Mode C readout at or above FL 180, unless the aircraft is descending below Class A airspace:

1. Verify that the pilot is using 29.92 inches of mercury as the altimeter setting and has accurately reported the altitude.

**PHRASEOLOGY–**

*VERIFY USING TWO NINER NINER TWO AS YOUR ALTIMETER SETTING.*

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

VERIFY FLIGHT LEVEL.

2. If the Mode C readout continues to be invalid:

(a) Instruct the pilot to turn off the altitude-reporting part of his/her transponder and include the reason; and

(b) Notify the operational supervisor-in-charge of the aircraft call sign.

**PHRASEOLOGY–**

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

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

## 5–2–19. ALTITUDE CONFIRMATION– MODE C

Request a pilot to confirm assigned altitude 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 altitude, or

b. You assign a new altitude 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 altitude, or

d. **TERMINAL.** The aircraft was transferred to you from another sector/position within your facility (intrafacility).

**PHRASEOLOGY–**

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

*(In climbing/descending situations),*

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

**VERIFY ASSIGNED ALTITUDE** *(altitude).*

*or*

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

**VERIFY ASSIGNED FLIGHT LEVEL** *(flight level).*

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

## **5–2–20. ALTITUDE CONFIRMATION–NON–MODE C**

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

**NOTE–**

*For the purpose of this paragraph, “initial contact” means a pilot’s first radio contact with each sector/position.*

- 1.** The pilot states the assigned altitude, or
- 2.** You assign a new altitude to a climbing or a descending aircraft, or
- 3. TERMINAL.** The aircraft was transferred to you from another sector/position within your facility (intrafacility).

**PHRASEOLOGY–**

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

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

**b. USA.** Reconfirm all pilot altitude read backs.

**PHRASEOLOGY–**

*(If the altitude read back is correct),*

**AFFIRMATIVE** *(altitude).*

*(If the altitude read back is not correct),*

**NEGATIVE. CLIMB/DESCEND AND MAINTAIN** *(altitude),*

*or*

**NEGATIVE. MAINTAIN** *(altitude).*

**REFERENCE–**

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

## **5–2–21. AUTOMATIC ALTITUDE REPORTING**

Inform an aircraft when you want it to turn on/off the automatic altitude reporting feature of its transponder.

**PHRASEOLOGY–**

**SQUAWK ALTITUDE,**

*or*

**STOP ALTITUDE SQUAWK.**

**NOTE–**

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

**REFERENCE–**

FAA Order JO 7110.65, Para 5–2–18, Validation of Mode C Readout.  
FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.  
P/CG Term– Automatic Altitude Report.

## **5–2–22. INFLIGHT DEVIATIONS FROM TRANSPONDER/MODE C REQUIREMENTS BETWEEN 10,000 FEET AND 18,000 FEET**

Apply the following procedures to requests to deviate from the Mode C transponder requirement by aircraft operating in the airspace of the 48 contiguous states and the District of Columbia at and above 10,000 feet MSL and below 18,000 feet MSL, excluding the airspace at and below 2,500 feet AGL.

**NOTE–**

**1.** 14 CFR Section 91.215(b) provides, in part, that all U.S. registered civil aircraft must be equipped with an operable, coded radar beacon transponder when operating in the altitude stratum listed above. Such transponders must have a Mode 3/A 4096 code capability, replying to Mode 3/A interrogation with the code specified by ATC, or a Mode S capability, replying to Mode 3/A interrogations with the code specified by ATC. The aircraft must also be equipped with automatic pressure altitude reporting equipment having a Mode C capability that automatically replies to Mode C interrogations by transmitting pressure altitude information in 100–foot increments.

**2.** The exception to 14 CFR Section 91.215 (b) is 14 CFR Section 91.215(b)(5) which states: except balloons, gliders, and aircraft without engine–driven electrical systems.

**REFERENCE–**

FAA Order JO 7210.3, Chapter 20, Temporary Flight Restrictions.

**a.** Except in an emergency, do not approve inflight requests for authorization to deviate from 14 CFR Section 91.215(b)(5)(i) requirements originated by aircraft without transponder equipment installed.

b. Approve or disapprove other inflight deviation requests, or withdraw approval previously issued to such flights, solely on the basis of traffic conditions and other operational factors.

c. Adhere to the following sequence of action when an inflight VFR deviation request is received from an aircraft with an inoperative transponder or Mode C, or is not Mode C equipped:

1. Suggest that the aircraft conduct its flight in airspace unaffected by the CFRs.

2. Suggest that the aircraft file an IFR flight plan.

3. Suggest that the aircraft provide a VFR route of flight and maintain radio contact with ATC.

d. Do not approve an inflight deviation unless the aircraft has filed an IFR flight plan or a VFR route of flight is provided and radio contact with ATC is maintained.

e. You may approve an inflight deviation request which includes airspace outside your jurisdiction without the prior approval of the adjacent ATC sector/facility providing a transponder/Mode C status report is forwarded prior to control transfer.

f. Approve or disapprove inflight deviation requests within a reasonable period of time or advise when approval/disapproval can be expected.

#### REFERENCE–

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

### 5–2–23. BEACON TERMINATION

Inform the pilot when you want their aircraft's transponder and ADS–B Out turned off.

#### PHRASEOLOGY–

STOP SQUAWK.

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

STOP SQUAWK (mode in use).

#### REFERENCE–

FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

### 5–2–24. ALTITUDE FILTERS

#### TERMINAL

Set altitude filters to display Mode C altitude readouts to encompass all altitudes within the controller's jurisdiction. Set the upper limits no lower than 1,000 feet above the highest altitude for which the controller is responsible. In those stratified positions, set the lower limit to 1,000 feet or more below the lowest altitude for which the controller is responsible. When the position's area of responsibility includes down to an airport field elevation, the facility will normally set the lower altitude filter limit to encompass the field elevation so that provisions of Paragraph 2–1–6, Safety Alert, and Paragraph 5–2–18, Validation of Mode C Readout, subpara c2 may be applied. Air traffic managers may authorize temporary suspension of this requirement when target clutter is excessive.

### 5–2–25. INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER

a. Except as provided in Paragraph 5–2–27, inform an aircraft when the ADS–B transmitter appears to be inoperative or malfunctioning. Notify the OS/CIC of the aircraft call sign and location of aircraft.

#### PHRASEOLOGY–

YOUR ADS–B TRANSMITTER APPEARS TO BE INOPERATIVE / MALFUNCTIONING.

b. If a malfunctioning ADS–B transmitter is jeopardizing the safe execution of air traffic control functions, instruct the aircraft to stop ADS–B transmissions, and notify the OS/CIC.

#### PHRASEOLOGY–

STOP ADS–B TRANSMISSIONS, AND IF ABLE, SQUAWK THREE/ALFA (code).

#### NOTE–

Not all aircraft have a capability to disengage the ADS–B transmitter independently from the beacon code squawk.

### 5–2–26. ADS-B ALERTS

a. Call Sign Mis–Match (CSMM). A CSMM alert will occur when the transmitted ADS–B Flight Identification (FLT ID) does not match the flight plan aircraft identification. Inform the aircraft of the CSMM.

#### PHRASEOLOGY–

YOUR ADS–B FLIGHT ID DOES NOT MATCH YOUR FLIGHT PLAN AIRCRAFT IDENTIFICATION.

**b. Duplicate ICAO Address.** If the broadcast ICAO address is shared with one or more flights in the same ADS-B Service Area (regardless of altitude), and radar reinforcement is not available, target resolution may be lost on one or both targets.

**NOTE–**

*Duplicate ICAO Address Alerts appear as “DA” and are associated with the Data Block (DB) on STARS systems. Duplicate ICAO Address Alerts appear as “DUP” and are associated with the DB on MEARTS systems. Duplicate ICAO Address Alerts appear as “Duplicate 24-bit Address” at the AT Specialist Workstation on ERAM systems.*

**c.** If a CSMM or Duplicate ICAO address is jeopardizing the safe execution of air traffic control functions, instruct the aircraft to stop ADS-B transmissions, and notify the OS/CIC.

**PHRASEOLOGY–**

*STOP ADS-B TRANSMISSIONS, AND IF ABLE, SQUAWK THREE/ALFA (code).*

**NOTE–**

*Not all aircraft are capable of disengaging the ADS-B transmitter independently from the transponder.*

## **5-2-27. ADS-B OUT OFF OPERATIONS**

Operators of aircraft with functional ADS-B Out

avionics installed and requesting an exception from the requirement to transmit at all times must obtain authorization from FAA System Operations Security. The OS/CIC should inform you of any ADS-B Out OFF operations in your area of jurisdiction.

**a.** Do not inform such aircraft that their ADS-B transmitter appears to be inoperative.

**b.** Do not approve any pilot request for ADS-B Out OFF operations. Notify the OS/CIC of the request, including the aircraft call sign and location.

**NOTE–**

*14 CFR Section 91.225(f) requires, in part, that “each person operating an aircraft equipped with ADS-B Out must operate this equipment in the transmit mode at all times unless otherwise authorized by the FAA when that aircraft is performing a sensitive government mission for national defense, homeland security, intelligence or law enforcement purposes, and transmitting would compromise the operations security of the mission or pose a safety risk to the aircraft, crew, or people and property in the air or on the ground.”*

**REFERENCE–**

*FAA Order JO 7110.65, Para 5-2-25, Inoperative or Malfunctioning ADS-B Transmitter.*

*FAA Order JO 7210.3, Para 5-4-9, ADS-B Out OFF Operations.*

*FAA Order JO 7110.67, Para 11, Responsibilities.*

## Section 3. Radar Identification

### 5-3-1. APPLICATION

Before you provide radar service, establish and maintain radar identification of the aircraft involved, except as provided in Paragraph 5-5-1, Application, subparas b2, b3 and in Paragraph 8-5-5, Radar Identification Application.

#### REFERENCE-

FAA Order JO 7110.65, Para 3-1-9, Use of Tower Radar Displays.  
FAA Order JO 7110.65, Para 5-1-1, Presentation and Equipment Performance.

### 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 airports with an operating control tower, provided one of the following methods of coordination is accomplished.

1. A verbal rolling/boundary notification is issued for each departure, or

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

#### NOTE-

Nonverbal notification can be accomplished via the use of a manual or electronic “drop tube” or automation.

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

#### 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 separated 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:

#### 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 altitude in your area of jurisdiction before you issue a heading.

#### REFERENCE-

FAA Order JO 7110.65, Para 3-1-9, Use of Tower Radar Displays.  
FAA Order JO 7110.65, Para 5-12-II, Surveillance Unusable.

### 5-3-3. BEACON/ADS-B IDENTIFICATION METHODS

When using only Mode 3/A radar beacon or ADS-B to identify a target, use one of the following methods:

a. Request the pilot to activate the “IDENT” feature of the transponder/ADS-B and then observe the identification display.

#### PHRASEOLOGY-

##### IDENT.

SQUAWK (code) AND IDENT.

b. Request the pilot to change to a specific discrete or nondiscrete code, as appropriate, and then observe the target or code display change. If a code change is required in accordance with Section 2, Beacon/ADS-B Systems, of this chapter, use the codes specified therein.

c. Request the pilot to change their transponder/ADS-B to “standby.” After you observe the target

disappear for sufficient scans to assure that loss of target resulted from placing the transponder/ADS-B in “standby” position, request the pilot to return the transponder to normal operation and then observe the reappearance of the target.

**PHRASEOLOGY–**  
*SQUAWK STANDBY,*

*then*

*SQUAWK NORMAL.*

**d. EN ROUTE.** An aircraft may be considered identified when the full data block is automatically associated with the target symbol of an aircraft that is squawking a discrete code assigned by the computer.

**NOTE–**  
*Paired LDBs in ERAM do not display a beacon code.*

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

**NOTE–**  
*The AIM informs pilots to adjust Mode C transponders and ADS-B with altitude reporting capability activated unless deactivation is requested by ATC. “Squawk altitude” is included here to provide applicable phraseology.*

**REFERENCE–**  
*FAA Order JO 7110.65, Para 3–1–9, Use of Tower Radar Displays.*  
*FAA Order JO 7110.65, Para 5–3–6, Position Information.*

#### **5–3–4. TERMINAL AUTOMATION SYSTEMS IDENTIFICATION METHODS**

**TERMINAL**

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

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

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

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

**c.** A displaced data block must be updated at all times.

**REFERENCE–**  
*FAA Order JO 7110.65, Para 3–1–9, Use of Tower Radar Displays.*

#### **5–3–5. QUESTIONABLE IDENTIFICATION**

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

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

**1.** As described in Paragraph 5–3–2, Primary Radar Identification Methods, or Paragraph 5–3–3, Beacon Identification Methods.

**2.** En route. Ensure that all primary targets are displayed when radar identification is lost or is questionable.

**REFERENCE–**  
*FAA Order JO 7110.65, Para 5–4–3, Methods.*

#### **5–3–6. POSITION INFORMATION**

Inform an aircraft of its position whenever radar identification is established by means of identifying turns or by any of the beacon identification methods outlined in Paragraph 5–3–3, Beacon Identification Methods. Position information need not be given when identification is established by position correlation or when a departing aircraft is identified within 1 mile of the takeoff runway end.

#### **5–3–7. IDENTIFICATION STATUS**

**a.** Inform an aircraft of radar contact when:

**1.** Initial radar identification in the ATC system is established.

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

**PHRASEOLOGY–**  
*RADAR CONTACT (position if required).*

**b.** Inform an aircraft when radar contact is lost.

**PHRASEOLOGY–**  
*RADAR CONTACT LOST (alternative instructions when required).*

### 5-3-8. TARGET MARKERS

#### EN ROUTE

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

ERAM: When you have separation responsibility for an aircraft and a paired track exists, display a full data block (FDB).

### 5-3-9. TARGET MARKERS

#### TERMINAL

a. Retain data blocks that are associated with the appropriate target symbol in order to maintain continuous identity of aircraft. Retain the data block

until the aircraft has exited the sector or delegated airspace, and all potential conflicts have been resolved; including an aircraft that is a point out. The data block must display flight identification and altitude information, as a minimum.

#### NOTE-

*Where delegated airspace extends beyond Class B and/or Class C airspace, the following will apply: If a VFR aircraft is clear of Class B and Class C airspace and radar services have been terminated then retention of the data block is no longer required.*

b. During prearranged coordination procedures, the controllers who penetrate another controller's airspace must display data block information of that controller's aircraft which must contain, at a minimum, the position symbol and altitude information.

#### REFERENCE-

*FAA Order JO 7110.65, Para 2-1-14, Coordinate Use of Airspace.*

*FAA Order JO 7110.65, Para 5-4-3, Methods.*

*FAA Order JO 7110.65, Para 5-4-8, Automated Information Transfer (AIT).*

*FAA Order JO 7110.65, Para 5-4-9, Prearranged Coordination.*

*FAA Order JO 7210.3, Para 3-7-7, Prearranged Coordination.*



controller's area of jurisdiction unless otherwise specified by a LOA or a facility directive.

**3.** Restrictions issued to ensure separation are passed to the receiving controller.

**d.** After transferring communications, continue to comply with the requirements of subparas c1 and 2.

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

**f.** Comply with the provisions of Paragraph 2-1-17, Radio Communications Transfer, subparas a and b. To the extent possible, transfer communications when the transfer of radar identification has been accepted.

**NOTE-**

*Before the ARTS/STARS "modify/quick look" function is used to transfer radar identification, a facility directive which specifies communication transfer points is required.*

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

- 1.** Assigned heading.
- 2.** Air speed restrictions.
- 3.** Altitude 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.

**h.** Ensure that the data block is associated with the appropriate target.

**i.** Initiate verbal coordination to verify the position of primary or nondiscrete targets when using the automated handoff functions except for intrafacility handoffs using single-sensor systems or multisensor systems operating in a mosaic RDP mode.

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

**k.** Advise the receiving controller if radar monitoring is required.

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

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

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

## **5-4-6. RECEIVING CONTROLLER HANDOFF**

The receiving controller must:

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

**REFERENCE-**

*FAA Order JO 7110.65, Para 2-1-14, Coordinate Use of Airspace.*

*FAA Order JO 7110.65, Para 2-1-15, Control Transfer.*

*FAA Order JO 7110.65, Para 5-4-5, Transferring Controller Handoff.*

**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 transferring controller unless otherwise coordinated.

**d.** 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 facility and the aircraft identification is assured by sequencing or positioning prior to the handoff.

**REFERENCE-**

*FAA Order JO 7110.65, Para 5-9-5, Approach Separation Responsibility.*

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

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

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

**NOTE—**

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

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

f. Take the identified action prior to accepting control of a track when the following indicators are displayed in the data block:

1. "AMB" and "AM": advise the other facility that a disparity exists between the position declared by their computer and that declared by your STARS system.

2. "NAT", "NT," or "TU": advise the other facility if a disparity exists between the position declared by their computer and the actual target position.

3. "DATA", "CST", "NONE", "NX", "OLD", or "OL": initiate verbal coordination.

g. ERAM: Notify the OS when a MISM is displayed in the data block.

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

i. If you decide, *after* accepting the transfer of radar identification, to delay the aircraft's climb or descent through the vertical limits of the transferring controller's area of jurisdiction, advise the transferring controller of that decision as soon as possible.

## 5-4-7. POINT OUT

a. The transferring controller must:

1. Obtain approval before permitting an aircraft to enter the receiving controller's delegated airspace.

(a) EN ROUTE: Automated approval may be utilized in lieu of verbal approval. If the receiving controller takes no action, revert to verbal procedures.

**NOTE—**

1. Use fourth line data for aircraft not on their flight plan route.

2. Where specified in a letter of agreement, some facilities may restrict interfacility automated point outs.

**REFERENCE—**

FAA Order JO 7110.65, Para 2-10-1, En Route Or Oceanic Sector Team Responsibilities.

FAA Order JO 7110.65, Para 5-4-3, Methods.

FAA Order JO 7110.65, Para 5-4-10, En Route Fourth Line Data Block Usage.

FAA Order JO 7110.65, Para 5-14-3, Computer Entry of Flight Plan Information.

(b) TERMINAL: Automated point out approval may be utilized in lieu of verbal provided the procedures are contained in a facility directive/LOA.

2. Obtain the receiving controller's approval before making any changes to an aircraft's flight path, altitude, speed, 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 must:

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

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.

closest point that can be determined prior to the landing threshold.

**i. TERMINAL.** When NOWGT is displayed in an aircraft data block, provide *10 miles* separation behind the preceding aircraft and *10 miles* separation to the succeeding aircraft.

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

1. The leading aircraft's weight class is the same or less than the trailing aircraft;
2. Super and heavy aircraft are permitted to participate in the separation reduction as the trailing aircraft only;
3. An average runway occupancy time of 50 seconds or less is documented;
4. CTRDs are operational and used for quick glance references;

**REFERENCE–**

FAA Order JO 7110.65, Para 3–1–9, *Use of Tower Radar Displays.*

5. Turnoff points are visible from the control tower.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–19, *Wake Turbulence.*  
 FAA Order JO 7110.65, Para 3–9–6, *Same Runway Separation.*  
 FAA Order JO 7110.65, Para 5–5–7, *Passing or Diverging.*  
 FAA Order JO 7110.65, Para 5–5–9, *Separation from Obstructions.*  
 FAA Order JO 7110.65, Para 5–8–3, *Successive or Simultaneous Departures.*  
 FAA Order JO 7110.65, Para 5–9–5, *Approach Separation Responsibility.*  
 FAA Order JO 7110.65, Para 7–6–7, *Sequencing.*  
 FAA Order JO 7110.65, Para 7–7–3, *Separation.*  
 FAA Order JO 7110.65 Para 7–8–3, *Separation.*  
 FAA Order JO 7210.3, Para 10–4–10, *Reduced Separation on Final.*

## 5–5–5. VERTICAL APPLICATION

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

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

**REFERENCE–**

FAA Order JO 7110.65, Para 4–5–1, *Vertical Separation Minima.*  
 FAA Order JO 7110.65, Para 5–2–18, *Validation of Mode C Readout.*  
 FAA Order JO 7110.65, Para 7–7–3, *Separation.*

FAA Order JO 7110.65, Para 7–8–3, *Separation.*

FAA Order JO 7110.65, Para 7–9–4, *Separation.*

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

**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 AIM.

2. It is possible that the separation minima described in Paragraph 4–5–1, *Vertical Separation Minima*, Paragraph 7–7–3, *Separation*, Paragraph 7–8–3, *Separation*, or Paragraph 7–9–4, *Separation*, 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 altitude prior to the assignment of that altitude to the second aircraft.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–3, *Procedural Preference.*  
 FAA Order JO 7110.65, Para 4–5–1, *Vertical Separation Minima.*  
 FAA Order JO 7110.65, Para 5–2–18, *Validation of Mode C Readout.*  
 FAA Order JO 7110.65, Para 6–6–1, *Application.*

## 5–5–6. EXCEPTIONS

**a.** Do not use Mode C to effect vertical separation with an aircraft on a cruise clearance, contact approach, or as specified in Paragraph 5–15–4, *System Requirements*, subpara f3.

**REFERENCE–**

FAA Order JO 7110.65, Para 6–6–2, *Exceptions.*  
 FAA Order JO 7110.65, Para 7–4–6, *Contact Approach.*  
 P/CG Term– *Cruise.*

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

1. Severe turbulence is reported.
2. Aircraft are conducting military aerial refueling.

**REFERENCE–**

FAA Order JO 7110.65, Para 9–2–14, *Military Aerial Refueling.*

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

## 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. Single Site ASR or FUSION Mode

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

**NOTE–**

*Two aircraft, both assigned courses and/or radar vectors with an angular difference of at least 15 degrees, is considered a correct application of this paragraph.*

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

**REFERENCE–**

*FAA Order JO 7110.65, Para 1–2–2, Course Definitions.*

2. Single Site ARSR or FUSION Mode when target refresh is only from an ARSR or when in FUSION Mode – ISR is displayed.

(a) Aircraft are on opposite/reciprocal courses and you have observed that they have passed each other; or aircraft are on same or crossing courses/assigned radar vectors and one aircraft has crossed the projected course of the other, and the angular difference between their courses/assigned radar vectors is at least 45 degrees.

**NOTE–**

*Two aircraft, both assigned courses and/or radar vectors with an angular difference of at least 45 degrees, is considered a correct application of this paragraph.*

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

3. Although approved separation may be discontinued, the requirements of Paragraph 5–5–4, Minima, subpara g must be applied when wake turbulence separation is required.

**REFERENCE–**

*FAA Order JO 7110.65, Para 1–2–2, Course Definitions.*

**NOTE–**

*Apply en route separation rules when using multi-sensor mode.*

**b. EN ROUTE.** Vertical separation between aircraft may be discontinued when they are on

opposite courses as defined in Paragraph 1–2–2, Course Definitions; 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 Paragraph 5–5–4, Minima, subpara g must be applied when wake turbulence separation is required.

**EXAMPLE–**

*“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 radar 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–**

*FAA Order JO 7110.65, Para 2–1–13, Formation Flights.*

*FAA Order JO 7110.65, Para 5–5–1, Application.*

*FAA Order JO 7110.65, Para 7–7–3, Separation.*

*P/CG Term– Formation Flight.*

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

## Section 6. Vectoring

### 5-6-1. APPLICATION

Vector aircraft:

a. In controlled airspace for separation, safety, noise abatement, operational advantage, confidence maneuver, or when a pilot requests.

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

c. At or above the MVA or the minimum IFR altitude except as authorized for radar approaches, special VFR, VFR operations, or by Paragraph 5-6-3, Vectors Below Minimum Altitude.

#### NOTE-

*VFR aircraft not at an altitude assigned by ATC may be vectored at any altitude. It is the responsibility of the pilot to comply with the applicable parts of CFR Title 14.*

#### REFERENCE-

*FAA Order JO 7110.65, Para 4-5-6, Minimum En Route Altitudes.*

*FAA Order JO 7110.65, Para 7-5-2, Priority.*

*FAA Order JO 7110.65, Para 7-5-4, Altitude Assignment.*

*FAA Order JO 7110.65, Para 7-7-5, Altitude Assignments.*

*14 CFR Section 91.119, Minimum Safe Altitudes: General.*

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

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

#### REFERENCE-

*FAA Order JO 7110.65, Para 4-4-1, Route Use.*

*FAA Order JO 7110.65, Para 7-2-1, Visual Separation.*

*FAA Order JO 7110.65, Para 7-5-3, Separation.*

*FAA Order JO 7110.65, Para 7-6-1, Application.*

*FAA Order JO 7110.65, Para 9-4-4, Separation Minima.*

*FAA Order JO 7210.3, Chapter 12, Section 1, Terminal VFR Radar Services.*

### 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).*

*FLY 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, and if appropriate, what to expect when radar navigational guidance is terminated.

#### PHRASEOLOGY-

*VECTOR TO (fix or airway).*

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

*VECTOR FOR SPACING.*

*(if appropriate) EXPECT DIRECT (NAVAID, waypoint, fix)*

*VECTOR TO FINAL APPROACH COURSE,*

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

*VECTOR TO (approach name) FINAL APPROACH COURSE.*

#### NOTE-

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

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.

**REFERENCE–**

FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments.

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.

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 (altitude), (if necessary, MAINTAIN (speed)), EXPECT TO RESUME (SID, STAR, etc.).

DEVIATION (restrictions if necessary) APPROVED, MAINTAIN (altitude), (if necessary, MAINTAIN (speed)), EXPECT TO RESUME (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.

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 waypoint and within the service volume of the NAVAID.

**PHRASEOLOGY–**

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

or

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

or

RESUME (SID/STAR/transition/procedure).

**REFERENCE–**

FAA Order JO 7110.65, Chapter 4, Section 1, NAVAID Use Limitations.

FAA Order JO 7110.65, Paragraph 4–5–7, Altitude Information

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) CROSS (NAVAID, fix, waypoint) AT/AT OR ABOVE/AT OR BELOW (altitude), then CLIMB VIA/DESCEND VIA (SID/STAR)

**EXAMPLE–**

“Cleared direct Luxor, then descend via the Ksino One arrival.”

“Cleared direct HITME, cross HITME at or above one one thousand, then climb via the Boach Five departure.”

g. Aircraft may not be vectored off an Obstacle Departure Procedure (ODP), or issued an altitude lower than published altitude on an ODP, until at or above the MVA/MIA, at which time the ODP is canceled.

**NOTE–**

Once an aircraft has been vectored off an Obstacle Departure Procedure, the procedure is canceled and ATC cannot clear the aircraft to resume the ODP.

**REFERENCE–**

P/CG– Obstacle Departure Procedure

h. Aircraft vectored off an RNAV route must be recleared to the next waypoint or as requested by the pilot.

i. When flight data processing is available, update the route of flight in the computer unless an operational advantage is gained and coordination is accomplished.

j. 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–**

FAA Order JO 7110.65, Para 7–6–1, Application.

### **5-6-3. VECTORS BELOW MINIMUM ALTITUDE**

**a.** Except in en route automated environments 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 antenna and before it reaches the minimum altitude for IFR operations if separation from prominent obstacles shown on the radar scope is applied in accordance with the following:

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

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

**REFERENCE-**

*P/CG Term - Obstacle.*

*P/CG Term - Obstruction.*

*P/CG Term - Prominent Obstacle.*

**b.** At those locations where diverse vector areas (DVA) have been established, radar facilities may vector aircraft below the MVA/MIA within the DVA described in facility directives.

**REFERENCE-**

*FAA Order JO 7210.3, Para 3-8-5, Establishing Diverse Vector Area/s (DVA).*



## 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. Terminate speed adjustments when 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, altitudes, 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 altitudes.

**(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:

**1.** At or above FL 390 without pilot consent.

**2.** Executing a published high altitude instrument approach procedure.

**3.** In a holding pattern.

#### **REFERENCE—**

*FAA Order JO 7110.65, Para 4-6-4, Holding Instructions.*

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

**c.** At the time approach clearance or a climb via/descend via clearance is issued, previously assigned speeds must be restated if required.

**d.** Approach clearances or climb via/descend via clearances cancel any previously assigned speeds. Pilots are expected to make their own speed adjustments to fly the approach, SID, or STAR unless assigned speeds 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 240, speeds may be expressed in terms of Mach numbers in 0.01 increments for turbojet aircraft with Mach meters (i.e., Mach 0.69, 0.70, 0.71, etc.).

**NOTE—**

1. Pilots complying with speed adjustment instructions (published or assigned) 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 altitudes, consider that ground speed may vary with altitude. Further speed adjustment may be necessary to attain the desired spacing.

3. Controllers should anticipate pilots will begin adjusting speed at the minimum distance necessary prior to a published speed restriction so as to cross the waypoint/fix at the published speed. Once at the published speed, controllers should expect pilots will maintain the published speed until additional adjustment is required to comply with further published restrictions or ATC assigned speed restrictions.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-6-1, Application.  
FAA Order JO 7110.65, Para 5-7-2, Methods.

**5-7-2. METHODS**

a. Instruct aircraft to:

1. Maintain present/specific speed.
2. Maintain specified speed or greater/less.
3. Maintain the highest/lowest practical speed.
4. Increase or reduce to a specified speed or by a specified number of knots.

**PHRASEOLOGY—**

SAY AIRSPEED.

SAY MACH NUMBER.

MAINTAIN PRESENT SPEED.

MAINTAIN (specific speed) KNOTS.

MAINTAIN (specific speed) KNOTS OR GREATER.

DO NOT EXCEED (speed) KNOTS.

MAINTAIN MAXIMUM FORWARD SPEED.

MAINTAIN SLOWEST PRACTICAL SPEED.

INCREASE/REDUCE SPEED:

TO (specified speed in knots),

or

TO MACH (Mach number),

or

(number of knots) KNOTS.

**EXAMPLE—**

“Increase speed to Mach point seven two.”

“Reduce speed to two five zero.”

“Reduce speed twenty knots.”

“Maintain two eight zero knots.”

“Maintain maximum forward speed.”

**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 14 CFR Section 91.117(a) when cleared below 10,000 feet MSL, within domestic airspace, without notifying ATC. Pilots are expected to comply with the other provisions of 14 CFR Section 91.117 without notification.

2. Speed restrictions of 250 knots do not apply to aircraft operating beyond 12 NM from the coastline within the U.S. Flight Information Region, in offshore Class E airspace below 10,000 feet MSL. However, in airspace underlying a Class B airspace area designated for an airport, or in a VFR corridor designated through such a Class B airspace area, pilots are expected to comply with the 200 knot speed limit specified in 14 CFR Section 91.117(c). (See 14 CFR Sections 91.117(c) and 91.703.)

3. The phrases “maintain maximum forward speed” and “maintain slowest practical 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. To obtain pilot concurrence for a speed adjustment at or above FL 390, as required by Paragraph 5-7-1, Application, use the following phraseology.

**PHRASEOLOGY–**

*(Speed adjustment), IF UNABLE ADVISE.*

**EXAMPLE–**

*“Reduce speed to one niner zero, if unable advise.”*

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),*

*or*

*(number of knots) KNOTS.*

*THEN, DESCEND AND MAINTAIN (altitude).*

**2. Speed reduction following descent.**

**PHRASEOLOGY–**

*DESCEND AND MAINTAIN (altitude).*

*THEN, REDUCE SPEED:*

*TO (specified speed in knots),*

*or*

*TO MACH (Mach number),*

*or*

*(number of knots) KNOTS.*

**NOTE–**

*When specifying descent prior to speed reduction, consider the maximum speed requirements specified in 14 CFR Section 91.117. 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/altitude fix crossing restrictions.

**PHRASEOLOGY–**

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

**EXAMPLE–**

*“Cross Robinsville at and maintain six thousand at two three zero knots.”*

**REFERENCE–**

*FAA Order JO 7110.65, Para 2–4–17, Numbers Usage.*

*FAA Order JO 7110.65, Para 4–5–7, Altitude Information.*

e. When issuing speed adjustments to aircraft cleared on procedures with published speed restrictions specify the point at which the issued restriction begins, ends, or changes the published restrictions.

**PHRASEOLOGY–**

*CROSS (fix/waypoint) AT (speed).*

*MAINTAIN (speed) UNTIL (fix/waypoint),*

*THEN (additional instructions).*

*RESUME PUBLISHED SPEED.*

*COMPLY WITH SPEED RESTRICTIONS.*

*EXCEPT (if required)*

*DELETE SPEED RESTRICTIONS.*

*CLIMB/DESCEND VIA (SID/STAR name and number) (transition if required.)*

**NOTE–**

**1.** Aircraft will meet all published speed restrictions when on any route or procedure with published speed restrictions regardless of climb via or descend via clearance.

**2.** Due to variations of aircraft types, Flight Management Systems, and environmental conditions, ATC should anticipate that aircraft will begin speed adjustments at varying locations along cleared routes or procedures that contain published speed restrictions.

**3.** Issuing speed adjustments to aircraft flying procedures with published speed restrictions may impact the pilot's ability to fly the intended flight profile of the procedure.

**EXAMPLE–**

**1.** “Cross Alisa at two two zero knots, then climb via the TIMMY One departure.”

**NOTE–**

*The aircraft will maintain the ATC assigned speed until Alisa waypoint and will then comply with the speed restrictions on the TIMMY One departure*

**EXAMPLE–**

**2.** “Cross Alisa at one zero thousand, then climb via the TIMMY One departure, except maintain two two zero knots.”

**NOTE–**

*The aircraft will maintain the ATC assigned speed of two two zero knots and will not meet any published speed restrictions. Aircraft will meet all published altitude restrictions after Alisa.*

**EXAMPLE–**

3. “Maintain two two zero knots until BALTR then resume published speed.”

**NOTE–**

The ATC assigned speed assignment of two two zero knots would apply until BALTR. The aircraft would then comply with the published speed restrictions.

**EXAMPLE–**

4. “Descend via the KEPEC Two arrival, except after NIPZO maintain one eight zero knots.”

**NOTE–**

The aircraft will comply with all published restrictions. After NIPZO, the aircraft will continue to comply with altitude restrictions, but will comply with the ATC assigned speed adjustment.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–4–17, Numbers Usage  
FAA Order JO 7110.65, Para 4–5–7, Altitude Information  
FAA Order JO 7110.65, Para 5–7–1, Application

**5–7–3. SPEED ASSIGNMENTS**

When assigning airspeeds, use the following:

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

**NOTE–**

1. On a standard day the Mach numbers equivalent to 250 knots CAS (subject to minor variations) are:

FL 240–0.6  
FL 250–0.61  
FL 260–0.62  
FL 270–0.64  
FL 280–0.65  
FL 290–0.66.

2. A pilot will advise if unable to comply with the speed assignment.

b. To aircraft operating beneath Class B airspace or in a VFR corridor designated through Class B airspace: assign a speed not more than 200 knots.

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

1. Turbojet aircraft:

(a) Assign a speed not less than 210 knots, except for the aircraft as specified in subparagraph b above, 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.

d. 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.

e. To helicopters: Assign a speed not less than 60 knots.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–7–2, Methods.

f. Lower speeds may be assigned when operationally advantageous.

**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 14 CFR Section 91.117(a) when cleared below 10,000 feet MSL, within domestic airspace, without notifying ATC. Pilots are expected to comply with the other provisions of 14 CFR Section 91.117 without notification.

2. Speed restrictions of 250 knots do not apply to aircraft operating beyond 12 NM from the coastline within the U.S. Flight Information Region, in offshore Class E airspace below 10,000 feet MSL. However, in airspace underlying a Class B airspace area designated for an airport, or in a VFR corridor designated through such a Class B airspace area, pilots are expected to comply with the 200 knot speed limit specified in 14 CFR Section 91.117(c). (See 14 CFR Sections 91.117(c) and 91.70).

3. The phrases “maintain maximum forward speed” and “maintain slowest practical 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.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–7–2, Methods.  
14 CFR Sections 91.117(c) and 91.703.

**5–7–4. TERMINATION**

Advise aircraft when speed adjustments are no longer needed.

a. Advise aircraft to “resume normal speed” when ATC-assigned speed adjustments are no longer required and no published speed restrictions apply.

**PHRASEOLOGY–**

RESUME NORMAL SPEED.

**NOTE–**

*“Resume normal speed” is only used where there is no underlying published speed restriction. It does not delete speed restrictions on upcoming segments of flight and does not relieve the pilot of those speed restrictions which are applicable to 14 CFR Section 91.117.*

**b.** Instruct aircraft to “comply with speed restrictions” applicable to the charted procedure or route being flown.

**PHRASEOLOGY–****COMPLY WITH SPEED RESTRICTIONS****NOTE–**

*The phraseology “comply with restrictions” requires compliance with all altitude and/or speed restrictions depicted on the procedure.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 5–6–2, Methods*

**c.** Advise aircraft to “resume published speed” when aircraft have been assigned an unpublished

speed and ATC wants aircraft to meet subsequent published speed restrictions on the route or procedure.

**PHRASEOLOGY–****RESUME PUBLISHED SPEED****REFERENCE–**

*FAA Order JO 7110.65, Para 4–5–7, Altitude Information*

**d.** Advise aircraft when either ATC assigned speed adjustments or published speed restrictions are no longer required.

**PHRASEOLOGY–****DELETE SPEED RESTRICTIONS****NOTE–**

*When deleting published restrictions, ATC must ensure obstacle clearance until aircraft are established on a route where no published restrictions apply. This does not relieve the pilot of those speed restrictions which are applicable to 14 CFR Section 91.117.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 5–7–1, Application*



## Section 8. Radar Departures

### 5-8-1. PROCEDURES

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

### 5-8-2. INITIAL HEADING

a. 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-

1. **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.

2. ATC assumes responsibility for terrain and obstacle avoidance when IFR aircraft are below the minimum IFR altitude (MVA, MIA, MEA) and are taken off departure/missed approach procedures, or are issued go-around instructions, except when utilizing a Diverse Vector Area (DVA) with an aircraft departing from the surface.

#### REFERENCE-

FAA Order JO 7110.65, Para 4-3-2, Departure Clearances.

FAA Order JO 7110.65, Para 5-6-3, Vectors Below Minimum Altitude.

b. Issue an altitude to maintain with the initial heading when the heading will take the aircraft off a departure procedure that contains both a published lateral path to a waypoint and crossing restrictions.

c. When conducting simultaneous parallel runway departures utilizing RNAV SIDs, advise aircraft of the initial fix/waypoint on the RNAV route.

#### PHRASEOLOGY-

RNAV to (fix/waypoint), RUNWAY (number), CLEARED FOR TAKEOFF.

#### EXAMPLE-

“RNAV to MPASS, Runway Two-Six Left, cleared for takeoff.”

#### NOTE-

1. **TERMINAL.** A purpose for an initial waypoint advisory is not necessary since pilots associate this advisory with the flight path to their planned route of flight. Pilots must immediately advise ATC if a different RNAV SID is entered in the aircraft FMS.

2. The SID transition is not restated as it is contained in the ATC clearance.

3. Aircraft cleared via RNAV SIDs designed to begin with a vector to the initial waypoint are assigned a heading before departure.

#### REFERENCE-

FAA Order JO 7110.65, Para 3-9-9, Nonintersecting Converging Runway Operations

FAA Order JO 7110.65, Para 4-3-2, Departure Clearances

AIM, Para 5-2-7, Departure Control

### 5-8-3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES

#### TERMINAL

Separate aircraft departing from the same airport/heliport or adjacent airports/heliports in accordance with the following minima provided radar identification with the aircraft will be established within 1 mile of the takeoff runway end/helipad and courses will diverge by at least the minimum required, as stated below.

#### NOTE-

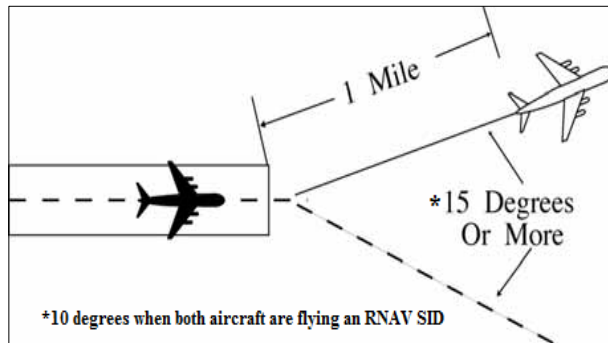
1. FAA Order 8260.46, Departure Procedure (DP) Program, and FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), Volume 4, establishes guidelines for IFR departure turning procedures which assumes a climb to 400 feet above the departure end of runway (DER) elevation before a turn is commenced. TERPS criteria ensures obstacle clearance with a climb gradient of 200 feet per nautical mile from the DER. “Immediately after departure” is considered to be any turn that provides at least the minimum required divergence that commences no later than 2 miles from the DER.

2. Consider known aircraft performance characteristics when applying initial separation to successive departing aircraft.

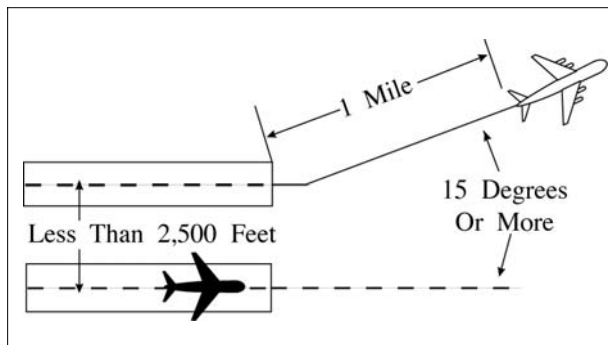
3. When one or both of the departure surfaces is a helipad, use the takeoff course of the helicopter as a reference, comparable to the centerline of a runway and the helipad center as the threshold.

a. Between successive departures from the same runway/helipad or parallel runways/helicopter take-off courses separated by less than 2,500 feet—1 mile if courses diverge by 15 degrees or more immediately after departure. (See FIG 5-8-1, FIG 5-8-2, and FIG 5-8-3.)

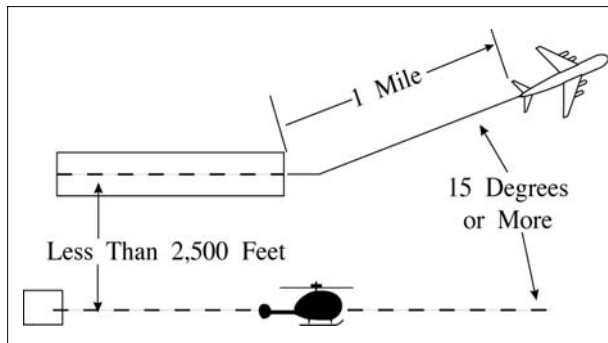
**FIG 5-8-1**  
**Successive Departures**



**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-**

FAA Order JO 7110.65, Para 3-9-7, Wake Turbulence Separation for Intersection Departures.  
FAA Order JO 7110.65, Para 3-9-8, Intersecting Runway/Intersecting Flight Path Operations.  
FAA Order JO 7110.65, Para 5-5-4, Minima.  
FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.

b. Between simultaneous departures departing in the same direction from parallel runways/helicopter takeoff courses, authorize simultaneous takeoffs if the centerlines/takeoff courses are separated by at least 2,500 feet and courses diverge by 15 degrees or more immediately after departure. (See FIG 5-8-4, and FIG 5-8-5.)

**REFERENCE-**

FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.

c. When both aircraft are flying an RNAV SID:

1. Between successive departures from the same runway—1 mile if courses diverge by 10 degrees or more immediately after departure. (See FIG 5-8-1.)

**NOTE-**

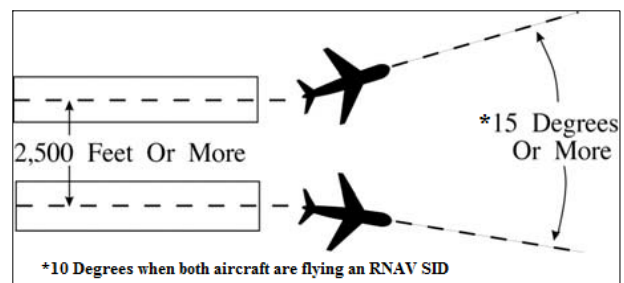
*This procedure does not apply when wake turbulence separation is required.*

2. Between simultaneous departures from parallel runways/helicopter takeoff courses, authorize simultaneous takeoffs if the centerlines/takeoff courses are separated by at least 2,500 feet and courses diverge by 10 degrees or more immediately after departure. (See FIG 5-8-4, and FIG 5-8-5.)

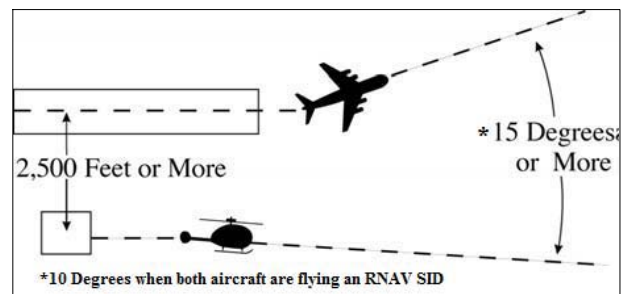
**NOTE-**

*RNAV SIDs specific to this paragraph are those SIDs constructed with a specific lateral path that begins at the DER.*

**FIG 5-8-4**  
**Parallel Runway Departures**



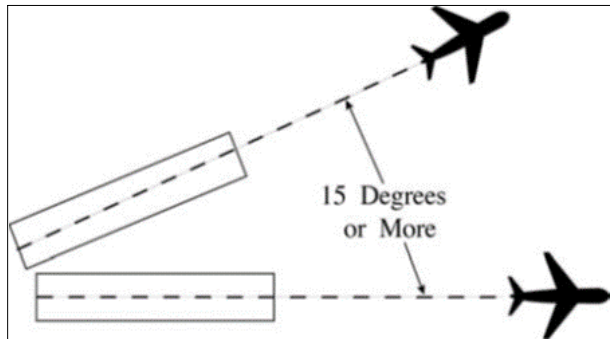
**FIG 5-8-5**  
**Parallel Helicopter Course Departures**



d. Between aircraft departing from diverging runways:

1. Nonintersecting runways. Authorize simultaneous takeoffs if runways diverge by 15 degrees or more. (See FIG 5-8-6.)

FIG 5-8-6  
Nonintersecting Runway Departures



2. Intersecting runways and/or helicopter takeoff courses which diverge by 15 degrees or more. Authorize takeoff of a succeeding aircraft when the preceding aircraft has passed the point of runway and/or takeoff course intersection. When applicable, apply the procedure in Paragraph 3-9-5, Anticipating Separation. (See FIG 5-8-7 and FIG 5-8-8.)

FIG 5-8-7  
Intersecting Runway Departures

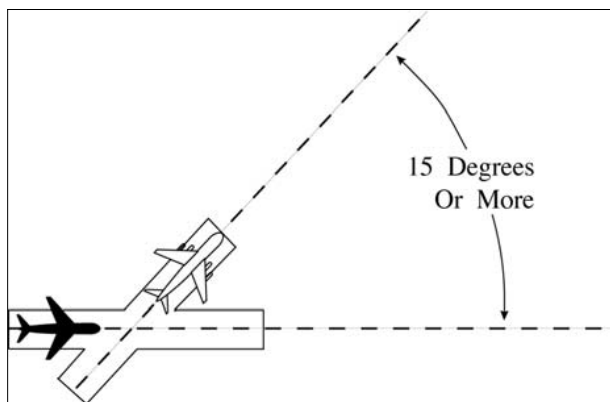
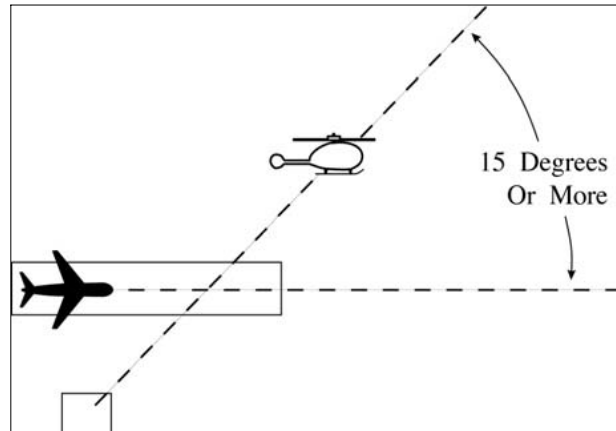


FIG 5-8-8  
Intersecting Helicopter Course Departures



**NOTE-**

*This procedure does not apply when wake turbulence separation is required.*

**REFERENCE-**

*FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.*

#### 5-8-4. DEPARTURE AND ARRIVAL

**TERMINAL.** Except as provided in Paragraph 5-8-5, Departures and Arrivals on Parallel or Nonintersecting Diverging Runways, separate a departing aircraft from an arriving aircraft on final approach by a minimum of 2 miles if separation will increase to a minimum of 3 miles (5 miles when 40 miles or more from the antenna) within 1 minute after takeoff.

**NOTE-**

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

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

#### 5-8-5. DEPARTURES AND ARRIVALS ON PARALLEL OR NONINTERSECTING DIVERGING RUNWAYS

**TERMINAL.** Authorize simultaneous operations between an aircraft departing on a runway and an aircraft on final approach to another parallel or nonintersecting diverging runway if the departure

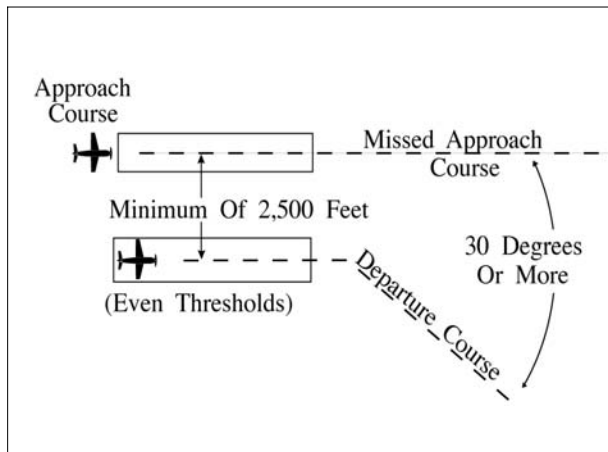
course diverges immediately by at least 30 degrees from the missed approach course until separation is applied and provided one of the following conditions are met:

**NOTE—**

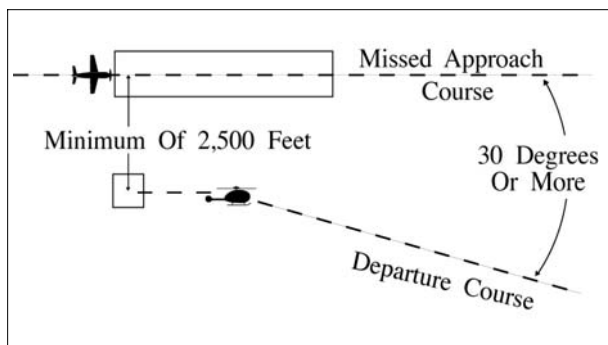
When one or both of the takeoff/landing surfaces is a helipad, consider the helicopter takeoff course as the runway centerline and the helipad center as the threshold.

a. When parallel runway thresholds are even, the runway centerlines are at least 2,500 feet apart. (See FIG 5-8-9 and FIG 5-8-10.)

**FIG 5-8-9  
Parallel Thresholds are Even**



**FIG 5-8-10  
Parallel Thresholds are Even**

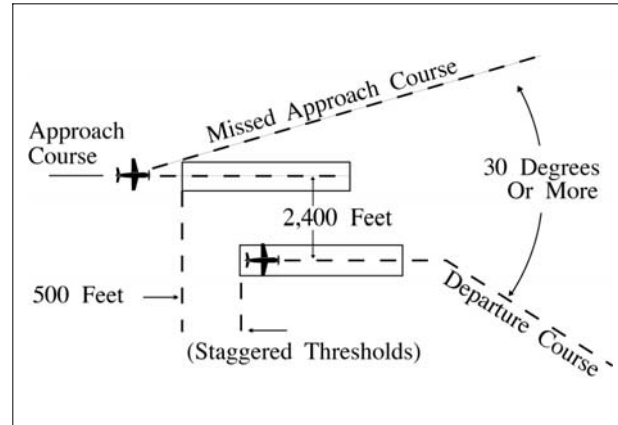


b. When parallel runway thresholds are staggered and:

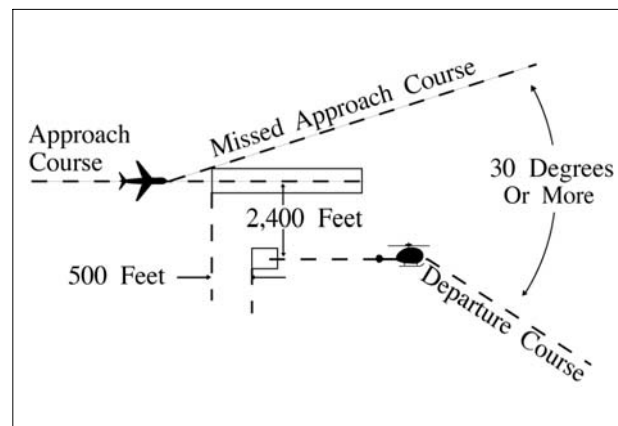
1. The arriving aircraft is approaching the nearer runway: the centerlines are at least 1,000 feet apart and the landing thresholds are staggered at least 500 feet for each 100 feet less than 2,500 the

centerlines are separated. (See FIG 5-8-11 and FIG 5-8-12.)

**FIG 5-8-11  
Parallel Thresholds are Staggered**



**FIG 5-8-12  
Parallel Thresholds are Staggered**



**NOTE—**

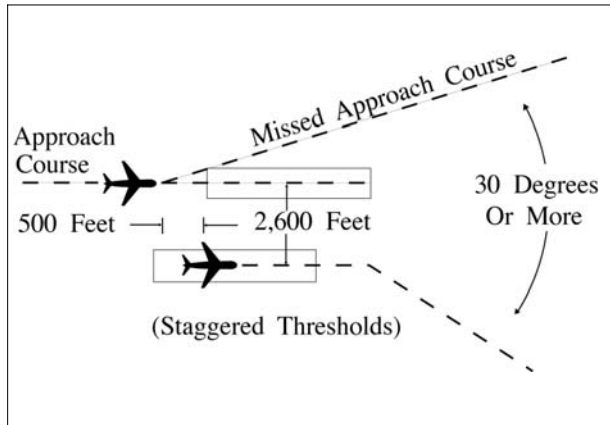
In the event of a missed approach by an aircraft requiring wake turbulence separation behind it, apply the procedures in Paragraph 3-9-6, Same Runway Separation and/or Paragraph 3-9-8, Intersecting Runway/Intersecting Flight Path Operations to ensure that the larger aircraft does not overtake or cross in front of an aircraft departing from the adjacent parallel runway.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.

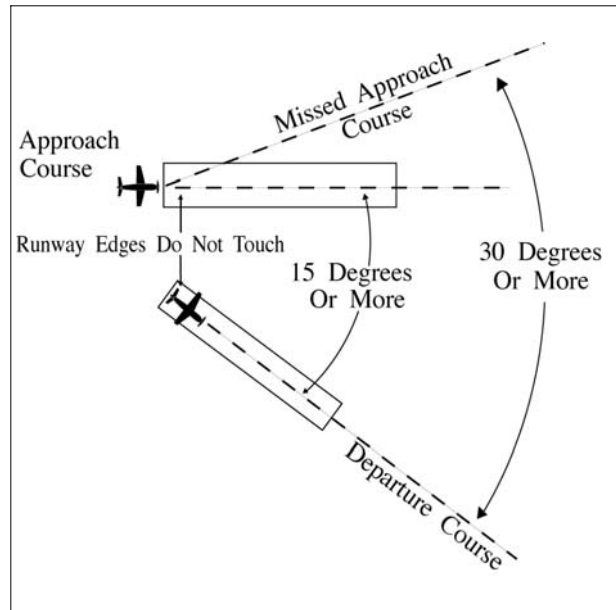
2. The arriving aircraft is approaching the farther runway: the runway centerlines separation exceeds 2,500 feet by at least 100 feet for each 500 feet the landing thresholds are staggered. (See FIG 5-8-13.)

FIG 5-8-13

**Parallel Thresholds are Staggered**

c. When nonintersecting runways diverge by 15 degrees or more and runway edges do not touch. (See FIG 5-8-14.)

FIG 5-8-14

**Diverging Nonintersecting Runways**

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, or c.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-8-4, Departure and Arrival.



**NOTE—**

*Communications transfer to the tower controller's frequency must be completed prior to losing vertical separation between aircraft.*

**d.** Provide the minimum applicable radar separation between aircraft on the same final approach course.

**REFERENCE—**

*FAA Order JO 7110.65, Para 5-5-4, Minima.*

**e.** The following conditions must be met when conducting dual and triple PRM approaches:

- 1.** Straight-in landings will be made.
- 2.** All appropriate communication, navigation, and surveillance systems are operating normally.
- 3.** Inform aircraft that PRM approaches are in use prior to aircraft departing an outer fix. This information may be provided through the ATIS.
- 4.** Clear the aircraft to descend to the appropriate glideslope/glidepath intercept altitude soon enough to provide a period of level flight to dissipate excess speed. Provide at least 1 mile of straight flight prior to the final approach course intercept.

**NOTE—**

*Not applicable to approaches with RF legs.*

**5.** An NTZ at least 2,000 feet wide is established an equal distance between extended runway final approach courses and must be depicted on the monitor display. The primary responsibility for navigation on the final approach course rests with the pilot. Control instructions and information are issued only to ensure separation between aircraft and to prevent aircraft from penetrating the NTZ.

**6.** Monitor all approaches regardless of weather. Monitor local control frequency to receive any aircraft transmission. Issue control instructions as necessary to ensure aircraft do not enter the NTZ.

**7.** Separate monitor controllers, each with transmit/receive and override capability on the local control frequency, must ensure aircraft do not penetrate the depicted NTZ. Facility directives must define the responsibility for providing the minimum applicable longitudinal separation between aircraft on the same final approach course.

**NOTE—**

*The aircraft is considered the center of the digitized target*

*for the purposes of ensuring an aircraft does not penetrate the NTZ.*

**f.** The following procedures must be used by the final monitor controllers:

**1.** Provide position information to an aircraft that is (left/right) of the depicted final approach course centerline, and in your judgment is continuing on a track that may penetrate the NTZ.

**PHRASEOLOGY—**

*(Aircraft call sign) I SHOW YOU (left/right) OF THE FINAL APPROACH COURSE.*

**2.** Instruct the aircraft to return immediately to the correct final approach course when aircraft are observed to overshoot the turn-on or continue on a track which will penetrate the NTZ.

**PHRASEOLOGY—**

*YOU HAVE CROSSED THE FINAL APPROACH COURSE. TURN (left/right) IMMEDIATELY AND RETURN TO THE FINAL APPROACH COURSE.*

*or*

*TURN (left/right) AND RETURN TO THE FINAL APPROACH COURSE.*

**3.** Instruct aircraft on the adjacent final approach course to alter course to avoid the deviating aircraft when an aircraft is observed penetrating or in your judgment will penetrate the NTZ.

**NOTE—**

*An instruction that may include a descent to avoid the deviating aircraft should only be used when there is no other reasonable option available to the controller. In such a case, the descent must not put the aircraft below the MVA.*

**PHRASEOLOGY—**

*TRAFFIC ALERT, (call sign), TURN (left/right) IMMEDIATELY HEADING (DEGREES), CLIMB AND MAINTAIN (altitude).*

**4.** Terminate radar monitoring when one of the following occurs:

- (a)** Visual separation is applied.
- (b)** The aircraft reports the approach lights or runway in sight.
- (c)** The aircraft is 1 mile or less from the runway threshold, if procedurally required, and contained in facility directives.

**5.** Do not inform the aircraft when radar monitoring is terminated.

**6.** Do not apply the provisions of Paragraph 5-13-1, Monitor on PAR Equipment, for PRM approaches.

**g.** Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight when PRM approaches are being conducted to parallel runways. Factors include, but are not limited to, wind direction/velocity, windshear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of the approach in use.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–1–13, *Radar Service Termination*.  
FAA Order JO 7110.65, Para 5–9–2, *Final Approach Course Interception*.

## **5–9–9. SIMULTANEOUS OFFSET INSTRUMENT APPROACHES (SOIA)**

### **TERMINAL**

**a.** Simultaneous offset instrument approaches (SOIA) may be conducted at FAA designated airports that have an authorization issued by the Director, Operations–Headquarters, AJT–2, in coordination with AFS with parallel runways that have centerlines separated by at least 750 feet and less than 3,000 feet with one final approach course offset by 2.5 to 3.0 degrees; and

**1.** Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft during turn–on to final approaches.

**NOTE–**

*Communications transfer to the tower controller's frequency must be completed prior to losing vertical separation between aircraft.*

**2.** Provide the minimum applicable radar separation between aircraft on the same final approach course.

**3.** Provide the minimum applicable radar separation between the trailing offset aircraft of a leading SOIA pair and the lead straight-in aircraft in the subsequent SOIA pair when the parallel runways have centerlines separated by less than 2,500 feet.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–5–4, *Minima*.

**b.** The following conditions are required when applying the minimum separation between lead straight-in and offset trailing approaches with glideslope courses or vertical navigation authorized in subparagraph a above:

**1.** Straight–in landings will be made.

**2.** All appropriate communication, navigation, and surveillance systems are operating normally.

**3.** Inform aircraft that PRM approaches are in use prior to aircraft departing an outer fix. This information may be provided through the ATIS.

**4.** Clear the aircraft to descend to the appropriate glideslope/glidepath intercept altitude soon enough to provide a period of level flight to dissipate excess speed. Provide at least 1 mile of straight flight prior to the final approach course intercept.

**NOTE–**

*Not applicable to approaches with RF legs.*

**5.** A No Transgression Zone (NTZ) at least 2,000 feet wide is established an equal distance between extended runway final approach courses and must be depicted on the monitor display. The NTZ begins prior to the point where adjacent inbound aircraft first lose vertical separation and extends to a point coincident with the location of the offset approach MAP. The primary responsibility for navigation on the final approach course rests with the pilot. Control instructions and information are issued only to ensure separation between aircraft and to prevent aircraft from penetrating the NTZ.

**6.** Monitor all approaches regardless of weather. Monitor local control frequency to receive any aircraft transmission. Issue control instructions as necessary to ensure aircraft do not enter the NTZ.

**7.** Separate monitor controllers, each with transmit/receive and override capability on the local control frequency, must ensure aircraft do not penetrate the depicted NTZ. Facility directives must define the responsibility for providing the minimum applicable longitudinal separation between aircraft on the same final approach course and the minimum applicable longitudinal separation between the trailing offset aircraft of a leading SOIA pair and the lead straight in aircraft in the subsequent SOIA pair when the parallel runways have centerlines separated by less than 2,500 feet.

**NOTE–**

*The aircraft is considered the center of the digitized target for that aircraft for the purposes of ensuring an aircraft does not penetrate the NTZ.*

**c.** The following procedures must be used by the final monitor controllers:

1. Provide position information to an aircraft that is (left/right) of the depicted final approach course centerline, and in your judgment is continuing on a track that may penetrate the NTZ.

**PHRASEOLOGY–**

*(Aircraft call sign) I SHOW YOU (left/right) OF THE FINAL APPROACH COURSE.*

2. Instruct the aircraft to return immediately to the correct final approach course when aircraft are observed to overshoot the turn-on or continue on a track which will penetrate the NTZ.

**PHRASEOLOGY–**

*YOU HAVE CROSSED THE FINAL APPROACH COURSE. TURN (left/right) IMMEDIATELY AND RETURN TO FINAL APPROACH COURSE.*

*or*

*TURN (left/right) AND RETURN TO THE FINAL APPROACH COURSE.*

3. Instruct aircraft on the adjacent final approach course to alter course to avoid the deviating aircraft when an aircraft is observed penetrating or in your judgment will penetrate the NTZ.

**NOTE–**

*An instruction that may include a descent to avoid the deviating aircraft should only be used when there is no other reasonable option available to the controller. In such a case, the descent must not put the aircraft below the MVA.*

**PHRASEOLOGY–**

*TRAFFIC ALERT, (call sign), TURN (left/right) IMMEDIATELY HEADING (DEGREES), CLIMB AND MAINTAIN (altitude).*

4. Terminate radar monitoring when one of the following occurs:

(a) The lead straight in aircraft passes the end of the NTZ nearest the runway threshold.

(b) The trailing offset aircraft passes the end of the NTZ nearest the runway threshold and has reported the lead straight in aircraft in sight.

(c) The aircraft begins the visual segment of the approach.

5. Do not inform the aircraft when radar monitoring is terminated.

6. Do not apply the provisions of Paragraph 5-13-1, Monitor on PAR Equipment, for simultaneous approaches.

d. Advise the pilot of the trailing offset aircraft of traffic on the adjacent lead straight-in approach course, if that traffic will be a factor in the visual segment of the approach. The provisions of Paragraph 7-2-1, Visual Separation, subparagraph a1, concerning visual separation between aircraft being provided by the tower must not be applied to aircraft conducting SOIAs.

**NOTE–**

*Once advised, the pilot is authorized to continue past the offset approach MAP if all of the following conditions are met: The pilot has the straight-in approach traffic in sight and expects the traffic to remain in sight; the pilot advises ATC that the traffic is in sight; and the pilot has the runway environment in sight. Otherwise, it is the pilot's responsibility to execute a missed approach at the offset approach MAP.*

e. Ensure that the trailing offset aircraft is positioned to facilitate the flight crew's ability to see the lead straight in traffic from the nominal clear-of-clouds point to the offset approach MAP so that the flight crew can remain separated from that traffic visually from the offset approach MAP to the runway threshold.

**NOTE–**

*After accepting a clearance for an offset PRM approach, pilots must remain on the offset approach course until passing the offset approach MAP prior to alignment with the runway centerline. Between the offset approach MAP and the runway threshold, the pilot of the offset approach aircraft assumes visual separation responsibility from the aircraft on the straight-in approach, which means maneuvering the aircraft as necessary to avoid the straight in approach traffic until landing, and providing wake turbulence avoidance, if necessary.*

f. In the visual segment between the offset approach MAP and the runway threshold, if the pilot of the trailing offset aircraft loses visual contact with the lead straight-in traffic, the pilot must advise ATC as soon as practical and follow the published missed approach procedure. If necessary, issue alternate missed approach instructions.

g. Wake turbulence requirements between aircraft on adjacent final approach courses inside the offset approach MAP are as follows (standard in-trail wake separation must be applied between aircraft on the same approach course):

1. When runways are at least 2,500 feet apart, there are no wake turbulence requirements between aircraft on adjacent final approach courses.

2. For runways less than 2,500 feet apart, whenever the ceiling is greater than or equal to 500 feet above the MVA, wake vortex spacing between aircraft on adjacent final approach courses need not be applied.

3. For runways less than 2,500 feet apart, whenever the ceiling is less than 500 feet above the MVA, wake vortex spacing between aircraft on adjacent final approach courses, as described in Paragraph 5-5-4, Minima, must be applied unless acceptable mitigating techniques and operational procedures have been documented and verified by an AFS safety assessment and authorized by the Director, Operations-Headquarters, AJT-2. The wake turbulence mitigation techniques employed will be based on each airport's specific runway geometry and meteorological conditions and implemented through local facility directives.

4. Issue all applicable wake turbulence advisories.

**REFERENCE—**

FAA Order JO 8260.49, Para 13.0, *Wake Turbulence Requirements.*

FAA Order JO 7210.3, Para 10-4-6, *Simultaneous Independent Approaches.*

FAA Order JO 7110.65, Para 2-1-20, *Wake Turbulence Cautionary Advisories.*

FAA Order JO 7110.65, Para 5-5-4, *Minima.*

h. Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight when conducting SOIA to parallel runways. Factors include but are not limited to wind direction/velocity, wind-shear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of the approach in use.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-1-13, *Radar Service Termination.*

FAA Order JO 7110.65, Para 5-9-2, *Final Approach Course Interception.*

## 5-9-10. SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY-SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS

### TERMINAL

a. Simultaneous independent approaches to widely-spaced parallel runways may only be

conducted where instrument approach charts specifically authorize simultaneous approaches.

b. Apply the following minimum separation when conducting simultaneous independent approaches to runway centerlines that are separated by more than 9,000 feet with a field elevation at or below 5,000 feet MSL, or 9,200 feet between runway centerlines with a field elevation above 5,000 feet MSL:

1. Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft:

(a) during turn-on to parallel final approach, or

(b) conducting EoR operations, until aircraft are established on a published segment of an approach authorized for EoR operations.

**NOTE—**

*Aircraft are considered EoR on an initial or intermediate segment of an instrument approach authorized for EoR operations after the approach clearance has been issued, read back by the pilot and the aircraft is observed on the published procedure (lateral and vertical path, and within any procedure specified speed restriction), and is conducting a simultaneous independent parallel approach with an authorized simultaneous instrument approach to a parallel runway.*

**REFERENCE—**

FAA Order JO 7210.3, Para 10-4-7, *Simultaneous Widely-Spaced Parallel Operations*

P/CG Term – *Required Navigation Performance (RNP)*

P/CG Term – *Established on RNP Concept*

2. Provide the minimum applicable radar separation between aircraft on the same final approach course.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-5-4, *Minima.*

c. The following conditions are required when applying the minimum separation on widely-spaced parallel courses allowed in subpara b:

1. Straight-in landings will be made.

2. The approach system, radar, and appropriate frequencies are operating normally.

3. Inform aircraft that simultaneous approaches are in use prior to aircraft departing an outer fix. This information may be provided through the ATIS.

4. Clear an aircraft to descend to the appropriate glideslope/glidepath intercept altitude soon enough to provide a period of level flight to dissipate excess speed. Provide at least 1 mile of straight flight prior to the final approach course intercept.

**NOTE–**

*Not applicable to approaches with RF legs.*

**5.** Separate final and local controllers are required for each final. Aircraft on the final must be on the appropriate final controller frequency for that runway.

**6.** Transfer of communication to the tower controller's frequency must be specified in a facility directive and/or Letter of Agreement.

**d.** The following procedures must be used by the final approach controllers:

**NOTE–**

*There is no requirement for establishment of a NTZ.*

**1.** Instruct the aircraft to return to the correct final approach course when that aircraft is observed to overshoot the turn-on or continue on a track which deviates from the final approach course in the direction of the adjacent approach course.

**PHRASEOLOGY–**

*YOU HAVE CROSSED THE FINAL APPROACH COURSE. TURN (left/right) IMMEDIATELY AND RETURN TO THE FINAL APPROACH COURSE,*

*or*

*TURN (left/right) AND RETURN TO THE FINAL APPROACH COURSE.*

**2.** Instruct aircraft on adjacent final approach course to alter course to avoid the deviating aircraft when an aircraft is observed, or in the controller's judgment, has deviated from the final approach course in the direction of the adjacent approach course.

**PHRASEOLOGY–**

*TRAFFIC ALERT, (call sign), TURN (left/right) IMMEDIATELY HEADING (degrees), CLIMB AND MAINTAIN (altitude)*

**e.** Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight when simultaneous approaches are being conducted to parallel runways. Factors include, but are not limited to, wind direction/velocity, wind-shear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of approach in use.

**REFERENCE–**

*FAA Order JO 7110.65, Para 5–9–2, Final Approach Course Interception.*

**5–9–11. TRANSITIONAL PROCEDURE**

When aircraft are conducting simultaneous dependent, independent, or any approaches allowing for reduced separation, and one of the aircraft executes a go-around or has its approach clearance terminated and prior to losing the approved reduced separation, control instructions must be expeditiously issued to increase separation between the applicable aircraft. These control instructions must establish approved separation (for example, altitude and/or lateral separation via divergence). In addition, wake turbulence cautionary advisories must be issued in accordance with Paragraph 2–1–20, Wake Turbulence Cautionary Advisories.



## Section 14. Automation– En Route

### 5–14–1. CONFLICT ALERT (CA) AND MODE C INTRUDER (MCI) ALERT

a. When a CA or MCI alert is displayed, evaluate the reason for the alert without delay and take appropriate action.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–6, Safety Alert.

b. 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.

c. Suppressing/Inhibiting CA/MCI alert.

1. The controller may suppress the display of a CA/MCI alert from a control position with the application of one of the following suppress/inhibit computer functions:

(a) The Conflict Suppress (CO) function may be used to suppress the CA/MCI display between specific aircraft for a specific alert.

**NOTE–**

See NAS–MD–678 for the EARTS conflict suppress message.

(b) The Group Suppression (SG) function must be applied exclusively to inhibit the displaying of alerts among military aircraft engaged in special military operations where standard en route separation criteria does not apply.

**NOTE–**

Special military operations where the SG function would typically apply involve those activities where military aircraft routinely operate in proximities to each other that are less than standard en route separation criteria; i.e., air refueling operations, ADC practice intercept operations, etc.

2. The computer entry of a message suppressing a CA/MCI alert constitutes acknowledgment for the alert and signifies that appropriate action has or will be taken.

3. The CA/MCI alert may not be suppressed or inhibited at or for another control position without being coordinated.

### 5–14–2. EN ROUTE MINIMUM SAFE ALTITUDE WARNING (E-MSAW)

a. When an E-MSAW alert is displayed, immediately analyze the situation and take the appropriate action to resolve the alert.

**NOTE–**

Caution should be exercised when issuing a clearance to an aircraft in reaction to an E-MSAW alert to ensure that adjacent MIA areas are not a factor.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–6, Safety Alert.

b. The controller may suppress the display of an E-MSAW alert from his/her control position with the application of one of the following suppress/inhibit computer functions:

1. The specific alert suppression message may be used to inhibit the E-MSAW alerting display on a single flight for a specific alert.

2. The indefinite alert suppression message must be used exclusively to inhibit the display of E-MSAW alerts on aircraft known to be flying at an altitude that will activate the alert feature of one or more MIA areas within an ARTCC.

**NOTE–**

1. The indefinite alert suppression message will remain in effect for the duration of the referenced flight's active status within the ARTCC unless modified by controller action.

2. The indefinite alert suppression message would typically apply to military flights with clearance to fly low-level type routes that routinely require altitudes below established minimum IFR altitudes.

c. The computer entry of a message suppressing or inhibiting E-MSAW alerts constitutes acknowledgment for the alert and indicates that appropriate action has or will be taken to resolve the situation.

### 5–14–3. COMPUTER ENTRY OF FLIGHT PLAN INFORMATION

a. Altitude

1. The altitude field(s) of the data block must always reflect the current status of the aircraft unless otherwise specified in an appropriate facility directive.

2. Unless otherwise specified in a facility directive or letter of agreement, do not modify assigned or interim altitude information prior to establishing communication with an aircraft that is outside your area of jurisdiction unless verbal coordination identifying who will modify the data block has been accomplished.

**NOTE–**

1. A local interim altitude (LIA) can be used as a means of recording interfacility coordination.

2. Conflict probe in EDST does not probe for the LIA.

3. Whenever an aircraft is cleared to maintain an altitude different from that in the flight plan database, enter into the computer one of the following:

(a) The new assigned altitude if the aircraft will (climb or descend to and) maintain the new altitude, or

(b) An interim altitude if the aircraft will (climb or descend to and) maintain the new altitude for a short period of time and subsequently be recleared to the altitude in the flight plan database or a new altitude or a new interim altitude, or

**ERAM**

(c) A procedure altitude if the aircraft is cleared to vertically navigate (VNAV) on a SID/STAR with published restrictions, or

(d) Where appropriate for interfacility hand-offs, an LIA when the assigned altitude differs from the coordinated altitude unless verbally coordinated or specified in a letter of agreement or facility directive.

**NOTE–**

A facility directive may be published, in accordance with JO 7210.3, Paragraph 8-2-7, Waiver to Interim Altitude Requirements, deleting the interim altitude computer entry requirements of subpara 3(b).

**b. Flight Plan Route Data**

This information must not be modified outside of the controller's area of jurisdiction unless verbally coordinated or specified in a Letter of Agreement or Facility Directive.

## 5-14-4. ENTRY OF REPORTED ALTITUDE

Whenever Mode C altitude information is either not available or is unreliable, enter reported altitudes into the computer as follows:

**NOTE–**

Altitude updates are required to assure maximum accuracy in applying slant range correction formulas.

a. When an aircraft reaches the assigned altitude.

b. When an aircraft at an assigned altitude is issued a clearance to climb or descend.

c. A minimum of each 10,000 feet during climb to or descent from FL 180 and above.

## 5-14-5. SELECTED ALTITUDE LIMITS

The display of Mode C targets and limited data blocks is necessary for application of Merging Target Procedures. Sectors must ensure the display of Mode C targets and data blocks by entering appropriate altitude limits and display filters to include, as a minimum, the altitude stratum of the sector plus:

a. 1,200 feet above the highest and below the lowest altitude or flight level of the sector where 1,000 feet vertical separation is applicable; and

b. 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 data block, for purposes of this paragraph, must contain the Mode C altitude and call sign or beacon code at a minimum.

2. Exception to these requirements may be authorized for specific altitudes in certain ARTCC sectors if defined in appropriate facility directives and approved by the respective service area operations directorate.

**REFERENCE–**

FAA Order JO 7110.65, Para 5-1-2, Alignment Accuracy Check.

## 5-14-6. SECTOR ELIGIBILITY

The use of the OK function is allowed to override sector eligibility only when one of the following conditions is met:

a. Prior coordination is effected.

b. The flight is within the control jurisdiction of the sector.

## 5-14-7. COAST TRACKS

Do not use coast tracks in the application of either radar or nonradar separation criteria.

### 5-14-8. CONTROLLER INITIATED COAST TRACKS

a. Initiate coast tracks only in Flight Plan Aided Tracking (FLAT) mode, except “free” coast tracking may be used as a reminder that aircraft without corresponding computer-stored flight plan information are under your control.

#### NOTE–

1. To ensure tracks are started in FLAT mode, perform a start track function at the aircraft’s most current reported position, then immediately “force” the track into coast tracking by performing another start function with “CT” option in field 64. Making amendments to the stored route with trackball entry when the aircraft is rerouted, and repositioning the data block to coincide with the aircraft’s position reports are methods of maintaining a coast track in FLAT mode.

2. EBUS does not have the capability to initiate coast tracks.

b. Prior to initiating a coast track, ensure that a departure message or progress report corresponding with the aircraft’s current position is entered into the computer.

c. As soon as practicable after the aircraft is in radar surveillance, initiate action to cause radar tracking to begin on the aircraft.

### 5-14-9. ERAM COMPUTER ENTRY OF HOLD INFORMATION

a. When an aircraft is issued holding instructions, the delay is ATC initiated, and the EFC is other than “no delay expected:”

1. Enter a hold message.
2. Maintain a paired track.

3. Enter an EFC time via a hold message, the Hold Data Menu, or the Hold View.

4. Enter non-published holding instructions via a hold message or the Hold Data Menu.

#### NOTE–

*The ERAM hold message allows automatic calculation and reporting of aggregate delays.*

b. Unless otherwise specified in a facility directive, verbally coordinate non-published holding instructions when handing off an aircraft in hold status to another ERAM sector.

c. An EFC time entered into the Hold Data Menu, Hold View, or the hold message constitutes coordination of the EFC between ERAM sectors.

#### REFERENCE–

*FAA Order JO 7210.3, Para 8-2-9, ERAM Hold Information Facility Directive Requirements*

### 5-14-10. ERAM VISUAL INDICATOR OF SPECIAL ACTIVITY AIRSPACE (SAA) STATUS

Sector controllers shall ensure the situation display accurately reflects the status of all SAAs that impact their area of control responsibility. When “SAA DOWN” is displayed in the Outage View, manually create visual indicators on the situation display to reflect changes to airspace status.

#### NOTE–

*The “SAA DOWN” message in the Outage View means that SAA status is no longer being updated. The status of each SAA at the time of the failure, whether “on” or “off”, will continue to be displayed. Status changes will not be automatically updated on the display until the outage is resolved.*



## Section 15. Standard Terminal Automation Replacement System (STARS)–Terminal

### 5-15-1. APPLICATION

STARS may be used for identifying aircraft assigned a discrete beacon code, maintaining identity of targets, and performing handoffs of these targets between controllers. All procedures for the terminal domain related to air traffic control services using STARS apply to the FUSION target.

### 5-15-2. 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.

### 5-15-3. FUNCTIONAL USE

In addition to other uses specified herein, terminal automation may be used for the following functions:

- a. Tracking.
- b. Tagging.
- c. Handoff.
- d. Altitude information.

#### REFERENCE–

FAA Order JO 7110.65, Para 5-2-24, Altitude Filters.

- e. Coordination.
- f. Ground speed.
- g. Identification.

### 5-15-4. SYSTEM REQUIREMENTS

Use terminal automation systems as follows:

#### NOTE–

*Locally developed procedures, operating instructions, and training material are required because of differences in equipment capability. Such locally developed procedures must be supplemental to those contained in this section and must be designed to make maximum use of the ARTS equipment.*

a. Inform all appropriate positions before terminating or reinstating use of the terminal automation system at a control position. When terminating the

use of terminal automation systems, all pertinent flight data of that position must be transferred or terminated.

b. Inform other interfaced facilities of scheduled and unscheduled shutdowns.

c. Initiate a track/tag on all aircraft to the maximum extent possible. As a minimum, aircraft identification should be entered, and automated handoff functions should be used.

d. Assigned altitude, if displayed, must be kept current at all times. Climb and descent arrows, where available, must be used to indicate other than level flight.

e. When operating in FUSION mode, the assigned or pilot reported altitude must be displayed and kept current when the aircraft is in level flight.

f. The automatic altitude readout of an aircraft under another controller's jurisdiction may be used for vertical separation purposes without verbal coordination provided:

1. Operation is conducted using single-site radar coverage or when operating in FUSION mode.

2. Prearranged coordination procedures are contained in a facility directive in accordance with Paragraph 5-4-9, Prearranged Coordination, and FAA Order JO 7210.3, Paragraph 3-7-7, Prearranged Coordination.

3. Do not use Mode C to effect vertical separation within a Mosaic radar configuration.

### 5-15-5. INFORMATION DISPLAYED

a. Two-letter ICAO designators or three-letter designators, as appropriate, must be used unless program limitations dictate the use of a single letter alpha prefix.

b. Use of the inhibit/select functions to remove displayed information no longer required must be in accordance with local directives, which should ensure maximum required use of the equipment.

c. Information displayed must be in accordance with national orders and specified in local directives.

**5-15-6. CA/MCI**

a. When a CA or MCI alert is displayed, evaluate the reason for the alert without delay and take appropriate action.

**REFERENCE-**

*FAA Order JO 7110.65, Para 2-1-6, Safety Alert.*

b. 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.

c. Suppressing/Inhibiting CA/MCI alert.

1. The suppress function may be used to suppress the display of a specific CA/MCI alert.

2. The inhibit function must only be used to inhibit the display of CA for aircraft routinely engaged in operations where approved separation criteria do not apply.

**NOTE-**

*Examples of operations where approved separation criteria do not apply are ADC practice intercept operations and air shows.*

3. Computer entry of a message suppressing a CA/MCI alert constitutes acknowledgment for the alert and signifies that appropriate action has or will be taken.

4. CA/MCI alert may not be suppressed or inhibited at or for another control position without being coordinated.

**5-15-7. INHIBITING MINIMUM SAFE ALTITUDE WARNING (MSAW)**

a. Inhibit MSAW processing of VFR aircraft and aircraft that cancel instrument flight rules (IFR) flight plans unless the pilot specifically requests otherwise.

**REFERENCE-**

*FAA Order JO 7110.65, Para 10-2-7, VFR Aircraft in Weather Difficulty.*

*FAA Order JO 7110.65, Para 10-2-8, Radar Assistance to VFR Aircraft in Weather Difficulty.*

b. A low altitude alert may be suppressed from the control position. Computer entry of the suppress message constitutes an acknowledgment for the alert and indicates that appropriate action has or will be taken.

**5-15-8. TRACK SUSPEND FUNCTION**

Use the track suspend function only when data block overlap in holding patterns or in proximity of the final approach create an unworkable situation. If necessary to suspend tracks, those which are not displaying automatic altitude readouts must be suspended. If the condition still exists, those displaying automatic altitude readouts may then be suspended.

## Section 7. North Atlantic ICAO Region

### 8-7-1. APPLICATION

Provide air traffic control services in the North Atlantic ICAO Region with the procedures and minima contained in this section except when noted otherwise.

### 8-7-2. VERTICAL SEPARATION

Provide vertical separation in accordance with Chapter 4, IFR, Section 5, Altitude Assignment and Verification.

### 8-7-3. LONGITUDINAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 3, Longitudinal Separation, apply the following:

#### a. Supersonic flight:

##### 1. 10 minutes provided that:

(a) both aircraft are in level flight at the same Mach number or the aircraft are of the same type and are both operating in cruise climb, and one of the following;

(1) The aircraft concerned have reported over a common point; or,

(2) If the aircraft have not reported over a common point, the appropriate time interval being applied between aircraft exists and will exist at the common point; or,

(3) If a common point does not exist, the appropriate time interval being applied between aircraft exists and will exist at significant points along each track.

2. 15 minutes between aircraft in supersonic flight not covered in subpara a1 above.

#### b. Turbojet operations (*subsonic flight*):

1. Apply the prescribed minima in accordance with Paragraph 8-3-3, Mach Number Technique; or

2. Where tracks diverge from the common point and the following aircraft is maintaining a greater Mach Number than the preceding aircraft:

(a) At least 10 minutes longitudinal separation exists at the point where the tracks diverge; and

(b) At least 5 minutes longitudinal separation will exist where minimum lateral separation is achieved (*whichever is estimated to occur first*);

(1) At or before the next significant point (normally within ten degrees of longitude along track(s)), or

(2) Within 90 minutes of the time the following aircraft passes the common point, or

(3) Within 600 NM of the common point.

3. Apply 15 minutes between all other turbojet aircraft.

#### c. Nonturbojet operations:

1. Apply 20 minutes between aircraft operating in the West Atlantic Route System (WATRS), or

2. Apply 30 minutes between aircraft operating outside of the WATRS.

#### NOTE-

The WATRS area is defined as beginning at a point 27°00'N/77°00'W direct to 20°00'N/67°00'W direct to 18°00'N/62°00'W direct to 18°00'N/60°00'W direct to 38°30'N/60°00'W direct to 38°30'N/69°15'W, thence counterclockwise along the New York Oceanic CTA/FIR boundary to the Miami Oceanic CTA/FIR boundary, thence southbound along the Miami Oceanic CTA/FIR boundary to the point of beginning.

d. Clear an aircraft for an ADS-B In Trail Procedure (ITP) climb or descent provided the following conditions are satisfied:

1. The ITP climb or descent has been requested by the pilot;

2. The aircraft identification of each reference aircraft in the ITP request exactly matches the Item 7 - aircraft identification of the corresponding aircraft's filed flight plan;

3. The reported ITP distance between the ITP aircraft and any reference aircraft is 15 NM or more;

4. Both the ITP aircraft and reference aircraft are either on:

(a) same identical tracks and any turn at a waypoint shall be limited to less than 45 degrees; or

(b) same tracks with no turns permitted that reduce required separation during the ITP.

**NOTE–**

*Same identical tracks are where the angular difference is zero degrees.*

5. No speed or route change clearance shall be issued to the ITP aircraft until the ITP climb or descent is completed;

6. The altitude difference between the ITP aircraft and any reference aircraft shall be 2000 ft or less;

7. No instruction to amend speed, altitude or route shall be issued to any reference aircraft until the ITP climb or descent is completed;

8. The maximum closing speed between the ITP aircraft and each reference aircraft shall be Mach 0.06; and

9. The ITP aircraft shall not be a reference aircraft in another ITP clearance.

**NOTE–**

*ATOP is designed to check for the above criteria prior to allowing the minima to be provided.*

e. Minima based on distance using Automatic Dependent Surveillance – Contract (ADS-C):

1. Apply the minima as specified in TBL 8–7–1 between aircraft on the same track within airspace designated for Required Navigation Performance (RNP), provided:

(a) Direct controller/pilot communication via voice or Controller Pilot Data Link Communications (CPDLC) is established, and

(b) The required ADS-C periodic reports are maintained and monitored by an automated flight data processor (for example, ATOP).

**TBL 8–7–1  
ADS–C Criteria**

Minima				
Standard	RNP	RCP See Note 1	RSP See Note 2	Maximum ADS-C Periodic Reporting Interval
50 NM	10	240	180	27 minutes
50 NM	4	240	180	32 minutes
30 NM	4	240	180	10 minutes

**NOTE–**

1. *Required Communication Performance (RCP).*

2. *Required Surveillance Performance (RSP).*

2. Aircraft on reciprocal tracks may be cleared to climb or descend to or through the altitude(s) occupied by another aircraft provided:

(a) An ADS-C position report on at least one of the aircraft has been received beyond the passing point, and

(b) The aircraft have passed each other by the applicable separation minimum.

**NOTE–**

*ATOP has been designed to check for the above criteria prior to allowing the minima to be provided.*

3. When an ADS-C periodic or waypoint change event report is overdue by 3 minutes, the controller must take action to obtain an ADS-C report.

4. If no report is received within 6 minutes of the time the original report was due, the controller must take action to apply another form of separation.

5. Aircraft on the same track may be cleared to climb or descend through the level of another aircraft provided:

(a) The longitudinal distance between the aircraft is determined from near simultaneous ADS–C demand reports and the ATOP software is used to ensure the following conditions are met;

(b) The longitudinal distance between the aircraft, as determined in a) above, is not less than:

(1) 15 NM when the preceding aircraft is at the same speed or faster than the following aircraft; or

(2) 25 NM when the following aircraft is not more than Mach 0.02 faster than the preceding aircraft

(c) The altitude difference between aircraft is not more than 2000 ft;

(d) The clearance is for a climb or descent of 4000 ft or less;

(e) Both aircraft are filed as single flights not flying in formation with other aircraft;

(f) Both aircraft are in level flight at a single altitude;

(g) Both aircraft are same direction;

(h) Neither aircraft are on a weather deviation;

(i) Neither aircraft have an open CPDLC request for a weather deviation;

(j) Neither aircraft are on an offset with a rejoin clearance; and

(k) The clearance is issued with a restriction that ensures vertical separation is re-established within 15 minutes from the first demand report request.

### 8-7-4. LATERAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 4, Lateral Separation, apply the following:

a. 30 NM to (at a minimum, RNP-4, RCP 240, and RSP 180) approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

b. 50 NM between Required Navigation Performance (RNP 4 or RNP 10) approved aircraft which:

1. Operate on routes or in areas within WATRS, the San Juan CTA/FIR or the Atlantic portion of the Miami Oceanic CTA/FIR; or

2. Operate in the New York Oceanic CTA/FIR outside of WATRS.

#### NOTE-

*This reduced lateral separation must not be used if track-keeping capability of the aircraft has been reduced for any reason.*

c. 60 NM or 1 degree latitude between:

1. Supersonic aircraft operating above FL 275.

2. Aircraft which have MNPS or NAT HLA authorization and which:

(a) Operate within NAT HLA; or

(b) Are in transit to or from NAT HLA; or

(c) Operate for part of their flight within, above, or below NAT HLA.

#### NOTE-

*This reduced lateral separation must not be used if*

*track-keeping capability of the aircraft has been reduced for any reason.*

d. 90 NM or 1 and 1/2 degrees latitude between aircraft not approved for RNP 4 or RNP 10 and which:

1. Operate on routes or in areas within WATRS, the San Juan CTA/FIR or the Atlantic portion of the Miami CTA/FIR;

2. Operate between points in the U.S. or Canada, and Bermuda;

3. Operate west of 55° West between the U.S., Canada, or Bermuda and points in the Caribbean ICAO Region.

e. 120 NM or 2 degrees latitude between aircraft not covered by subparas a, c or d above.

#### NOTE-

*Tracks may be spaced with reference to their difference in latitude, provided that in any interval of 10 degrees of longitude the change in latitude of at least one of the tracks does not exceed 3 degrees when operating south of 58° North.*

### 8-7-5. PROCEDURES FOR WEATHER DEVIATIONS IN NORTH ATLANTIC (NAT) AIRSPACE

Aircraft must request an ATC clearance to deviate. Since aircraft will not fly into known areas of weather, weather deviation requests should take priority over routine requests. If there is no traffic in the horizontal dimension, ATC must issue clearance to deviate from track; or if there is conflicting traffic in the horizontal dimension, ATC separates aircraft by establishing vertical separation. If there is conflicting traffic and ATC is unable to establish the required separation, ATC must:

a. Advise the pilot unable to issue clearance for requested deviation;

b. Advise the pilot of conflicting traffic; and

c. Request pilot's intentions.

#### PHRASEOLOGY-

*UNABLE (requested deviation), TRAFFIC IS (call sign, position, altitude, direction), ADVISE INTENTIONS.*

#### NOTE-

1. The pilot will advise ATC of intentions by the most expeditious means available.

*2. In the event that pilot/controller communications cannot be established or a revised ATC clearance is not available, pilots will follow the procedures outlined in the Regional Supplementary Procedures, ICAO Doc. 7030.*

## Section 8. Caribbean ICAO Region

### 8-8-1. APPLICATION

Provide air traffic control services in the Caribbean ICAO Region with the procedures and minima contained in this section except when noted otherwise.

### 8-8-2. VERTICAL SEPARATION

Provide vertical separation in accordance with Chapter 4, IFR, Section 5, Altitude Assignment and Verification.

### 8-8-3. LONGITUDINAL SEPARATION

Provide longitudinal separation between aircraft as follows:

#### a. Supersonic flight:

1. *10 minutes* provided both aircraft are in level flight at the same Mach number or the aircraft are of the same type and are both operating in cruise climb, and one of the following;

(a) Both aircraft have reported over a common point; or,

(b) If both aircraft have not reported over a common point, the appropriate time interval being applied between aircraft exists and will exist at the common point; or,

(c) If a common point does not exist, the appropriate time interval being applied between aircraft exists and will exist at significant points along each track.

2. *15 minutes* between all other aircraft.

b. Turbojet operations at or above FL 200 in the Miami Oceanic, Houston Oceanic and San Juan CTAs/FIRs and all altitudes in the West Atlantic Route System (WATRS) and New York Oceanic CTA/FIR (*subsonic flight*):

1. Apply the prescribed minima in accordance with Paragraph 8-3-3, Mach Number Technique; or

2. In the New York CTA/FIR, where tracks diverge from the common point and the following aircraft is maintaining a greater Mach number than the preceding aircraft:

(a) At least *10 minutes* longitudinal separation exists at the point where the tracks diverge; and

(b) At least *5 minutes* longitudinal separation will exist where minimum lateral separation is achieved (*whichever is estimated to occur first*);

(1) At or before the next significant point (normally within ten degrees of longitude along track(s)), or

(2) Within *90 minutes* of the time the following aircraft passes the common point, or

(3) Within *600 NM* of the common point; or

3. Apply *15 minutes* between all other turbojet aircraft.

c. Turbojet operations below FL 200 (*subsonic flight*):

Apply *20 minutes* between turbojet aircraft operating below FL 200 in the San Juan Oceanic (*outside the WATRS area*), Miami Oceanic and Houston Oceanic CTAs/FIRs.

d. Nonturbojet operations.

1. Apply *20 minutes* between aircraft operating in the WATRS; or

2. Apply *20 minutes* between aircraft operating below FL 200 in the Miami Oceanic, Houston Oceanic and San Juan CTAs/FIRs; or

3. Apply *30 minutes* between aircraft operating outside of the WATRS in the New York CTA/FIR.

#### NOTE-

*The WATRS area is defined as beginning at a point 27°00'N/77°00'W direct to 20°00'N/67°00'W direct to 18°00'N/62°00'W direct to 18°00'N/60°00'W direct to 38°30'N/60°00'W direct to 38°30'N/69°15'W, thence counterclockwise along the New York Oceanic CTA/FIR boundary to the Miami Oceanic CTA/FIR boundary, thence southbound along the Miami Oceanic CTA/FIR boundary to the point of beginning.*

e. Clear an aircraft for an ADS-B In Trail Procedure (ITP) climb or descent provided the following conditions are satisfied:

1. The ITP climb or descent has been requested by the pilot;

2. The aircraft identification of each reference aircraft in the ITP request exactly matches the Item 7 - aircraft identification of the corresponding aircraft's filed flight plan;

3. The reported ITP distance between the ITP aircraft and any reference aircraft is 15 NM or more;

4. Both the ITP aircraft and reference aircraft are either on:

(a) same identical tracks and any turn at a waypoint shall be limited to less than 45 degrees; or

(b) same tracks with no turns permitted that reduce required separation during the ITP.

**NOTE–**

*Same identical tracks are where the angular difference is zero degrees.*

5. No speed or route change clearance shall be issued to the ITP aircraft until the ITP climb or descent is completed;

6. The altitude difference between the ITP aircraft and any reference aircraft shall be 2000 ft or less;

7. No instruction to amend speed, altitude or route shall be issued to any reference aircraft until the ITP climb or descent is completed;

8. The maximum closing speed between the ITP aircraft and each reference aircraft shall be Mach 0.06; and

9. The ITP aircraft shall not be a reference aircraft in another ITP clearance.

**NOTE–**

*ATOP is designed to check for the above criteria prior to allowing the minima to be provided.*

f. Minima based on distance using Automatic Dependent Surveillance – Contract (ADS-C):

1. Apply the minima as specified in TBL 8–8–1 between aircraft on the same track within airspace designated for Required Navigation Performance (RNP), provided:

(a) Direct controller/pilot communication via voice or Controller Pilot Data Link Communications (CPDLC) is established, and

(b) The required ADS-C periodic reports are maintained and monitored by an automated flight data processor (for example, ATOP).

**TBL 8–8–1  
ADS–C Criteria**

Minima				
Standard	RNP	RCP	RSP	Maximum ADS-C Periodic Reporting Interval
50 NM	10	240	180	27 minutes
50 NM	4	240	180	32 minutes
30 NM	4	240	180	10 minutes

2. Aircraft on reciprocal tracks may be cleared to climb or descend to or through the altitude(s) occupied by another aircraft provided:

(a) An ADS-C position report on at least one of the aircraft has been received beyond the passing point, and

(b) The aircraft have passed each other by the applicable separation minimum.

**NOTE–**

*ATOP has been designed to check for the above criteria prior to allowing the minima to be provided.*

3. When an ADS-C periodic or waypoint change event report is overdue by 3 minutes, the controller must take action to obtain an ADS-C report.

4. If no report is received within 6 minutes of the time the original report was due, the controller must take action to apply another form of separation.

5. Aircraft on the same track may be cleared to climb or descend through the level of another aircraft provided:

(a) The longitudinal distance between the aircraft is determined from near simultaneous ADS–C demand reports and the ATOP software is used to ensure the following conditions are met;

(b) The longitudinal distance between the aircraft, as determined in a) above, is not less than:

(1) 15 NM when the preceding aircraft is at the same speed or faster than the following aircraft; or

(2) 25 NM when the following aircraft is not more than Mach 0.02 faster than the preceding aircraft

(c) The altitude difference between aircraft is not more than 2000 ft;

(d) The clearance is for a climb or descent of 4000 ft or less;

(e) Both aircraft are filed as single flights not flying in formation with other aircraft;

(f) Both aircraft are in level flight at a single altitude;

(g) Both aircraft are same direction;

(h) Neither aircraft are on a weather deviation;

(i) Neither aircraft have an open CPDLC request for a weather deviation;

(j) Neither aircraft are on an offset with a rejoin clearance; and

(k) The clearance is issued with a restriction that ensures vertical separation is re-established within 15 minutes from the first demand report request.

#### 8-8-4. LATERAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 4, Lateral Separation, apply the following:

**a.** 30 NM to (at a minimum, RNP-4, RCP 240, and RSP 180) approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**b.** 50 NM between Required Navigation Performance (RNP 4 or RNP 10) approved aircraft which:

**1.** Operate on routes or in areas within WATRS, the San Juan CTA/FIR or the Atlantic portion of the Miami Oceanic CTA/FIR; or

**2.** Operate in the New York Oceanic CTA/FIR outside of WATRS; or

**3.** Operate in the Houston Oceanic CTA/FIR or the Gulf of Mexico portion of the Miami CTA/FIR.

#### NOTE-

*This reduced lateral separation must not be used if track-keeping capability of the aircraft has been reduced for any reason.*

**c.** 60 NM between:

**1.** Supersonic aircraft operating above FL 275 within the New York oceanic CTA/FIR.

**2.** Supersonic aircraft operating at or above FL 450 not covered in subpara 1 above.

**3.** Aircraft which have MNPS or NAT HLA authorization and which:

**(a)** Operate within NTA HLA; or

**(b)** Are in transit to or from NAT HLA; or

**(c)** Operate for part of their flight within, above, or below NAT HLA.

#### NOTE-

*This reduced lateral separation must not be used if track-keeping capability of the aircraft has been reduced for any reason.*

**d.** 90 NM between aircraft not approved for RNP 4 or RNP 10 and which:

**1.** Operate within WATRS; or

**2.** Operate west of 55° West between the U.S., Canada, or Bermuda and points in the Caribbean ICAO Region.

**e.** 100 NM between aircraft operating west of 55° West not covered by subparas a, c or d above.

**f.** 120 NM between aircraft operating east of 55° West.

#### 8-8-5. VFR CLIMB AND DESCENT

**a.** In the Houston, Miami, and San Juan CTAs, IFR flights may be cleared to climb and descend in VFR conditions only:

**1.** When requested by the pilot; and

**2.** Between sunrise and sunset.

**b.** Apply the following when the flight is cleared:

**1.** If there is a possibility that VFR conditions may become impractical, issue alternative instructions.

**2.** Issue traffic information to aircraft that are not separated in accordance with the minima in this section.



## Section 9. Pacific ICAO Region

### 8-9-1. APPLICATION

Provide air traffic control services in the Pacific ICAO Region with the procedures and minima contained in this section except when noted otherwise.

### 8-9-2. VERTICAL SEPARATION

Provide vertical separation in accordance with Chapter 4, IFR, Section 5, Altitude Assignment and Verification.

### 8-9-3. LONGITUDINAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 3, Longitudinal Separation, apply the following:

#### a. Minima based on time:

1. *15 minutes* between aircraft; or
2. *10 minutes* between turbojet aircraft whether in level, climbing or descending flight, provided that the aircraft concerned follow the same track or continuously diverging tracks until some other form of separation is provided; or
3. The prescribed minima in accordance with Para 8-3-3, Mach Number Technique.
4. Reciprocal track aircraft – Where lateral separation is not provided, vertical separation must be provided at least *10 minutes* before and after the time the aircraft are estimated to pass or are estimated to have passed.

b. Clear an aircraft for an ADS-B In Trail Procedure (ITP) climb or descent provided the following conditions are satisfied:

1. The ITP climb or descent has been requested by the pilot;
2. The aircraft identification of each reference aircraft in the ITP request exactly matches the Item 7 - aircraft identification of the corresponding aircraft's filed flight plan;

3. The reported ITP distance between the ITP aircraft and any reference aircraft is 15 NM or more;

4. Both the ITP aircraft and reference aircraft are either on:

(a) Same identical tracks and any turn at a waypoint shall be limited to less than 45 degrees; or

(b) same tracks with no turns permitted that reduce required separation during the ITP.

#### NOTE-

*Same identical tracks are where the angular difference is zero degrees.*

5. No speed or route change clearance shall be issued to the ITP aircraft until the ITP climb or descent is completed;

6. The altitude difference between the ITP aircraft and any reference aircraft shall be 2000 ft or less;

7. No instruction to amend speed, altitude or route shall be issued to any reference aircraft until the ITP climb or descent is completed;

8. The maximum closing speed between the ITP aircraft and each reference aircraft shall be Mach 0.06; and

9. The ITP aircraft shall not be a reference aircraft in another ITP clearance.

#### NOTE-

*ATOP is designed to check for the above criteria prior to allowing the minima to be provided.*

c. Minima based on distance using Automatic Dependent Surveillance – Contract (ADS-C):

1. Apply the minima as specified in TBL 8-9-1, ADS-C Criteria, between aircraft on the same track within airspace designated for Required Navigation Performance (RNP), provided:

(a) Direct controller/pilot communication via voice or Controller Pilot Data Link Communications (CPDLC) is established, and

(b) The required ADS-C periodic reports are maintained and monitored by an automated flight data processor (e.g., ATOP);

**TBL 8-9-1**  
**ADS-C Criteria**

<b>Minima</b>				
<b>Standard</b>	<b>RNP</b>	<b>RCP</b>	<b>RSP</b>	<b>Maximum ADS-C Periodic Reporting Interval</b>
50 NM	10	240	180	27 minutes
50 NM	4	240	180	32 minutes
30 NM	4	240	180	10 minutes

**2.** Aircraft on reciprocal tracks may be cleared to climb or descend to or through the altitude(s) occupied by another aircraft provided that:

(a) An ADS-C position report on at least one of the aircraft has been received beyond the passing point, and

(b) The aircraft have passed each other by the applicable separation minimum.

**NOTE–**

*ATOP has been designed to check for the above criteria prior to allowing the minima to be provided.*

**3.** When an ADS-C periodic or waypoint change event report is overdue by *3 minutes*, the controller must take action to obtain an ADS-C report.

**4.** If no report is received within *6 minutes* of the time the original report was due, the controller must take action to apply another form of separation.

**5.** Aircraft on the same track may be cleared to climb or descend through the level of another aircraft provided:

(a) The longitudinal distance between the aircraft is determined from near simultaneous ADS-C demand reports and the ATOP software is used to ensure the following conditions are met;

(b) The longitudinal distance between the aircraft, as determined in a) above, is not less than:

(1) 15 NM when the preceding aircraft is at the same speed or faster than the following aircraft; or

(2) 25 NM when the following aircraft is not more than Mach 0.02 faster than the preceding aircraft

(c) The altitude difference between aircraft is not more than 2000 ft;

(d) The clearance is for a climb or descent of 4000 ft or less;

(e) Both aircraft are filed as single flights not flying in formation with other aircraft;

(f) Both aircraft are in level flight at a single altitude;

(g) Both aircraft are same direction;

(h) Neither aircraft are on a weather deviation;

(i) Neither aircraft have an open CPDLC request for a weather deviation;

(j) Neither aircraft are on an offset with a rejoin clearance; and

(k) The clearance is issued with a restriction that ensures vertical separation is re-established within 15 minutes from the first demand report request.

**d. Minima based on distance *without* ADS-C:**

**1.** Apply *50 NM* between aircraft cruising, climbing or descending on the same track or reciprocal track that meet the requirements for and are operating within airspace designated for RNP-10 operations provided:

(a) Direct controller/pilot communication via voice or CPDLC is maintained; and

(b) Separation is established by ensuring that at least *50 NM* longitudinal separation minima exists between aircraft positions as reported by reference to the same waypoint.

(1) *Same track aircraft* – whenever possible ahead of both; or

(2) *Reciprocal track aircraft* – provided that it has been positively established that the aircraft have passed each other.

**2.** Distance verification must be obtained from each aircraft at least every *24 minutes* to verify that separation is maintained.

**3.** If an aircraft fails to report its position within *3 minutes* after the expected time, the controller must take action to establish communication. If communication is not established within *8 minutes* after the time the report should have been received, the

controller must take action to apply another form of separation.

**NOTE—**

*When same track aircraft are at, or are expected to reduce to, the minima, speed control techniques should be applied in order to maintain the required separation.*

**e. Minima based on DME/RNAV:**

Apply the following DME/RNAV minima in Control 1234H, Control 1487H and the Norton Sound High Control areas to turbojet aircraft established on or transitioning to the North Pacific (NOPAC) Route System.

**1.** 30 NM between aircraft when DME reports or radar observations are used to establish the distance, otherwise at least 40 NM based on RNAV must be applied; and

**2.** Unless both aircraft are radar identified, both aircraft must provide DME/RNAV distance reports via direct voice that indicates the appropriate separation exists; and

**3.** Application of DME/RNAV separation without direct voice communications may not continue for more than 90 minutes; and

**4.** The preceding aircraft is assigned the same or greater Mach number than the following aircraft; and

**5.** Both aircraft must be advised of the other aircraft involved, including the distance relative to the flights.

**EXAMPLE—**

*“Maintain Mach point eight four, same direction traffic, twelve o’clock, three five miles.”*

**REFERENCE—**

FAA Order JO 7110.65, Para 2–1–21, Traffic Advisories.

## 8–9–4. LATERAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 4, Lateral Separation, apply the following:

**a.** Within areas where Required Navigation Performance 10 (RNP–10) separation and proced-

ures are authorized, apply 50 NM to RNP–10 approved aircraft.

**b.** Apply 30 NM to (at a minimum, RNP–4, RCP 240, and RSP 180) approved aircraft operating within airspace designated for RNP–4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS–C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**c.** Apply 100 NM to aircraft not covered by subparagraphs a and b.

## 8–9–5. PROCEDURES FOR WEATHER DEVIATIONS AND OTHER CONTINGENCIES IN OCEANIC CONTROLLED AIRSPACE

Aircraft must request an ATC clearance to deviate. Since aircraft will not fly into known areas of weather, weather deviation requests should take priority over routine requests. If there is no traffic in the horizontal dimension, ATC must issue clearance to deviate from track; or if there is conflicting traffic in the horizontal dimension, ATC separates aircraft by establishing vertical separation. If there is conflicting traffic and ATC is unable to establish approved separation, ATC must:

**a.** Advise the pilot unable to issue clearance for requested deviation;

**b.** Advise the pilot of conflicting traffic; and

**c.** Request pilot’s intentions.

**PHRASEOLOGY—**

UNABLE (requested deviation), TRAFFIC IS (call sign, position, altitude, direction), SAY INTENTIONS.

**NOTE—**

**1.** The pilot will advise ATC of intentions by the most expeditious means available.

**2.** In the event that pilot/controller communications cannot be established or a revised AT clearance is not available, pilots will follow the procedures outlined in the Regional Supplementary Procedures, ICAO Doc 7030 and Chart Supplements.



## Section 10. North American ICAO Region

### 8-10-1. APPLICATION

Provide air traffic control services in the North American ICAO Region with the procedures and minima contained in this section.

### 8-10-2. VERTICAL SEPARATION

Provide vertical separation in accordance with:

- a. Chapter 4, IFR, Section 5, Altitude Assignment and Verification; and
- b. Facility directives depicting the transition between flight levels and metric altitudes.

### 8-10-3. LONGITUDINAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 3, Longitudinal Separation, apply the following:

- a. Minima based on time:
  - 1. 15 minutes between turbojet aircraft.
  - 2. The prescribed minima in accordance with Paragraph 8-3-3, Mach Number Technique.
  - 3. 20 minutes between other aircraft.
- b. Clear an aircraft for an ADS-B In Trail Procedure (ITP) climb or descent provided the following conditions are satisfied:
  - 1. The ITP climb or descent has been requested by the pilot;
  - 2. The aircraft identification of each reference aircraft in the ITP request exactly matches the Item 7 - aircraft identification of the corresponding aircraft's filed flight plan;
  - 3. The reported ITP distance between the ITP aircraft and any reference aircraft is 15 NM or more;
  - 4. Both the ITP aircraft and reference aircraft are either on:
    - (a) same identical tracks and any turn at a waypoint shall be limited to less than 45 degrees; or

- (b) same tracks with no turns permitted that reduce required separation during the ITP.

**NOTE-**

*Same identical tracks are where the angular difference is zero degrees.*

- 5. No speed or route change clearance shall be issued to the ITP aircraft until the ITP climb or descent is completed;

- 6. The altitude difference between the ITP aircraft and any reference aircraft shall be 2000 ft or less;

- 7. No instruction to amend speed, altitude or route shall be issued to any reference aircraft until the ITP climb or descent is completed;

- 8. The maximum closing speed between the ITP aircraft and each reference aircraft shall be Mach 0.06; and

- 9. The ITP aircraft shall not be a reference aircraft in another ITP clearance.

**NOTE-**

*ATOP is designed to check for the above criteria prior to allowing the minima to be provided.*

- c. Minima based on distance using Automatic Dependent Surveillance – Contract (ADS-C) in the Anchorage Oceanic and Anchorage Continental CTAs only:

**NOTE-**

*The minima described in this paragraph are not applicable within airspace in the Anchorage Arctic CTA.*

- 1. Apply the minima as specified in TBL 8-10-1 between aircraft on the same track within airspace in the Anchorage Oceanic and Anchorage Continental CTAs designated for Required Navigation Performance (RNP), provided:

- (a) Direct controller/pilot communication via voice or Controller Pilot Data Link Communications (CPDLC) is established, and

- (b) The required ADS-C periodic reports are maintained and monitored by an automated flight data processor (for example, ATOP).

**TBL 8-10-1**  
**ADS-C Criteria**

<b>Minima</b>				
<b>Standard</b>	<b>RNP</b>	<b>RCP</b>	<b>RSP</b>	<b>Maximum ADS-C Periodic Reporting Interval</b>
50 NM	10	240	180	27 minutes
50 NM	4	240	180	32 minutes
30 NM	4	240	180	10 minutes

**2.** Aircraft on reciprocal tracks in the Anchorage Oceanic and Anchorage Continental CTAs may be cleared to climb or descend to or through the altitude(s) occupied by another aircraft provided:

(a) An ADS-C position report on at least one of the aircraft has been received beyond the passing point, and

(b) The aircraft have passed each other by the applicable separation minimum.

**NOTE—**

*ATOP has been designed to check for the above criteria prior to allowing the minima to be provided.*

**3.** When an ADS-C periodic or waypoint change event report is overdue by *3 minutes*, the controller must take action to obtain an ADS-C report.

**4.** If no report is received within *6 minutes* of the time the original report was due, the controller must take action to apply another form of separation.

**5.** Aircraft on the same track may be cleared to climb or descend through the level of another aircraft provided:

(a) The longitudinal distance between the aircraft is determined from near simultaneous ADS-C demand reports and the ATOP software is used to ensure the following conditions are met;

(b) The longitudinal distance between the aircraft, as determined in a) above, is not less than:

(1) 15 NM when the preceding aircraft is at the same speed or faster than the following aircraft; or

(2) 25 NM when the following aircraft is not more than Mach 0.02 faster than the preceding aircraft.

(c) The altitude difference between aircraft is not more than 2000 ft;

(d) The clearance is for a climb or descent of 4000 ft or less;

(e) Both aircraft are filed as single flights not flying in formation with other aircraft;

(f) Both aircraft are in level flight at a single altitude;

(g) Both aircraft are same direction;

(h) Neither aircraft are on a weather deviation;

(i) Neither aircraft have an open CPDLC request for a weather deviation;

(j) Neither aircraft are on an offset with a rejoin clearance; and

(k) The clearance is issued with a restriction that ensures vertical separation is re-established within 15 minutes from the first demand report request.

#### **8-10-4. LATERAL SEPARATION**

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 4, Lateral Separation, apply the following:

**a.** 50 NM to RNP-10 approved aircraft within areas where RNP-10 separation and procedures are authorized,

**b.** 30 NM to (at a minimum, RNP-4, RCP 240, and RSP 180) approved aircraft operating within the Anchorage Oceanic CTA and Anchorage Continental CTA when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (for example, ATOP).

**NOTE—**

*The minimum described in subparagraph b is not applicable within airspace in the Anchorage Arctic CTA.*

**c.** 90 NM to aircraft not covered by subparagraphs a or b.

## Section 3. Special Use, ATC–Assigned Airspace, and Stationary ALTRVs

### 9–3–1. APPLICATION

Apply the procedures in this section to aircraft operating in proximity to special use, ATC-assigned airspace (ATCAA), and stationary ALTRVs 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.*

**REFERENCE–**

*P/CG Term– Special Use Airspace.*

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/warning area, MOA, ATCAA, or stationary ALTRV has been released to the controlling agency.

d. The aircraft is on an approved ALTRV, unless the airspace area in question is an ATCAA.

**NOTE–**

*Mission project officers are responsible for obtaining approval for ALTRV operations within prohibited/restricted/warning areas, MOAs, and stationary ALTRVs.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 9–3–4, Transiting Active SUA/ATCAA.*

e. Operations in special use airspace and stationary ALTRVs located in offshore/oceanic airspace will be conducted in accordance with the procedures in Chapter 8, Offshore/Oceanic Procedures.

### 9–3–2. SEPARATION MINIMA

Unless clearance of nonparticipating aircraft in/through/adjacent to a prohibited/restricted/warning area/MOA/ATCAA/stationary ALTRV is provided for in a letter of agreement (LOA) or letter of procedure (LOP), separate nonparticipating aircraft from active special use airspace, ATCAAs, and stationary ALTRVs by the following minima:

**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, ATCAA, or stationary ALTRV. VFR traffic is not prohibited from transiting stationary ALTRVs or transitional hazard areas (THA).*

a. Assign an altitude consistent with Paragraph 4–5–2, Flight Direction, and 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/warning area/MOA/ATCAA/stationary ALTRV.

**REFERENCE–**

*FAA Order JO 7210.3, Para 2-1-18, Prohibited/Restricted Areas and Stationary ALTRVs*

b. Provide radar separation of 3 miles (FL 600 and above – 6 miles) from the special use airspace, ATCAA, or stationary ALTRV peripheral boundary. EXCEPTIONS:

1. Some prohibited/restricted/warning areas are established for security reasons or to contain hazardous activities not involving aircraft operations. Where facility management has identified these areas as outlined in FAA Order JO 7210.3, Facility Operation and Administration, vector aircraft to remain clear of the peripheral boundary.

2. For stationary ALTRVs issued for the purpose of space launch or reentry operations, ensure aircraft remain clear of the peripheral boundary.

c. Clear aircraft on airways or routes whose widths or protected airspace do not overlap the peripheral boundary.

d. For stationary ALTRVs and temporary flight restrictions (TFR) issued for the purpose of space launch or reentry operations to protect aircraft hazard areas (AHA):

1. Do not allow nonparticipating aircraft to operate in an AHA unless real-time notifications of the actual start of activity and end of activity of the AHA is provided to affected facilities via ATCSCC coordination.

2. Do not provide ATC services to aircraft at airports that lie within an AHA unless real-time notifications of the actual start of activity and end of

activity of the AHA is provided to affected facilities via ATCSCC coordination.

**REFERENCE–**

FAA Order JO 7210.3, Para 20–6–4, Airports within Aircraft Hazard Areas and Transitional Hazard Areas.

**e.** For NOTAMs issued for the purpose of space launch or reentry operations to protect THAs:

**1.** Aircraft may enter provided they are not holding, loitering, or hovering, and are cleared on:

**(a)** Routing approved by the ATCSCC that has an angular difference of 30 through 150 degrees from the launch/reentry course, or

**(b)** Crossing courses that have an angular difference of 45 through 135 degrees from the launch/reentry course.

**NOTE–**

*The intent is to provide a crossing angle that accounts for the effects of wind.*

**REFERENCE–**

FAA Order JO 7110.65, Para 1–2–2, Course Definitions.

**2.** Do not provide ATC services to aircraft at airports that lie within a THA unless real-time notifications of the actual start of activity and end of activity of the THA is provided to affected facilities via ATCSCC coordination.

**REFERENCE–**

FAA Order JO 7210.3, Para 20–6–4, Airports within Aircraft Hazard Areas and Transitional Hazard Areas.

### 9–3–3. VFR-ON-TOP

If the aircraft's route, track, or altitude may cause it to enter an active Prohibited/Restricted/Warning Area, MOA, or ATCAA:

**a.** Inform the pilot to conduct flight “VFR-on-top” at least 500 feet above the upper limit or below the lower limit of the airspace (subject to Paragraph 7–3–1, VFR-on-top); or

**PHRASEOLOGY–**

MAINTAIN VFR-ON-TOP AT LEAST 500 FEET

ABOVE/BELOW (upper/lower limit of airspace) ACROSS (name or number of airspace) BETWEEN (fix) AND (fix);

and if the airspace is an ATCAA,

(name of ATCAA) IS ATC ASSIGNED AIRSPACE.

**REFERENCE–**

FAA Order JO 7110.65, Para 7–1–1, Class A Airspace Restrictions.

**b.** Clear the aircraft via a routing which provides approved separation from the airspace.

**c. Exception:** Some Prohibited/Restricted Areas are established for security reasons or to contain hazardous activities not involving aircraft operations. The addition of 500 (or 1,000) feet to the upper/lower limit of these Prohibited/Restricted Areas is not required if the areas have been identified by facility management.

**REFERENCE–**

FAA Order JO 7210.3, Para 2–1–18, Prohibited/Restricted Areas.

### 9–3–4. 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 facilities.*

**b.** If unable to comply with instructions/clearances, clear the aircraft in accordance with Paragraph 9–3–2, Separation Minima.

**NOTE–**

*The FAA has no jurisdictional authority over the use of nonjoint use prohibited/restricted/warning area airspace; therefore, clearance cannot be issued for flight therein without the appropriate approval.*

remain clear of the suspect aircraft by at least 100 yards 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/airport 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 facilities 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/her 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.

## 10-2-12. EXPLOSIVE DETECTION K-9 TEAMS

Take the following actions should you receive an aircraft request for the location of the nearest explosive detection K-9 team.

**REFERENCE–**

*FAA Order JO 7210.3, Para 2-1-12, Explosives Detection K-9 Teams.*

a. Obtain the aircraft identification and position and advise your supervisor of the pilot request.

b. When you receive the nearest location of the explosive detection K-9 team, relay the information to the pilot.

c. If the aircraft wishes to divert to the airport location provided, obtain an estimated arrival time from the pilot and advise your supervisor.

## 10-2-13. MANPADS ALERT

When a threat or attack from Man-Portable Air Defense Systems (MANPADS) is determined to be real, notify and advise aircraft as follows:

a. Do not withhold landing clearance. To the extent possible, issue information on MANPADS threats, confirmed attacks, or post-event activities in time for it to be useful to the pilot. The pilot or parent company will determine the pilot's actions.

b. MANPADS information will be disseminated via the ATIS and/or controller-to-pilot transmissions.

c. Disseminate via controller-to-pilot transmission until the appropriate MANPADS information is broadcast via the ATIS and pilots indicate they have received the appropriate ATIS code. MANPADS information will include nature and location of threat or incident, whether reported or observed and by whom, time (if known), and when transmitting to an individual aircraft, a request for pilot's intentions.

**PHRASEOLOGY–**

*ATTENTION (aircraft identification), MANPADS ALERT. EXERCISE EXTREME CAUTION. MANPADS THREAT/ ATTACK/POST-EVENT ACTIVITY OBSERVED/ REPORTED BY (reporting agency) (location) AT (time, if known). (When transmitting to an individual aircraft) SAY INTENTIONS.*

**EXAMPLE–**

*“Attention Eastern Four Seventeen, MANPADS alert. Exercise extreme caution. MANPADS threat reported by TSA, LaGuardia vicinity. Say intentions.”*

*“Attention all aircraft, MANPADS alert. Exercise extreme caution. MANPADS post-event activity observed by tower south of airport at two-one-zero-zero Zulu.”*

d. Report MANPADS threat/attack/post-event activity via the ATIS and/or controller-to-pilot transmissions until notified otherwise by the Domestic Events Network (DEN) Air Traffic Security Coordinator (ATSC).

**REFERENCE–**

*FAA Order JO 7110.65, Para 2-9-3, Content.*

*FAA Order JO 7210.3, Para 2-1-10, Handling MANPADS Incidents.*

*FAA Order JO 7610.4, Para 16-1-3, Responsibilities.*

## 10-2-14. UNAUTHORIZED LASER ILLUMINATION OF AIRCRAFT

a. When a laser event is reported to an air traffic facility, broadcast on all appropriate frequencies a general caution warning every five minutes for 20 minutes following the last report.

**PHRASEOLOGY–**

*UNAUTHORIZED LASER ILLUMINATION EVENT, (location), (altitude).*

b. Terminal facilities must include reported unauthorized laser illumination events on the ATIS

broadcast for one hour following the last report. Include the time, location, altitude, color, and direction of the laser as reported by the pilot.

**NOTE—**

*All personnel can expect aircrews to regard lasers as an inflight emergency and may take evasive action to avoid laser illumination. Additionally, other aircraft may request clearance to avoid the area.*

**REFERENCE—**

*FAA Order JO 7110.65, Para 2–9–3, Content.*

*FAA Order JO 7210.3, Para 2–1–29, Reporting Unauthorized Laser Illumination of Aircraft.*

## 10–2–15. EMERGENCY AIRPORT RECOMMENDATION

**a.** Consider the following factors when recommending an emergency airport:

1. Remaining fuel in relation to airport distances.
2. Weather conditions.

**NOTE—**

*Depending on the nature of the emergency, certain weather phenomena may deserve weighted consideration when recommending an airport; e.g., a pilot may elect to fly farther to land at an airport with VFR instead of IFR conditions.*

3. Airport conditions.
4. NAVAID status.
5. Aircraft type.
6. Pilot's qualifications.
7. Vectoring or homing capability to the emergency airport.

**b.** Consideration to the provisions of subpara a and Paragraph 10–2–16, Guidance to Emergency Airport, must be used in conjunction with the information derived from any automated emergency airport information source.

## 10–2–16. GUIDANCE TO EMERGENCY AIRPORT

**a.** When necessary, use any of the following for guidance to the airport:

1. Radar.
2. Following another aircraft.
3. NAVAIDs.

4. Pilotage by landmarks.

5. Compass headings.

**b.** Consideration to the provisions of Para 10–2–15, Emergency Airport Recommendation, must be used in conjunction with the information derived from any automated emergency airport information source.

## 10–2–17. EMERGENCY OBSTRUCTION VIDEO MAP (EOVM)

**a.** The EOVM is intended to facilitate advisory service to an aircraft in an emergency situation wherein an appropriate terrain/obstacle clearance minimum altitude cannot be maintained. It must only be used and the service provided under the following conditions:

1. The pilot has declared an emergency, or
2. The controller has determined that an emergency condition exists or is imminent because of the pilot's inability to maintain an appropriate terrain/obstacle clearance minimum altitude.

**NOTE—**

*Appropriate terrain/obstacle clearance minimum altitudes may be defined as Minimum IFR Altitude (MIA), Minimum En Route Altitude (MEA), Minimum Obstruction Clearance Altitude (MOCA), or Minimum Vectoring Altitude (MVA).*

**b.** When providing emergency vectoring service, the controller must advise the pilot that any headings issued are emergency advisories intended only to direct the aircraft toward and over an area of lower terrain/obstacle elevation.

**NOTE—**

*Altitudes and obstructions depicted on the EOVM are the actual altitudes and locations of the obstacle/terrain and contain no lateral or vertical buffers for obstruction clearance.*

**REFERENCE—**

*FAA Order JO 7210.3, Para 3–8–4, Emergency Obstruction Video Map (EOVM).*

## 10–2–18. 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 altitude(s).
2. Suggest appropriate reroutes to avoid the area of known or forecast ash clouds.

## Section 3. Overdue Aircraft

### 10-3-1. OVERDUE AIRCRAFT/OTHER SITUATIONS

a. Consider an aircraft to be overdue and initiate the procedures stated in this section to issue an ALNOT when neither communications nor radar contact can be established 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.

3. A VFR or IFR aircraft arriving at an airport not served by an air traffic control tower or flight service station fails to cancel a flight plan after receiving instructions on how to cancel.

**NOTE—**

*If you have reason to believe that an aircraft is overdue prior to 30 minutes, take the appropriate action immediately.*

b. Consider an aircraft to be in an emergency status and initiate ALNOT procedures in this section immediately when there is an abnormal simultaneous loss of radar and communications with an IFR aircraft or VFR/SVFR aircraft receiving flight following services. This situation may be applicable to an aircraft operating in a non-radar environment and an unexpected/abnormal loss of communications occurs.

c. The ARTCC in whose area the aircraft is reported as overdue, missing or lost will make these determinations and takes any subsequent action required.

d. If you have reason to believe that an aircraft is overdue prior to 30 minutes, take the appropriate action immediately.

e. The center in whose area the aircraft is first unreported or overdue will make these determinations and takes any subsequent action required.

**REFERENCE—**

*FAA Order JO 7110.65, Para 4-3-4, Departure Restrictions, Clearance Void Times, Hold for Release, and Release Times.*

### 10-3-2. INFORMATION TO BE FORWARDED TO ARTCC

#### TERMINAL

When an aircraft is considered to be in emergency status that may require SAR procedures, or an IFR aircraft is overdue, the terminal facility must alert the appropriate ARTCC 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. Aircraft beacon code.

e. Number of persons on board.

f. Fuel status.

g. Facility working aircraft and frequency.

h. Last known position, how determined, time, 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—**

*FAA Order JO 7110.65, Para 10-1-4, Responsibility.*

*FAA Order JO 7110.65, Para 10-2-5, Emergency Situations.*

**NOTE—**

*FSSs serve as the central points for collecting and disseminating information on an overdue or missing aircraft which is not on an IFR flight plan. Non-FSS ATC facilities that receive telephone calls or other inquiries regarding these flights must refer these calls and inquiries to the appropriate FSS.*

### 10-3-3. INFORMATION TO BE FORWARDED TO RCC

#### EN ROUTE

When an aircraft is considered to be in emergency status or an IFR aircraft is overdue, the ARTCC must

alert the RCC and forward the following information, as available:

- a. Facility 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. Aircraft beacon code.
- f. Action taken by reporting facility and proposed action.
- g. Number of persons on board.
- h. Fuel status.
- i. Facility working aircraft and frequency.
- j. Last known position, how determined, time, estimated present position, and maximum range of flight of the aircraft based on remaining fuel and airspeed.
- k. Position of other aircraft near aircraft's route of flight, when requested.
- l. Whether or not an ELT signal has been heard or reported in the vicinity of the last known position.
- m. Other pertinent information.

**REFERENCE—**

FAA Order JO 7110.65, Para 10-1-4, Responsibility.

FAA Order JO 7110.65, Para 10-2-5, Emergency Situations.

**NOTE—**

*FSSs serve as the central points for collecting and disseminating information on an overdue or missing aircraft which is not on an IFR flight plan. Non-FSS ATC facilities that receive telephone calls or other inquiries regarding these flights must refer these calls and inquiries to the appropriate FSS.*

#### 10-3-4. ALNOT

##### EN ROUTE

a. In addition to routing to the regional office operations center for the area in which the facility is located, issue an ALNOT to all centers and Area B circuits, generally 50 miles on either side of the route of flight from the last reported position to destination. Include the original or amended flight plan, as appropriate, and the last known position of the aircraft. At the recommendation of the RCC or at your

discretion, the ALNOT may be issued to cover the maximum range of the aircraft.

**NOTE—**

1. An ALNOT must be issued before the RCC can begin search and rescue procedures.

2. Flight plan information on military aircraft is available at the FSS serving as a tie-in station for the departure or destination airport. FAA tie-in stations for airports in the continental U.S. are listed in FAA Order JO 7350.8, Location Identifiers. In the West Flight Services Area Office, tie-in stations are listed in service area publications entitled, "Flight Plan Routing and Airport Search Directory." For flights with overseas departure points, the information is available through the destination FSS or the appropriate IFSS.

b. Upon receipt of an INREQ or ALNOT, check the position records to determine whether the aircraft has contacted your facility. Notify the originator of the results or status of this check within one hour of the time the alert was received. Retain the alert in an active status, and immediately notify the originator of subsequent contact, until cancellation is received.

c. Include pertinent information in the ALNOT that will aid the RCC and SAR Teams in conducting the SAR mission. When known, include:

- 1. Last known position.
- 2. Time.
- 3. Aircraft beacon code.

d. When information is obtained not previously contained in the ALNOT, issue an amended ALNOT to update information that will assist the SAR providers.

#### 10-3-5. RESPONSIBILITY TRANSFER TO RCC

##### EN ROUTE

Transfer responsibility for further search to the RCC when one of the following occurs:

- a. Thirty minutes have elapsed after the estimated aircraft fuel exhaustion time.
- b. The aircraft has not been located within one hour after ALNOT issuance.
- c. The ALNOT search has been completed with negative results.

# PILOT/CONTROLLER GLOSSARY

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## PURPOSE

a. This Glossary was compiled to promote a common understanding of the terms used in the Air Traffic Control system. It includes those terms which are intended for pilot/controller communications. Those terms most frequently used in pilot/controller communications are printed in ***bold italics***. The definitions are primarily defined in an operational sense applicable to both users and operators of the National Airspace System. Use of the Glossary will preclude any misunderstandings concerning the system's design, function, and purpose.

b. Because of the international nature of flying, terms used in the Lexicon, published by the International Civil Aviation Organization (ICAO), are included when they differ from FAA definitions. These terms are followed by "[ICAO]." For the reader's convenience, there are also cross references to related terms in other parts of the Glossary and to other documents, such as the Code of Federal Regulations (CFR) and the Aeronautical Information Manual (AIM).

c. This Glossary will be revised, as necessary, to maintain a common understanding of the system.

## EXPLANATION OF CHANGES

### d. Terms Added:

AIRCRAFT HAZARD AREA (AHA)  
AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST IN (ADS–B In)  
AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST OUT (ADS–B Out)  
CONTINGENCY HAZARD AREA (CHA)  
COOPERATIVE SURVEILLANCE  
NON–COOPERATIVE SURVEILLANCE  
PRM APPROACH  
REFINED HAZARD AREA (RHA)  
ROUND–ROBIN FLIGHT PLAN  
SPACE–BASED ADS–B (SBA)  
SPOOFING  
TRANSITIONAL HAZARD AREA (THA)  
UNSERVICEABLE (U/S)

### e. Terms Deleted:

GROUND–BASED TRANSCEIVER (GBT)  
HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS)  
HIWAS BROADCAST AREA  
HIWAS OUTLET AREA  
ILS PRM APPROACH  
RUNWAY VISIBILITY VALUE (RVV)

### f. Terms Modified:

AREA NAVIGATION (RNAV) GLOBAL POSITIONING SYSTEM (GPS) PRECISION RUNWAY MONITORING (PRM) APPROACH  
AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST (ADS–B)  
FUSION [STARS/CARTS]  
GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) [ICAO]

ICING  
JAMMING  
OUT OF SERVICE  
RADAR  
SQUAWK (Mode, Code, Function)  
STOP ALTITUDE SQUAWK  
STOP SQUAWK (Mode or Code)  
TARGET  
TARGET SYMBOL  
TRANSMISSOMETER  
VISIBILITY

g. Editorial/format changes were made where necessary. Revision bars were not used due to the insignificant nature of the changes.

navigation aids, navigation routes, designated airspace, and airports. Commonly used aeronautical charts are:

**a. Sectional Aeronautical Charts (1:500,000)**– Designed for visual navigation of slow or medium speed aircraft. Topographic information on these charts features the portrayal of relief and a judicious selection of visual check points for VFR flight. Aeronautical information includes visual and radio aids to navigation, airports, controlled airspace, permanent special use airspace (SUA), obstructions, and related data.

**b. VFR Terminal Area Charts (1:250,000)**– Depict Class B airspace which provides for the control or segregation of all the aircraft within Class B airspace. The chart depicts topographic information and aeronautical information which includes visual and radio aids to navigation, airports, controlled airspace, permanent SUA, obstructions, and related data.

**c. En Route Low Altitude Charts**– Provide aeronautical information for en route instrument navigation (IFR) in the low altitude stratum. Information includes the portrayal of airways, limits of controlled airspace, position identification and frequencies of radio aids, selected airports, minimum en route and minimum obstruction clearance altitudes, airway distances, reporting points, permanent SUA, and related data. Area charts, which are a part of this series, furnish terminal data at a larger scale in congested areas.

**d. En Route High Altitude Charts**– Provide aeronautical information for en route instrument navigation (IFR) in the high altitude stratum. Information includes the portrayal of jet routes, identification and frequencies of radio aids, selected airports, distances, time zones, special use airspace, and related information.

**e. Instrument Approach Procedure (IAP) Charts**– Portray the aeronautical data which is required to execute an instrument approach to an airport. These charts depict the procedures, including all related data, and the airport diagram. Each procedure is designated for use with a specific type of electronic navigation system including NDB, TACAN, VOR, ILS RNAV and GLS. These charts are identified by the type of navigational aid(s)/equipment required to provide final approach guidance.

**f. Instrument Departure Procedure (DP) Charts**– Designed to expedite clearance delivery and to facilitate transition between takeoff and en route operations. Each DP is presented as a separate chart and may serve a single airport or more than one airport in a given geographical location.

**g. Standard Terminal Arrival (STAR) Charts**– Designed to expedite air traffic control arrival procedures and to facilitate transition between en route and instrument approach operations. Each STAR procedure is presented as a separate chart and may serve a single airport or more than one airport in a given geographical location.

**h. Airport Taxi Charts**– Designed to expedite the efficient and safe flow of ground traffic at an airport. These charts are identified by the official airport name; e.g., Ronald Reagan Washington National Airport.

(See ICAO term AERONAUTICAL CHART.)

**AERONAUTICAL CHART [ICAO]**– A representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation.

**AERONAUTICAL INFORMATION MANUAL (AIM)**– A primary FAA publication whose purpose is to instruct airmen about operating in the National Airspace System of the U.S. It provides basic flight information, ATC Procedures and general instructional information concerning health, medical facts, factors affecting flight safety, accident and hazard reporting, and types of aeronautical charts and their use.

**AERONAUTICAL INFORMATION PUBLICATION (AIP) [ICAO]**– A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

(See CHART SUPPLEMENT U.S.)

**AFFIRMATIVE**– Yes.

**AFIS**–

(See AUTOMATIC FLIGHT INFORMATION SERVICE – ALASKA FSSs ONLY.)

**AFP**–

(See AIRSPACE FLOW PROGRAM.)

**AHA**–

(See AIRCRAFT HAZARD AREA.)

AIM–

(See AERONAUTICAL INFORMATION MANUAL.)

AIP [ICAO]–

(See ICAO term AERONAUTICAL INFORMATION PUBLICATION.)

**AIR CARRIER DISTRICT OFFICE**– An FAA field office serving an assigned geographical area, staffed with Flight Standards personnel serving the aviation industry and the general public on matters related to the certification and operation of scheduled air carriers and other large aircraft operations.

**AIR DEFENSE EMERGENCY**– A military emergency condition declared by a designated authority. This condition exists when an attack upon the continental U.S., Alaska, Canada, or U.S. installations in Greenland by hostile aircraft or missiles is considered probable, is imminent, or is taking place.

(Refer to AIM.)

**AIR DEFENSE IDENTIFICATION ZONE (ADIZ)**– An area of airspace over land or water in which the ready identification, location, and control of all aircraft (except for Department of Defense and law enforcement aircraft) is required in the interest of national security.

Note: ADIZ locations and operating and flight plan requirements for civil aircraft operations are specified in 14 CFR Part 99.

(Refer to AIM.)

**AIR NAVIGATION FACILITY**– Any facility used in, available for use in, or designed for use in, aid of air navigation, including landing areas, lights, any apparatus or equipment for disseminating weather information, for signaling, for radio-directional finding, or for radio or other electrical communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing and takeoff of aircraft.

(See NAVIGATIONAL AID.)

**AIR ROUTE SURVEILLANCE RADAR**– Air route traffic control center (ARTCC) radar used primarily to detect and display an aircraft's position while en route between terminal areas. The ARSR enables controllers to provide radar air traffic control service when aircraft are within the ARSR coverage. In some instances, ARSR may enable an ARTCC to provide terminal radar services similar to but usually more

limited than those provided by a radar approach control.

**AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC)**– A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

(See EN ROUTE AIR TRAFFIC CONTROL SERVICES.)

(Refer to AIM.)

**AIR TAXI**– Used to describe a helicopter/VTOL aircraft movement conducted above the surface but normally not above 100 feet AGL. The aircraft may proceed either via hover taxi or flight at speeds more than 20 knots. The pilot is solely responsible for selecting a safe airspeed/altitude for the operation being conducted.

(See HOVER TAXI.)

(Refer to AIM.)

**AIR TRAFFIC**– Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

(See ICAO term AIR TRAFFIC.)

**AIR TRAFFIC [ICAO]**– All aircraft in flight or operating on the maneuvering area of an aerodrome.

**AIR TRAFFIC CLEARANCE**– An authorization by air traffic control for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace. The pilot-in-command of an aircraft may not deviate from the provisions of a visual flight rules (VFR) or instrument flight rules (IFR) air traffic clearance except in an emergency or unless an amended clearance has been obtained. Additionally, the pilot may request a different clearance from that which has been issued by air traffic control (ATC) if information available to the pilot makes another course of action more practicable or if aircraft equipment limitations or company procedures forbid compliance with the clearance issued. Pilots may also request clarification or amendment, as appropriate, any time a clearance is not fully understood, or considered unacceptable because of safety of flight. Controllers should, in such instances and to the extent of operational practicality and safety, honor the pilot's request.

14 CFR Part 91.3(a) states: “The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.” THE PILOT IS RESPONSIBLE TO REQUEST AN AMENDED CLEARANCE if ATC issues a clearance that would cause a pilot to deviate from a rule or regulation, or in the pilot’s opinion, would place the aircraft in jeopardy.

(See ATC INSTRUCTIONS.)

(See ICAO term AIR TRAFFIC CONTROL CLEARANCE.)

**AIR TRAFFIC CONTROL**– A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.

(See ICAO term AIR TRAFFIC CONTROL SERVICE.)

**AIR TRAFFIC CONTROL CLEARANCE [ICAO]**– 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.

Note 2: The abbreviated term clearance may be prefixed by the words taxi, takeoff, departure, en route, approach or landing to indicate the particular portion of flight to which the air traffic control clearance relates.

**AIR TRAFFIC CONTROL SERVICE**–  
(See AIR TRAFFIC CONTROL.)

**AIR TRAFFIC CONTROL SERVICE [ICAO]**– 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 SPECIALIST**– A person authorized to provide air traffic control service.

(See AIR TRAFFIC CONTROL.)

(See FLIGHT SERVICE STATION.)

(See ICAO term CONTROLLER.)

**AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER (ATCSCC)**– An Air Traffic Tactical Operations facility responsible for monitoring and managing the flow of air traffic throughout the NAS, producing a safe, orderly, and expeditious flow of

traffic while minimizing delays. The following functions are located at the ATCSCC:

**a.** Central Altitude Reservation Function (CARF). Responsible for coordinating, planning, and approving special user requirements under the Altitude Reservation (ALTRV) concept.

(See ALTITUDE RESERVATION.)

**b.** Airport Reservation Office (ARO). Monitors the operation and allocation of reservations for unscheduled operations at airports designated by the Administrator as High Density Airports. These airports are generally known as slot controlled airports. The ARO allocates reservations on a first come, first served basis determined by the time the request is received at the ARO.

(Refer to 14 CFR Part 93.)

(See CHART SUPPLEMENT U.S.)

**c.** U.S. Notice to Airmen (NOTAM) Office. Responsible for collecting, maintaining, and distributing NOTAMs for the U.S. civilian and military, as well as international aviation communities.

(See NOTICE TO AIRMEN.)

**d.** Weather Unit. Monitor all aspects of weather for the U.S. that might affect aviation including cloud cover, visibility, winds, precipitation, thunderstorms, icing, turbulence, and more. Provide forecasts based on observations and on discussions with meteorologists from various National Weather Service offices, FAA facilities, airlines, and private weather services.

**AIR TRAFFIC SERVICE**– A generic term meaning:

- a.** Flight Information Service.
- b.** Alerting Service.
- c.** Air Traffic Advisory Service.
- d.** Air Traffic Control Service:
  - 1.** Area Control Service,
  - 2.** Approach Control Service, or
  - 3.** Airport Control Service.

**AIR TRAFFIC SERVICE (ATS) ROUTES** – The term “ATS Route” is a generic term that includes “VOR Federal airways,” “colored Federal airways,” “jet routes,” and “RNAV routes.” The term “ATS route” does not replace these more familiar route names, but serves only as an overall title when listing the types of routes that comprise the United States route structure.

**AIRBORNE**– An aircraft is considered airborne when all parts of the aircraft are off the ground.

**AIRBORNE DELAY**– Amount of delay to be encountered in airborne holding.

**AIRCRAFT**– Device(s) that are used or intended to be used for flight in the air, and when used in air traffic control terminology, may include the flight crew.

(See ICAO term **AIRCRAFT**.)

**AIRCRAFT [ICAO]**– Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

**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 must 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 category for that speed must be used. For example, an aircraft which falls in Category A, but is circling to land at a speed in excess of 91 knots, must 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.
- (Refer to 14 CFR Part 97.)

**AIRCRAFT CLASSES**– For the purposes of Wake Turbulence Separation Minima, ATC classifies aircraft as Super, Heavy, Large, and Small as follows:

- a. Super. The Airbus A-380-800 (A388) and the Antonov An-225 (A225) are classified as super.
- b. Heavy– Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.
- c. Large– Aircraft of more than 41,000 pounds, maximum certificated takeoff weight, up to but not including 300,000 pounds.

d. Small– Aircraft of 41,000 pounds or less maximum certificated takeoff weight.

(Refer to AIM.)

**AIRCRAFT CONFLICT**– Predicted conflict, within EDST of two aircraft, or between aircraft and airspace. A Red alert is used for conflicts when the predicted minimum separation is 5 nautical miles or less. A Yellow alert is used when the predicted minimum separation is between 5 and approximately 12 nautical miles. A Blue alert is used for conflicts between an aircraft and predefined airspace.

(See **EN ROUTE DECISION SUPPORT TOOL**.)

**AIRCRAFT LIST (ACL)**– A view available with EDST that lists aircraft currently in or predicted to be in a particular sector's airspace. The view contains textual flight data information in line format and may be sorted into various orders based on the specific needs of the sector team.

(See **EN ROUTE DECISION SUPPORT TOOL**.)

**AIRCRAFT SURGE LAUNCH AND RECOVERY**– Procedures used at USAF bases to provide increased launch and recovery rates in instrument flight rules conditions. ASLAR is based on:

- a. Reduced separation between aircraft which is based on time or distance. Standard arrival separation applies between participants including multiple flights until the DRAG point. The DRAG point is a published location on an ASLAR approach where aircraft landing second in a formation slows to a predetermined airspeed. The DRAG point is the reference point at which MARSA applies as expanding elements effect separation within a flight or between subsequent participating flights.
- b. ASLAR procedures shall be covered in a Letter of Agreement between the responsible USAF military ATC facility and the concerned Federal Aviation Administration facility. Initial Approach Fix spacing requirements are normally addressed as a minimum.

**AIRCRAFT HAZARD AREA (AHA)**– Used by ATC to segregate air traffic from a launch vehicle, reentry vehicle, amateur rocket, jettisoned stages, hardware, or falling debris generated by failures associated with any of these activities. An AHA is

designated via NOTAM as either a TFR or stationary ALTRV. Unless otherwise specified, the vertical limits of an AHA are from the surface to unlimited.

(See CONTINGENCY HAZARD AREA.)

(See REFINED HAZARD AREA.)

(See TRANSITIONAL HAZARD AREA.)

**AIRCRAFT WAKE TURBULENCE CATEGORIES**– For the purpose of Wake Turbulence Recategorization (RECAT) Separation Minima, ATC groups aircraft into categories ranging from Category A through Category I, dependent upon the version of RECAT that is applied. Specific category assignments vary and are listed in the RECAT Orders.

**AIRMEN'S METEOROLOGICAL INFORMATION (AIRMET)**– In-flight weather advisories issued only to amend the Aviation Surface Forecast, Aviation Cloud Forecast, or area forecast concerning weather phenomena which are of operational interest to all aircraft and potentially hazardous to aircraft having limited capability because of lack of equipment, instrumentation, or pilot qualifications. AIRMETs concern weather of less severity than that covered by SIGMETs or Convective SIGMETs. AIRMETs cover moderate icing, moderate turbulence, sustained winds of 30 knots or more at the surface, widespread areas of ceilings less than 1,000 feet and/or visibility less than 3 miles, and extensive mountain obscurement.

(See AWW.)

(See CONVECTIVE SIGMET.)

(See CWA.)

(See SIGMET.)

(Refer to AIM.)

**AIRPORT**– An area on land or water that is used or intended to be used for the landing and takeoff of aircraft and includes its buildings and facilities, if any.

**AIRPORT ADVISORY AREA**– The area within ten miles of an airport without a control tower or where the tower is not in operation, and on which a Flight Service Station is located.

(See LOCAL AIRPORT ADVISORY.)

(Refer to AIM.)

**AIRPORT ARRIVAL RATE (AAR)**– A dynamic input parameter specifying the number of arriving aircraft which an airport or airspace can accept from the ARTCC per hour. The AAR is used to calculate

the desired interval between successive arrival aircraft.

**AIRPORT DEPARTURE RATE (ADR)**– A dynamic parameter specifying the number of aircraft which can depart an airport and the airspace can accept per hour.

**AIRPORT ELEVATION**– The highest point of an airport's usable runways measured in feet from mean sea level.

(See TOUCHDOWN ZONE ELEVATION.)

(See ICAO term AERODROME ELEVATION.)

**AIRPORT LIGHTING**– 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/her 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-1**– 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 Sequenced Flashing Lights.

**4. SSALR**– Simplified Short Approach Light System with Runway Alignment Indicator Lights.

**5. MALSF**– Medium Intensity Approach Light System with Sequenced Flashing Lights.

**6. MALSR**– Medium Intensity Approach Light System with Runway Alignment Indicator Lights.

**7. RLLS**– Runway Lead-in Light System Consists of one or more series of flashing lights installed at or near ground level that provides positive visual guidance along an approach path, either curving or straight, where special problems exist with hazardous terrain, obstructions, or noise abatement procedures.

**8. RAIL**– Runway Alignment Indicator Lights– Sequenced Flashing Lights which are installed only in combination with other light systems.

**9. ODALS–** Omnidirectional Approach Lighting System consists of seven omnidirectional flashing lights located in the approach area of a nonprecision runway. Five lights are located on the runway centerline extended with the first light located 300 feet from the threshold and extending at equal intervals up to 1,500 feet from the threshold. The other two lights are located, one on each side of the runway threshold, at a lateral distance of 40 feet from the runway edge, or 75 feet from the runway edge when installed on a runway equipped with a VASI.

(Refer to FAA Order JO 6850.2, VISUAL GUIDANCE LIGHTING SYSTEMS.)

**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/she is “on path” if he/she sees red/white, “above path” if white/white, and “below path” if red/red. Some airports serving large aircraft have three-bar VASIs which provide two visual glide paths to the same runway.

**h. Precision Approach Path Indicator (PAPI)–** An airport lighting facility, similar to VASI, providing vertical approach slope guidance to aircraft during approach to landing. PAPIs consist of a single row of

either two or four lights, normally installed on the left side of the runway, and have an effective visual range of about 5 miles during the day and up to 20 miles at night. PAPIs radiate a directional pattern of high intensity red and white focused light beams which indicate that the pilot is “on path” if the pilot sees an equal number of white lights and red lights, with white to the left of the red; “above path” if the pilot sees more white than red lights; and “below path” if the pilot sees more red than white lights.

**i. Boundary Lights–** Lights defining the perimeter of an airport or landing area.

(Refer to AIM.)

**AIRPORT MARKING AIDS–** Markings used on runway and taxiway surfaces to identify a specific runway, a runway threshold, a centerline, a hold line, etc. A runway should be marked in accordance with its present usage such as:

**a. Visual.**

**b. Nonprecision instrument.**

**c. Precision instrument.**

(Refer to AIM.)

**AIRPORT REFERENCE POINT (ARP)–** The approximate geometric center of all usable runway surfaces.

**AIRPORT RESERVATION OFFICE–** Office responsible for monitoring the operation of slot controlled airports. It receives and processes requests for unscheduled operations at slot controlled airports.

**AIRPORT ROTATING BEACON–** A visual NAVAID operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport. At military airports, the beacons flash alternately white and green, but are differentiated from civil beacons by dualpeaked (two quick) white flashes between the green flashes.

(See INSTRUMENT FLIGHT RULES.)

(See SPECIAL VFR OPERATIONS.)

(See ICAO term AERODROME BEACON.)

(Refer to AIM.)

**AIRPORT STREAM FILTER (ASF)–** An on/off filter that allows the conflict notification function to be inhibited for arrival streams into single or multiple airports to prevent nuisance alerts.

**AIRPORT SURFACE DETECTION EQUIPMENT (ASDE)–** 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. Used to augment visual observation by tower personnel of aircraft and/or vehicular movements on runways and taxiways. There are three ASDE systems deployed in the NAS:

- a. ASDE-3– a Surface Movement Radar.
- b. ASDE-X– a system that uses an X-band Surface Movement Radar, multilateration, and ADS-B.
- c. Airport Surface Surveillance Capability (ASSC)– A system that uses Surface Movement Radar, multilateration, and ADS-B.

**AIRPORT SURVEILLANCE RADAR**– 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.

**AIRPORT TAXI CHARTS**–

(See AERONAUTICAL CHART.)

**AIRPORT TRAFFIC CONTROL SERVICE**– A service provided by a control tower for aircraft operating on the movement area and in the vicinity of an airport.

(See MOVEMENT AREA.)

(See TOWER.)

(See ICAO term AERODROME CONTROL SERVICE.)

**AIRPORT TRAFFIC CONTROL TOWER**–

(See TOWER.)

**AIRSPACE CONFLICT**– Predicted conflict of an aircraft and active Special Activity Airspace (SAA).

**AIRSPACE FLOW PROGRAM (AFP)**– AFP is a Traffic Management (TM) process administered by the Air Traffic Control System Command Center (ATCSCC) where aircraft are assigned an Expected Departure Clearance Time (EDCT) in order to manage capacity and demand for a specific area of the National Airspace System (NAS). The purpose of the program is to mitigate the effects of en route constraints. It is a flexible program and may be implemented in various forms depending upon the needs of the air traffic system.

**AIRSPACE HIERARCHY**– Within the airspace classes, there is a hierarchy and, in the event of an overlap of airspace: Class A preempts Class B, Class B preempts Class C, Class C preempts Class D, Class D preempts Class E, and Class E preempts Class G.

**AIRSPEED**– 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.”

(Refer to 14 CFR Part 1.)

- 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.”

**AIRSTART**– The starting of an aircraft engine while the aircraft is airborne, preceded by engine shutdown during training flights or by actual engine failure.

**AIRWAY**– A Class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids.

(See FEDERAL AIRWAYS.)

(See ICAO term AIRWAY.)

(Refer to 14 CFR Part 71.)

(Refer to AIM.)

**AIRWAY [ICAO]**– A control area or portion thereof established in the form of corridor equipped with radio navigational aids.

**AIRWAY BEACON**– Used to mark airway segments in remote mountain areas. The light flashes Morse Code to identify the beacon site.

(Refer to AIM.)

**AIT**–

(See AUTOMATED INFORMATION TRANSFER.)

**ALERFA (Alert Phase) [ICAO]**– A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

**ALERT**– A notification to a position that there is an aircraft-to-aircraft or aircraft-to-airspace conflict, as detected by Automated Problem Detection (APD).

**ALERT AREA**–

(See SPECIAL USE AIRSPACE.)

**ALERT NOTICE (ALNOT)**– A request originated by a flight service station (FSS) or an air route traffic control center (ARTCC) for an extensive communication search for overdue, unreported, or missing aircraft.

**ALERTING SERVICE**– A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid and assist such organizations as required.

**ALNOT**–

(See ALERT NOTICE.)

**ALONG-TRACK DISTANCE (ATD)**– The horizontal distance between the aircraft's current position and a fix measured by an area navigation system that is not subject to slant range errors.

**ALPHANUMERIC DISPLAY**– Letters and numerals used to show identification, altitude, beacon code, and other information concerning a target on a radar display.

(See AUTOMATED RADAR TERMINAL SYSTEMS.)

**ALTERNATE AERODROME [ICAO]**– An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or 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 the flight.

**ALTERNATE AIRPORT**– An airport at which an aircraft may land if a landing at the intended airport becomes inadvisable.

(See ICAO term ALTERNATE AERODROME.)

**ALTIMETER SETTING**– The barometric pressure reading used to adjust a pressure altimeter for variations in existing atmospheric pressure or to the standard altimeter setting (29.92).

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**ALTITUDE**– The height of a level, point, or object measured in feet Above Ground Level (AGL) or from Mean Sea Level (MSL).

(See FLIGHT LEVEL.)

**a. MSL Altitude**– Altitude expressed in feet measured from mean sea level.

**b. AGL Altitude**– Altitude expressed in feet measured above ground level.

**c. Indicated Altitude**– The altitude as shown by an altimeter. On a pressure or barometric altimeter it is altitude as shown uncorrected for instrument error

and uncompensated for variation from standard atmospheric conditions.

(See ICAO term ALTITUDE.)

**ALTITUDE [ICAO]**– The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

**ALTITUDE READOUT**– An aircraft's altitude, transmitted via the Mode C transponder feature, that is visually displayed in 100-foot increments on a radar scope having readout capability.

(See ALPHANUMERIC DISPLAY.)

(See AUTOMATED RADAR TERMINAL SYSTEMS.)

(Refer to AIM.)

**ALTITUDE RESERVATION (ALTRV)**– 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 FAA facility.

(See AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER.)

**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.

**ALTITUDE RESTRICTIONS ARE CANCELED**– Adherence to previously imposed altitude restrictions is no longer required during a climb or descent.

**ALTRV**–

(See ALTITUDE RESERVATION.)

**AMVER**–

(See AUTOMATED MUTUAL-ASSISTANCE VESSEL RESCUE SYSTEM.)

**APB**–

(See AUTOMATED PROBLEM DETECTION BOUNDARY.)

**APD**–

(See AUTOMATED PROBLEM DETECTION.)

**APDIA**–

(See AUTOMATED PROBLEM DETECTION INHIBITED AREA.)

**APPROACH CLEARANCE**– Authorization by ATC for a pilot to conduct an instrument approach. The type of instrument approach for which a

clearance and other pertinent information is provided in the approach clearance when required.

(See CLEARED APPROACH.)

(See INSTRUMENT APPROACH PROCEDURE.)

(Refer to AIM.)

(Refer to 14 CFR Part 91.)

**APPROACH CONTROL FACILITY**– A terminal ATC facility that provides approach control service in a terminal area.

(See APPROACH CONTROL SERVICE.)

(See RADAR APPROACH CONTROL FACILITY.)

**APPROACH CONTROL SERVICE**– Air traffic control service provided by an approach control facility for arriving and departing VFR/IFR aircraft and, on occasion, en route aircraft. At some airports not served by an approach control facility, the ARTCC provides limited approach control service.

(See ICAO term APPROACH CONTROL SERVICE.)

(Refer to AIM.)

**APPROACH CONTROL SERVICE [ICAO]**– Air traffic control service for arriving or departing controlled flights.

**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 airport and will be no closer than 5 miles from the landing threshold.

**APPROACH/DEPARTURE HOLD AREA**– The locations on taxiways in the approach or departure areas of a runway designated to protect landing or departing aircraft. These locations are identified by signs and markings.

**APPROACH LIGHT SYSTEM**–

(See AIRPORT LIGHTING.)

**APPROACH SEQUENCE**– The order in which aircraft are positioned while on approach or awaiting approach clearance.

(See LANDING SEQUENCE.)

(See ICAO term APPROACH SEQUENCE.)

**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 landing. This speed will vary for different segments of an approach as well as for aircraft weight and configuration.

**APPROACH WITH VERTICAL GUIDANCE (APV)**– A term used to describe RNAV approach procedures that provide lateral and vertical guidance but do not meet the requirements to be considered a precision approach.

**APPROPRIATE ATS AUTHORITY [ICAO]**– The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned. In the United States, the “appropriate ATS authority” is the Program Director for Air Traffic Planning and Procedures, ATP-1.

**APPROPRIATE AUTHORITY**–

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

b. Regarding flight over other than the high seas: the relevant authority is 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 an airport or heliport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance. With regard to seaplanes, a ramp is used for access to the apron from the water.

(See ICAO term APRON.)

**APRON [ICAO]**– A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, refueling, 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 CONTROL CENTER [ICAO]**– An air traffic control facility primarily responsible for ATC services being provided IFR aircraft during the en route phase of flight. The U.S. equivalent facility is an air route traffic control center (ARTCC).

**AREA NAVIGATION (RNAV)**– A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

**Note:** Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

#### **AREA NAVIGATION (RNAV) APPROACH CONFIGURATION:**

**a. STANDARD T**– An 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**– An 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 centered on the IF bounded by a straight line extending through the IF perpendicular to the intermediate course.

**2. LEFT BASE AREA**– A 30NM arc centered 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 centered 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.

#### **AREA NAVIGATION (RNAV) GLOBAL POSITIONING SYSTEM (GPS) PRECISION RUNWAY MONITORING (PRM) APPROACH**–

A GPS approach, which requires vertical guidance, used in lieu of another type of PRM approach to conduct approaches to parallel runways whose extended centerlines are separated by less than 4,300 feet and at least 3,000 feet, where simultaneous close parallel approaches are permitted. Also used in lieu of an ILS PRM and/or LDA PRM approach to conduct Simultaneous Offset Instrument Approach (SOIA) operations.

**ARINC**– An acronym for Aeronautical Radio, Inc., a corporation largely owned by a group of airlines. ARINC is licensed by the FCC as an aeronautical station and contracted by the FAA to provide communications support for air traffic control and meteorological services in portions of international airspace.

**ARMY AVIATION FLIGHT INFORMATION BULLETIN**– A bulletin that provides air operation data covering Army, National Guard, and Army Reserve aviation activities.

**ARO**–

(See AIRPORT RESERVATION OFFICE.)

**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 tailhook and/or nontailhook-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.

(See ABORT.)

(Refer to AIM.)

**ARRIVAL AIRCRAFT INTERVAL**– 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**– The ARTCC having jurisdiction for the impacted airport.

**ARRIVAL DELAY**– A parameter which specifies a period of time in which no aircraft will be metered for arrival at the specified airport.

**ARRIVAL SECTOR**– An operational control sector containing one or more meter fixes.

**ARRIVAL SECTOR ADVISORY LIST**– An ordered list of data on arrivals displayed at the PVD/MDM of the sector which controls the meter fix.

**ARRIVAL SEQUENCING PROGRAM**– The automated program designed to assist in sequencing aircraft destined for the same airport.

**ARRIVAL TIME**– The time an aircraft touches down on arrival.

**ARSR**–

(See AIR ROUTE SURVEILLANCE RADAR.)

**ARTCC**–

(See AIR ROUTE TRAFFIC CONTROL CENTER.)

**ARTS**–

(See AUTOMATED RADAR TERMINAL SYSTEMS.)

**ASDA**–

(See ACCELERATE-STOP DISTANCE AVAILABLE.)

**ASDA [ICAO]**–

(See ICAO Term ACCELERATE-STOP DISTANCE AVAILABLE.)

**ASDE**–

(See AIRPORT SURFACE DETECTION EQUIPMENT.)

**ASF**–

(See AIRPORT STREAM FILTER.)

**ASLAR**–

(See AIRCRAFT SURGE LAUNCH AND RECOVERY.)

**ASP**–

(See ARRIVAL SEQUENCING PROGRAM.)

**ASR**–

(See AIRPORT SURVEILLANCE RADAR.)

**ASR APPROACH**–

(See SURVEILLANCE APPROACH.)

**ASSOCIATED**– A radar target displaying a data block with flight identification and altitude information.

(See UNASSOCIATED.)

**ATC**–

(See AIR TRAFFIC CONTROL.)

**ATC ADVISES**– Used to prefix a message of noncontrol information when it is relayed to an aircraft by other than an air traffic controller.

(See ADVISORY.)

**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.

(See SPECIAL USE AIRSPACE.)

**ATC CLEARANCE**–

(See AIR TRAFFIC CLEARANCE.)

**ATC CLEARS**– Used to prefix an ATC clearance when it is relayed to an aircraft by other than an air traffic controller.

**ATC INSTRUCTIONS**– Directives issued by air traffic control for the purpose of requiring a pilot to take specific actions; e.g., “Turn left heading two five zero,” “Go around,” “Clear the runway.”

(Refer to 14 CFR Part 91.)

**ATC PREFERRED ROUTE NOTIFICATION**– EDST notification to the appropriate controller of the need to determine if an ATC preferred route needs to be applied, based on destination airport.

(See ROUTE ACTION NOTIFICATION.)

(See EN ROUTE DECISION SUPPORT TOOL.)

**ATC PREFERRED ROUTES**– Preferred routes that are not automatically applied by Host.

**ATC REQUESTS**– Used to prefix an ATC request when it is relayed to an aircraft by other than an air traffic controller.

**ATC SECURITY SERVICES**– Communications and security tracking provided by an ATC facility in support of the DHS, the DOD, or other Federal security elements in the interest of national security. Such security services are only applicable within designated areas. ATC security services do not include ATC basic radar services or flight following.

**ATC SECURITY SERVICES POSITION**– The position responsible for providing ATC security services as defined. This position does not provide ATC, IFR separation, or VFR flight following services, but is responsible for providing security services in an area comprising airspace assigned to one or more ATC operating sectors. This position may be combined with control positions.

**ATC SECURITY TRACKING**– The continuous tracking of aircraft movement by an ATC facility in support of the DHS, the DOD, or other security elements for national security using radar (i.e., radar tracking) or other means (e.g., manual tracking) without providing basic radar services (including traffic advisories) or other ATC services not defined in this section.

**ATS SURVEILLANCE SERVICE [ICAO]**– A term used to indicate a service provided directly by means of an ATS surveillance system.

**ATC SURVEILLANCE SOURCE**– Used by ATC for establishing identification, control and separation using a target depicted on an air traffic control facility's video display that has met the relevant safety standards for operational use and received from one, or a combination, of the following surveillance sources:

- a. Radar (See RADAR.)
- b. ADS-B (See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST.)
- c. WAM (See WIDE AREA MULTILATERATION.)  
(See INTERROGATOR.)  
(See TRANSPONDER.)  
(See ICAO term RADAR.)  
(Refer to AIM.)

**ATS SURVEILLANCE SYSTEM [ICAO]**– 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.

**ATCAA**–  
(See ATC ASSIGNED AIRSPACE.)

**ATCRBS**–  
(See RADAR.)

**ATCSCC**–  
(See AIR TRAFFIC CONTROL SYSTEM  
COMMAND CENTER.)

**ATCT**–  
(See TOWER.)

**ATD**–  
(See ALONG–TRACK DISTANCE.)

**ATIS**–  
(See AUTOMATIC TERMINAL INFORMATION  
SERVICE.)

**ATIS [ICAO]**–  
(See ICAO Term AUTOMATIC TERMINAL  
INFORMATION SERVICE.)

**ATS ROUTE [ICAO]**– A specified route designed for channeling 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.

**ATTENTION ALL USERS PAGE (AAUP)**– The AAUP provides the pilot with additional information relative to conducting a specific operation, for example, PRM approaches and RNAV departures.

**AUTOLAND APPROACH**–An autoland system aids by providing control of aircraft systems during a precision instrument approach to at least decision altitude and possibly all the way to touchdown, as well as in some cases, through the landing rollout. The autoland system is a sub-system of the autopilot system from which control surface management occurs. The aircraft autopilot sends instructions to the autoland system and monitors the autoland system performance and integrity during its execution.

**AUTOMATED INFORMATION TRANSFER (AIT)**– A precoordinated 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 MUTUAL-ASSISTANCE VESSEL RESCUE SYSTEM**– A facility which can deliver, in

a matter of minutes, a surface picture (SURPIC) of vessels in the area of a potential or actual search and rescue incident, including their predicted positions and their characteristics.

(See FAA Order JO 7110.65, Para 10-6-4, INFLIGHT CONTINGENCIES.)

**AUTOMATED PROBLEM DETECTION (APD)**– An Automation Processing capability that compares trajectories in order to predict conflicts.

**AUTOMATED PROBLEM DETECTION BOUNDARY (APB)**– The adapted distance beyond a facilities boundary defining the airspace within which EDST performs conflict detection.

(See EN ROUTE DECISION SUPPORT TOOL.)

**AUTOMATED PROBLEM DETECTION INHIBITED AREA (APDIA)**– Airspace surrounding a terminal area within which APD is inhibited for all flights within that airspace.

**AUTOMATED RADAR TERMINAL SYSTEMS (ARTS)**– A generic term for several tracking systems included in the Terminal Automation Systems (TAS). ARTS plus a suffix roman numeral denotes a major modification to that system.

**a. ARTS IIIA.** The Radar Tracking and Beacon Tracking Level (RT&BTL) of the modular, program-mable automated radar terminal system. ARTS IIIA detects, tracks, and predicts primary as well as secondary radar-derived aircraft targets. This more sophisticated computer-driven system upgrades the existing ARTS III system by providing improved tracking, continuous data recording, and fail-soft capabilities.

**b. Common ARTS.** Includes ARTS IIE, ARTS IIIE; and ARTS IIIE with ACD (see DTAS) which combines functionalities of the previous ARTS systems.

**AUTOMATED WEATHER SYSTEM**– Any of the automated weather sensor platforms that collect weather data at airports and disseminate the weather information via radio and/or landline. The systems currently consist of the Automated Surface Observing System (ASOS) and Automated Weather Observation System (AWOS).

**AUTOMATED UNICOM**– Provides completely automated weather, radio check capability and airport

advisory information on an Automated UNICOM system. These systems offer a variety of features, typically selectable by microphone clicks, on the UNICOM frequency. Availability will be published in the Chart Supplement U.S. and approach charts.

**AUTOMATIC ALTITUDE REPORT**–  
(See ALTITUDE READOUT.)

**AUTOMATIC ALTITUDE REPORTING**– That function of a transponder which responds to Mode C interrogations by transmitting the aircraft's altitude in 100-foot increments.

**AUTOMATIC CARRIER LANDING SYSTEM**– U.S. Navy final approach equipment consisting of precision tracking radar coupled to a computer data link to provide continuous information to the aircraft, monitoring capability to the pilot, and a backup approach system.

**AUTOMATIC DEPENDENT SURVEILLANCE (ADS)** [ICAO]– 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 DEPENDENT SURVEILLANCE–BROADCAST (ADS-B)**– A surveillance system in which an aircraft or vehicle to be detected is fitted with cooperative equipment in the form of a data link transmitter. The aircraft or vehicle periodically broadcasts its GNSS-derived position and other required information such as identity and velocity, which is then received by a ground-based or space-based receiver for processing and display at an air traffic control facility, as well as by suitably equipped aircraft.

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST IN.)

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST OUT.)

(See COOPERATIVE SURVEILLANCE.)

(See GLOBAL POSITIONING SYSTEM.)

(See SPACE–BASED ADS–B.)

**AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST IN (ADS–B In)**– Aircraft avionics capable of receiving ADS–B Out transmissions directly from other aircraft, as well as traffic or

weather information transmitted from ground stations.

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST OUT.)

(See AUTOMATIC DEPENDENT SURVEILLANCE–REBROADCAST.)

(See FLIGHT INFORMATION SERVICE–BROADCAST.)

(See TRAFFIC INFORMATION SERVICE–BROADCAST.)

**AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST OUT (ADS–B Out)**– The transmitter onboard an aircraft or ground vehicle that periodically broadcasts its GNSS–derived position along with other required information, such as identity, altitude, and velocity.

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST.)

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST IN.)

**AUTOMATIC DEPENDENT SURVEILLANCE–CONTRACT (ADS–C)**– A data link position reporting system, controlled by a ground station, that establishes contracts with an aircraft’s avionics that occur automatically whenever specific events occur, or specific time intervals are reached.

**AUTOMATIC DEPENDENT SURVEILLANCE–REBROADCAST (ADS–R)**– A datalink translation function of the ADS–B ground system required to accommodate the two separate operating frequencies (978 MHz and 1090 MHz). The ADS–B system receives the ADS–B messages transmitted on one frequency and ADS–R translates and reformats the information for rebroadcast and use on the other frequency. This allows ADS–B In equipped aircraft to see nearby ADS–B Out traffic regardless of the operating link of the other aircraft. Aircraft operating on the same ADS–B frequency exchange information directly and do not require the ADS–R translation function.

**AUTOMATIC DIRECTION FINDER**– An aircraft radio navigation system which senses and indicates the direction to a L/MF nondirectional 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.

(See BEARING.)

(See NONDIRECTIONAL BEACON.)

**AUTOMATIC FLIGHT INFORMATION SERVICE (AFIS) – ALASKA FSSs ONLY**– The continuous broadcast of recorded non–control information at airports in Alaska where a FSS provides local airport advisory service. The AFIS broadcast automates the repetitive transmission of essential but routine information such as weather, wind, altimeter, favored runway, braking action, airport NOTAMs, and other applicable information. The information is continuously broadcast over a discrete VHF radio frequency (usually the ASOS/AWOS frequency).

**AUTOMATIC TERMINAL INFORMATION SERVICE**– The continuous broadcast of recorded noncontrol information in selected terminal areas. Its purpose is to improve controller effectiveness and to relieve frequency congestion by automating the repetitive transmission of essential but routine information; e.g., “Los Angeles information Alfa. One three zero zero Coordinated Universal Time. Weather, measured ceiling two thousand overcast, visibility three, haze, smoke, temperature seven one, dew point five seven, wind two five zero at five, altimeter two niner niner six. I–L–S Runway Two Five Left approach in use, Runway Two Five Right closed, advise you have Alfa.”

(See ICAO term AUTOMATIC TERMINAL INFORMATION SERVICE.)

(Refer to AIM.)

**AUTOMATIC TERMINAL INFORMATION SERVICE [ICAO]**– The provision of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts throughout the day or a specified portion of the day.

**AUTOROTATION**– A rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion.

**a. Autorotative Landing/Touchdown** Autorotation. Used by a pilot to indicate that the landing will be made without applying power to the rotor.

**b. Low Level Autorotation.** Commences at an altitude well below the traffic pattern, usually below 100 feet AGL and is used primarily for tactical military training.

c. 180 degrees Autorotation. Initiated from a downwind heading and is commenced well inside the normal traffic pattern. “Go around” may not be possible during the latter part of this maneuver.

**AVAILABLE LANDING DISTANCE (ALD)**– The portion of a runway available for landing and roll-out for aircraft cleared for LAHSO. This distance is measured from the landing threshold to the hold-short point.

**AVIATION WEATHER SERVICE**– A service provided by the National Weather Service (NWS) and

FAA which collects and disseminates pertinent weather information for pilots, aircraft operators, and ATC. Available aviation weather reports and forecasts are displayed at each NWS office and FAA FSS.

(See TRANSCRIBED WEATHER BROADCAST.)

(See WEATHER ADVISORY.)

(Refer to AIM.)

**AWW**–

(See SEVERE WEATHER FORECAST ALERTS.)



# C

**CALCULATED LANDING TIME**– A term that may be used in place of tentative or actual calculated landing time, whichever applies.

**CALL FOR RELEASE**– Wherein the overlying ARTCC requires a terminal facility to initiate verbal coordination to secure ARTCC approval for release of a departure into the en route environment.

**CALL UP**– Initial voice contact between a facility and an aircraft, using the identification of the unit being called and the unit initiating the call.

(Refer to AIM.)

**CANADIAN MINIMUM NAVIGATION PERFORMANCE SPECIFICATION AIRSPACE**– That portion of Canadian domestic airspace within which MNPS separation may be applied.

**CARDINAL ALTITUDES**– “Odd” or “Even” thousand-foot altitudes or flight levels; e.g., 5,000, 6,000, 7,000, FL 250, FL 260, FL 270.

(See ALTITUDE.)

(See FLIGHT LEVEL.)

**CARDINAL FLIGHT LEVELS**–

(See CARDINAL ALTITUDES.)

**CAT**–

(See CLEAR-AIR TURBULENCE.)

**CATCH POINT**– A fix/waypoint that serves as a transition point from the high altitude waypoint navigation structure to an arrival procedure (STAR) or the low altitude ground-based navigation structure.

**CEILING**– The heights above the earth’s surface of the lowest layer of clouds or obscuring phenomena that is reported as “broken,” “overcast,” or “obscuration,” and not classified as “thin” or “partial.”

(See ICAO term CEILING.)

**CEILING [ICAO]**– 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.

**CENRAP**–

(See CENTER RADAR ARTS  
PRESENTATION/PROCESSING.)

**CENRAP-PLUS**–

(See CENTER RADAR ARTS  
PRESENTATION/PROCESSING-PLUS.)

**CENTER**–

(See AIR ROUTE TRAFFIC CONTROL  
CENTER.)

**CENTER’S AREA**– The specified airspace within which an air route traffic control center (ARTCC) provides air traffic control and advisory service.

(See AIR ROUTE TRAFFIC CONTROL  
CENTER.)

(Refer to AIM.)

**CENTER RADAR ARTS PRESENTATION/PROCESSING**– A computer program developed to provide a back-up system for airport surveillance radar in the event of a failure or malfunction. The program uses air route traffic control center radar for the processing and presentation of data on the ARTS IIA or IIIA displays.

**CENTER RADAR ARTS PRESENTATION/PROCESSING-PLUS**– A computer program developed to provide a back-up system for airport surveillance radar in the event of a terminal secondary radar system failure. The program uses a combination of Air Route Traffic Control Center Radar and terminal airport surveillance radar primary targets displayed simultaneously for the processing and presentation of data on the ARTS IIA or IIIA displays.

**CENTER TRACON AUTOMATION SYSTEM (CTAS)**– A computerized set of programs designed to aid Air Route Traffic Control Centers and TRACONs in the management and control of air traffic.

**CENTER WEATHER ADVISORY**– An unscheduled weather advisory issued by Center Weather Service Unit meteorologists for ATC use to alert pilots of existing or anticipated adverse weather conditions within the next 2 hours. A CWA may modify or redefine a SIGMET.

(See AWW.)

(See AIRMET.)

(See CONVECTIVE SIGMET.)

(See SIGMET.)

(Refer to AIM.)

**CENTRAL EAST PACIFIC**– An organized route system between the U.S. West Coast and Hawaii.

**CEP**–

(See **CENTRAL EAST PACIFIC**.)

**CERAP**–

(See **COMBINED CENTER-RAPCON**.)

**CERTIFIED TOWER RADAR DISPLAY (CTRD)**– An FAA radar display certified for use in the NAS.

**CFR**–

(See **CALL FOR RELEASE**.)

**CHA**

(See **CONTINGENCY HAZARD AREA**)

**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.

**CHART SUPPLEMENT U.S.**– A publication designed primarily as a pilot's operational manual containing all airports, seaplane bases, and heliports open to the public including communications data, navigational facilities, and certain special notices and procedures. This publication is issued in seven volumes according to geographical area.

**CHARTED VFR FLYWAYS**– Charted VFR Flyways are flight paths recommended for use to bypass areas heavily traversed by large turbine-powered aircraft. Pilot compliance with recommended flyways and associated altitudes is strictly voluntary. VFR Flyway Planning charts are published on the back of existing VFR Terminal Area charts.

**CHARTED VISUAL FLIGHT PROCEDURE APPROACH**– An approach conducted while operating on an instrument flight rules (IFR) flight plan which authorizes the pilot of an aircraft to proceed visually and clear of clouds to the airport via visual landmarks and other information depicted on a charted visual flight procedure. This approach must be authorized and under the control of the appropriate air traffic control facility. Weather minimums required are depicted on the chart.

**CHASE**– An aircraft flown in proximity to another aircraft normally to observe its performance during training or testing.

**CHASE AIRCRAFT**–

(See **CHASE**.)

**CHOP**– A form of turbulence.

**a. Light Chop**– Turbulence that causes slight, rapid and somewhat rhythmic bumpiness without appreciable changes in altitude or attitude.

**b. Moderate Chop**– Turbulence similar to Light Chop but of greater intensity. It causes rapid bumps or jolts without appreciable changes in aircraft altitude or attitude.

(See **TURBULENCE**.)

**CIRCLE-TO-LAND MANEUVER**– A maneuver initiated by the pilot 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 airports, this maneuver is made only after ATC authorization has been obtained and the pilot has established required visual reference to the airport.

(See **CIRCLE TO RUNWAY**.)

(See **LANDING MINIMUMS**.)

(Refer to **AIM**.)

***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 airport/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 airport for a right downwind to Runway Two Two."

(See **CIRCLE-TO-LAND MANEUVER**.)

(See **LANDING MINIMUMS**.)

(Refer to **AIM**.)

**CIRCLING APPROACH**–

(See **CIRCLE-TO-LAND MANEUVER**.)

**CIRCLING MANEUVER**–

(See **CIRCLE-TO-LAND MANEUVER**.)

**CIRCLING MINIMA**–

(See **LANDING MINIMUMS**.)

**CLASS A AIRSPACE**–

(See **CONTROLLED AIRSPACE**.)

**CLASS B AIRSPACE**–

(See **CONTROLLED AIRSPACE**.)

**CLASS C AIRSPACE–**

(See CONTROLLED AIRSPACE.)

**CLASS D AIRSPACE–**

(See CONTROLLED AIRSPACE.)

**CLASS E AIRSPACE–**

(See CONTROLLED AIRSPACE.)

**CLASS G AIRSPACE–** Airspace that is not designated in 14 CFR Part 71 as Class A, Class B, Class C, Class D, or Class E controlled airspace is Class G (uncontrolled) airspace.

(See UNCONTROLLED AIRSPACE.)

**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.

(See WIND SHEAR.)

(See JET STREAM.)

**CLEAR OF THE RUNWAY–**

**a.** Taxiing aircraft, which is approaching a runway, is clear of the runway when all parts of the aircraft are held short of the applicable runway holding position marking.

**b.** A pilot or controller may consider an aircraft, which is exiting or crossing a runway, to be clear of the runway when all parts of the aircraft are beyond the runway edge and there are no restrictions to its continued movement beyond the applicable runway holding position marking.

**c.** Pilots and controllers shall exercise good judgement to ensure that adequate separation exists between all aircraft on runways and taxiways at airports with inadequate runway edge lines or holding position markings.

**CLEARANCE–**

(See AIR TRAFFIC CLEARANCE.)

**CLEARANCE LIMIT–** The fix, point, or location to which an aircraft is cleared when issued an air traffic clearance.

(See ICAO term CLEARANCE LIMIT.)

**CLEARANCE LIMIT [ICAO]–** The point to which an aircraft is granted an air traffic control clearance.

**CLEARANCE VOID IF NOT OFF BY (TIME)–**

Used by ATC to advise an aircraft that the departure clearance is automatically canceled if takeoff is not made prior to a specified time. The pilot must obtain

a new clearance or cancel his/her IFR flight plan if not off by the specified time.

(See ICAO term CLEARANCE VOID TIME.)

**CLEARANCE VOID TIME [ICAO]–** 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 airport. Normally, an aircraft will be cleared for a specific instrument approach procedure.

(See CLEARED (Type of) APPROACH.)

(See INSTRUMENT APPROACH PROCEDURE.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**CLEARED (Type of) APPROACH–** ATC authorization for an aircraft to execute a specific instrument approach procedure to an airport; e.g., “Cleared ILS Runway Three Six Approach.”

(See APPROACH CLEARANCE.)

(See INSTRUMENT APPROACH PROCEDURE.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**CLEARED AS FILED–** Means the aircraft is cleared to proceed in accordance with the route of flight filed in the flight plan. This clearance does not include the altitude, DP, or DP Transition.

(See REQUEST FULL ROUTE CLEARANCE.)

(Refer to AIM.)

**CLEARED FOR TAKEOFF–** ATC authorization for an aircraft to depart. It is predicated on known traffic and known physical airport 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. Pilots should advise ATC if they decide to remain on the runway, of any delay in their stop and go, delay clearing the runway, or are unable to comply with the instruction(s).

(See OPTION APPROACH.)

(Refer to AIM.)

**CLEARED THROUGH**– ATC authorization for an aircraft to make intermediate stops at specified airports without refiling a flight plan while en route to the clearance limit.

**CLEARED TO LAND**– ATC authorization for an aircraft to land. It is predicated on known traffic and known physical airport conditions.

**CLEARWAY**– An area beyond the takeoff runway under the control of airport authorities within which terrain or fixed obstacles may not extend above specified limits. These areas may be required for certain turbine-powered operations and the size and upward slope of the clearway will differ depending on when the aircraft was certificated.

(Refer to 14 CFR Part 1.)

**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.

(See SPECIAL VFR CONDITIONS.)

(Refer to AIM.)

**CLIMBOUT**– That portion of flight operation between takeoff and the initial cruising altitude.

**CLIMB VIA**– An abbreviated ATC clearance that requires compliance with the procedure lateral path, associated speed restrictions, and altitude restrictions along the cleared route or procedure.

**CLOSE PARALLEL RUNWAYS**– Two parallel runways whose extended centerlines are separated by less than 4,300 feet and at least 3000 feet (750 feet for SOIA operations) for which ATC is authorized to conduct simultaneous independent approach operations. PRM and simultaneous close parallel appear in approach title. Dual communications, special pilot training, an Attention All Users Page (AAUP), NTZ monitoring by displays that have aural and visual alerting algorithms are required. A high update rate surveillance sensor is required for certain runway or approach course spacing.

**CLOSED RUNWAY**– A runway that is unusable for aircraft operations. Only the airport 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.

**CLOUD**– A cloud is a visible accumulation of minute water droplets and/or ice particles in the atmosphere above the Earth's surface. Cloud differs from ground fog, fog, or ice fog only in that the latter are, by definition, in contact with the Earth's surface.

**CLT**–

(See CALCULATED LANDING TIME.)

**CLUTTER**– In radar operations, clutter refers to the reception and visual display of radar returns caused by precipitation, chaff, terrain, numerous aircraft targets, or other phenomena. Such returns may limit or preclude ATC from providing services based on radar.

(See CHAFF.)

(See GROUND CLUTTER.)

(See PRECIPITATION.)

(See TARGET.)

(See ICAO term RADAR CLUTTER.)

**CMNPS**–

(See CANADIAN MINIMUM NAVIGATION PERFORMANCE SPECIFICATION AIRSPACE.)

**COASTAL FIX**– A navigation aid or intersection where an aircraft transitions between the domestic route structure and the oceanic route structure.

**CODES**– The number assigned to a particular multiple pulse reply signal transmitted by a transponder.

(See DISCRETE CODE.)

**COLD TEMPERATURE COMPENSATION**– An action on the part of the pilot to adjust an aircraft's indicated altitude due to the effect of cold temperatures on true altitude above terrain versus aircraft indicated altitude. The amount of compensation required increases at a greater rate with a decrease in temperature and increase in height above the reporting station.

**COLLABORATIVE TRAJECTORY OPTIONS PROGRAM (CTOP)**– CTOP is a traffic management program administered by the Air Traffic Control System Command Center (ATCSCC) that manages demand through constrained airspace, while considering operator preference with regard to both route and delay as defined in a Trajectory Options Set (TOS).

**COMBINED CENTER-RAPCON**– An air traffic facility which combines the functions of an ARTCC and a radar approach control facility.

(See AIR ROUTE TRAFFIC CONTROL CENTER.)

(See RADAR APPROACH CONTROL FACILITY.)

**COMMON POINT**– A significant point over which two or more aircraft will report passing or have reported passing before proceeding on the same or diverging tracks. To establish/maintain longitudinal separation, a controller may determine a common point not originally in the aircraft's flight plan and then clear the aircraft to fly over the point.

(See SIGNIFICANT POINT.)

**COMMON PORTION**–

(See COMMON ROUTE.)

**COMMON ROUTE**– That segment of a North American Route between the inland navigation facility and the coastal fix.

## OR

**COMMON ROUTE**– Typically the portion of a RNAV STAR between the en route transition end point and the runway transition start point; however, the common route may only consist of a single point that joins the en route and runway transitions.

**COMMON TRAFFIC ADVISORY FREQUENCY (CTAF)**– A frequency designed for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower. The CTAF may be a UNICOM, Multicom, FSS, or tower frequency and is identified in appropriate aeronautical publications.

(See DESIGNATED COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) AREA.)

(Refer to AC 90-42, Traffic Advisory Practices at Airports Without Operating Control Towers.)

**COMPASS LOCATOR**– A low power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). It can be used for navigation at distances of approximately 15 miles or as authorized in the approach procedure.

**a. Outer Compass Locator (LOM)**– A compass locator installed at the site of the outer marker of an instrument landing system.

(See OUTER MARKER.)

**b. Middle Compass Locator (LMM)**– A compass locator installed at the site of the middle marker of an instrument landing system.

(See MIDDLE MARKER.)

(See ICAO term LOCATOR.)

**COMPASS ROSE**– A circle, graduated in degrees, printed on some charts or marked on the ground at an airport. It is used as a reference to either true or magnetic direction.

**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.

**COMPOSITE FLIGHT PLAN**– A flight plan which specifies VFR operation for one portion of flight and IFR for another portion. It is used primarily in military operations.

(Refer to AIM.)

**COMPULSORY REPORTING POINTS**– Reporting points which must be reported to ATC. They are designated on aeronautical charts by solid triangles or filed in a flight plan as fixes selected to define direct routes. These points are geographical locations which are defined by navigation aids/fixes. Pilots should discontinue position reporting over compulsory reporting points when informed by ATC that their aircraft is in "radar contact."

**COMPUTER NAVIGATION FIX (CNF)**– A Computer Navigation Fix is a point defined by a latitude/longitude coordinate and is required to support Performance-Based Navigation (PBN) operations. A five-letter identifier denoting a CNF can be found next to an "x" on en route charts and on some approach charts. Eventually, all CNFs will be labeled and begin with the letters "CF" followed by three consonants (e.g., 'CFWBG'). CNFs are not recognized by ATC, are not contained in ATC fix or automation databases, and are not used for ATC purposes. Pilots should not use CNFs for point-to-point navigation (e.g., proceed direct), filing a flight plan, or in aircraft/ATC communications. Use of CNFs has not been adopted or recognized by the International Civil Aviation Organization (ICAO).

(REFER to AIM 1-1-17b5(i)(2), Global Positioning System (GPS).)

**CONDITIONS NOT MONITORED**– When an airport operator cannot monitor the condition of the movement area or airfield surface area, this information is issued as a NOTAM. Usually necessitated due to staffing, operating hours or other mitigating factors associated with airport operations.

**CONFIDENCE MANEUVER**– A confidence maneuver consists of one or more turns, a climb or descent, or other maneuver to determine if the pilot in command (PIC) is able to receive and comply with ATC instructions.

**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.

(See **MODE C INTRUDER ALERT**.)

**CONFLICT RESOLUTION**– The resolution of potential conflicts between aircraft that are radar identified and in communication with ATC by ensuring that radar targets do not touch. Pertinent traffic advisories shall be issued when this procedure is applied.

Note: This procedure shall not be provided utilizing mosaic radar systems.

**CONFORMANCE**– The condition established when an aircraft's actual position is within the conformance region constructed around that aircraft at its position, according to the trajectory associated with the aircraft's Current Plan.

**CONFORMANCE REGION**– A volume, bounded laterally, vertically, and longitudinally, within which an aircraft must be at a given time in order to be in conformance with the Current Plan Trajectory for that aircraft. At a given time, the conformance region is determined by the simultaneous application of the lateral, vertical, and longitudinal conformance bounds for the aircraft at the position defined by time and aircraft's trajectory.

**CONSOLAN**– A low frequency, long-distance NAVAIID used principally for transoceanic navigations.

**CONTACT**–

a. Establish communication with (followed by the name of the facility and, if appropriate, the frequency to be used).

b. A flight condition wherein the pilot ascertains the attitude of his/her aircraft and navigates by visual reference to the surface.

(See **CONTACT APPROACH**.)

(See **RADAR CONTACT**.)

**CONTACT APPROACH**– An approach wherein an aircraft on an IFR flight plan, having an air traffic control authorization, operating clear of clouds with at least 1 mile flight visibility and a reasonable expectation of continuing to the destination airport in those conditions, may deviate from the instrument approach procedure and proceed to the destination airport by visual reference to the surface. This approach will only be authorized when requested by the pilot and the reported ground visibility at the destination airport is at least 1 statute mile.

(Refer to AIM.)

**CONTAMINATED RUNWAY**– A runway is considered contaminated whenever standing water, ice, snow, slush, frost in any form, heavy rubber, or other substances are present. A runway is contaminated with respect to rubber deposits or other friction-degrading substances when the average friction value for any 500-foot segment of the runway within the ALD fails below the recommended minimum friction level and the average friction value in the adjacent 500-foot segments falls below the maintenance planning friction level.

**CONTERMINOUS U.S.**– The 48 adjoining States and the District of Columbia.

**CONTINENTAL UNITED STATES**– The 49 States located on the continent of North America and the District of Columbia.

**CONTINGENCY HAZARD AREA (CHA)**– Used by ATC. Areas of airspace that are defined and distributed in advance of a launch or reentry operation and are activated in response to a failure.

(See **AIRCRAFT HAZARD AREA**.)

(See **REFINED HAZARD AREA**.)

(See **TRANSITIONAL HAZARD AREA**.)

**CONTINUE**– When used as a control instruction should be followed by another word or words clarifying what is expected of the pilot. Example: “continue taxi,” “continue descent,” “continue inbound,” etc.

**CONTROL AREA [ICAO]**– 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 facility. 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.

(See **DISCRETE FREQUENCY**.)

**CONTROL SLASH**– A radar beacon slash representing the actual position of the associated aircraft. Normally, the control slash is the one closest to the interrogating radar beacon site. When ARTCC radar is operating in narrowband (digitized) mode, the control slash is converted to a target symbol.

**CONTROLLED AIRSPACE**– An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.

**a.** Controlled airspace is a generic term that covers Class A, Class B, Class C, Class D, and Class E airspace.

**b.** Controlled airspace is also that airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements in 14 CFR Part 91 (for specific operating requirements, please refer to 14 CFR Part 91). For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance. Each Class B, Class C, and Class D airspace area designated for an airport contains at least one primary airport around which the airspace is designated (for specific designations and descriptions of the airspace classes, please refer to 14 CFR Part 71).

**c.** Controlled airspace in the United States is designated as follows:

**1. CLASS A**– Generally, that airspace from 18,000 feet MSL up to and including FL 600, including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.

**2. CLASS B**– Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each

Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds."

**3. CLASS C**– Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually tailored, the airspace usually consists of a surface area with a 5 nautical mile (NM) radius, a circle with a 10NM radius that extends no lower than 1,200 feet up to 4,000 feet above the airport elevation, and an outer area that is not charted. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.

(See **OUTER AREA**.)

**4. CLASS D**– Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft.

**5. CLASS E**– Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface

area, the airspace will be configured to contain all instrument procedures. Also in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska, up to, but not including 18,000 feet MSL, and the airspace above FL 600.

**CONTROLLED AIRSPACE [ICAO]**– An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.

**Note:** Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D, and E.

**CONTROLLED TIME OF ARRIVAL**– Arrival time assigned during a Traffic Management Program. This time may be modified due to adjustments or user options.

**CONTROLLER**–

(See AIR TRAFFIC CONTROL SPECIALIST.)

**CONTROLLER [ICAO]**– A person authorized to provide air traffic control services.

**CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC)**– A two-way digital communications system that conveys textual air traffic control messages between controllers and pilots using ground or satellite-based radio relay stations.

**CONVECTIVE SIGMET**– A weather advisory concerning convective weather significant to the safety of all aircraft. Convective SIGMETs are issued for tornadoes, lines of thunderstorms, embedded thunderstorms of any intensity level, areas of thunderstorms greater than or equal to VIP level 4 with an area coverage of  $\frac{4}{10}$  (40%) or more, and hail  $\frac{3}{4}$  inch or greater.

(See AIRMET.)

(See AWW.)

(See CWA.)

(See SIGMET.)

(Refer to AIM.)

**CONVECTIVE SIGNIFICANT METEOROLOGICAL INFORMATION**–

(See CONVECTIVE SIGMET.)

**COOPERATIVE SURVEILLANCE**– Any surveillance system, such as secondary surveillance radar (SSR), wide-area multilateration (WAM), or ADS-B, that is dependent upon the presence of certain equipment onboard the aircraft or vehicle to be detected.

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST.)

(See NON-COOPERATIVE SURVEILLANCE.)

(See RADAR.)

(See WIDE AREA MULTILATERATION.)

**COORDINATES**– The intersection of lines of reference, usually expressed in degrees/minutes/seconds of latitude and longitude, used to determine position or location.

**COORDINATION FIX**– The fix in relation to which facilities will handoff, transfer control of an aircraft, or coordinate flight progress data. For terminal facilities, it may also serve as a clearance for arriving aircraft.

**COPTER**–

(See HELICOPTER.)

**CORRECTION**– An error has been made in the transmission and the correct version follows.

**COUPLED APPROACH**– An instrument approach performed by the aircraft autopilot, and/or visually depicted on the flight director, which is receiving position information and/or steering commands from onboard navigational equipment. In general, coupled non-precision approaches must be flown manually (autopilot disengaged) at altitudes lower than 50 feet AGL below the minimum descent altitude, and coupled precision approaches must be flown manually (autopilot disengaged) below 50 feet AGL unless authorized to conduct autoland operations. Coupled instrument approaches are commonly flown to the allowable IFR weather minima established by the operator or PIC, or flown VFR for training and safety.

**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.

(See BEARING.)

(See INSTRUMENT LANDING SYSTEM.)

(See RADIAL.)

**CPDLC**–

(See CONTROLLER PILOT DATA LINK COMMUNICATIONS.)

**CPL [ICAO]**–

(See ICAO term CURRENT FLIGHT PLAN.)

**CRITICAL ENGINE**– The engine which, upon failure, would most adversely affect the performance or handling qualities of an aircraft.

**CROSS (FIX) AT (ALTITUDE)**– Used by ATC when a specific altitude restriction at a specified fix is required.

**CROSS (FIX) AT OR ABOVE (ALTITUDE)**– Used by ATC when an altitude restriction at a specified fix is required. It does not prohibit the aircraft from crossing the fix at a higher altitude than specified; however, the higher altitude may not be one that will violate a succeeding altitude restriction or altitude assignment.

(See ALTITUDE RESTRICTION.)

(Refer to AIM.)

**CROSS (FIX) AT OR BELOW (ALTITUDE)**– Used by ATC when a maximum crossing altitude at a specific fix is required. It does not prohibit the aircraft from crossing the fix at a lower altitude; however, it must be at or above the minimum IFR altitude.

(See ALTITUDE RESTRICTION.)

(See MINIMUM IFR ALTITUDES.)

(Refer to 14 CFR Part 91.)

**CROSSWIND**–

**a.** When used concerning the traffic pattern, the word means “crosswind leg.”

(See TRAFFIC PATTERN.)

**b.** When used concerning wind conditions, the word means a wind not parallel to the runway or the path of an aircraft.

(See CROSSWIND COMPONENT.)

**CROSSWIND COMPONENT**– The wind component measured in knots at 90 degrees to the longitudinal axis of the runway.

**CRUISE**– 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 airport and can be used in conjunction with:

**a.** An airport clearance limit at locations with a standard/special instrument approach procedure. The CFRs require that if an instrument letdown to an airport is necessary, the pilot shall make the letdown in accordance with a standard/special instrument approach procedure for that airport, or

**b.** An airport 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 airport, 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.

(See INSTRUMENT APPROACH PROCEDURE.)

**CRUISE CLIMB**– A climb technique employed by aircraft, usually at a constant power setting, resulting in an increase of altitude as the aircraft weight decreases.

**CRUISING ALTITUDE**– An altitude or flight level maintained during en route level flight. This is a constant altitude and should not be confused with a cruise clearance.

(See ALTITUDE.)

(See ICAO term CRUISING LEVEL.)

**CRUISING LEVEL**–

(See CRUISING ALTITUDE.)

**CRUISING LEVEL [ICAO]**– A level maintained during a significant portion of a flight.

**CT MESSAGE**– An EDCT time generated by the ATCSCC to regulate traffic at arrival airports. Normally, a CT message is automatically transferred from the traffic management system computer to the NAS en route computer and appears as an EDCT. In the event of a communication failure between the traffic management system computer and the NAS, the CT message can be manually entered by the TMC at the en route facility.

**CTA**–

(See CONTROLLED TIME OF ARRIVAL.)

(See ICAO term CONTROL AREA.)

**CTAF**–

(See COMMON TRAFFIC ADVISORY FREQUENCY.)

**CTAS**–

(See CENTER TRACON AUTOMATION SYSTEM.)

**CTOP**–

(See COLLABORATIVE TRAJECTORY OPTIONS PROGRAM)

**CTRD**–

(See CERTIFIED TOWER RADAR DISPLAY.)

**CURRENT FLIGHT PLAN [ICAO]**– The flight plan, including changes, if any, brought about by subsequent clearances.

**CURRENT PLAN**– The ATC clearance the aircraft has received and is expected to fly.

**CVFP APPROACH**–

(See CHARTED VISUAL FLIGHT PROCEDURE APPROACH.)

**CWA**–

(See CENTER WEATHER ADVISORY and WEATHER ADVISORY.)

and position reporting. Separation between aircraft within the formation is the responsibility of the flight leader and the pilots of the other aircraft in the flight. This includes transition periods when aircraft within the formation are maneuvering to attain separation from each other to effect individual control and during join-up and breakaway.

**a.** A standard formation is one in which a proximity of no more than 1 mile laterally or longitudinally and within 100 feet vertically from the flight leader is maintained by each wingman.

**b.** Nonstandard formations are those operating under any of the following conditions:

**1.** When the flight leader has requested and ATC has approved other than standard formation dimensions.

**2.** When operating within an authorized altitude reservation (ALTRV) or under the provisions of a letter of agreement.

**3.** When the operations are conducted in airspace specifically designed for a special activity.  
(See ALTITUDE RESERVATION.)  
(Refer to 14 CFR Part 91.)

#### ***FRC***–

(See REQUEST FULL ROUTE CLEARANCE.)

**FREEZE/FROZEN**– Terms used in referring to arrivals which have been assigned ACLTs and to the lists in which they are displayed.

**FREEZE CALCULATED LANDING TIME**– A dynamic parameter number of minutes prior to the meter fix calculated time of arrival for each aircraft when the TCLT is frozen and becomes an ACLT (i.e., the VTA is updated and consequently the TCLT is modified as appropriate until FCLT minutes prior to meter fix calculated time of arrival, at which time updating is suspended and an ACLT and a frozen meter fix crossing time (MFT) is assigned).

**FREEZE HORIZON**– The time or point at which an aircraft's STA becomes fixed and no longer fluctuates with each radar update. This setting ensures a constant time for each aircraft, necessary for the metering controller to plan his/her delay technique. This setting can be either in distance from the meter fix or a prescribed flying time to the meter fix.

**FREEZE SPEED PARAMETER**– A speed adapted for each aircraft to determine fast and slow aircraft.

Fast aircraft freeze on parameter FCLT and slow aircraft freeze on parameter MLDI.

**FRICTION MEASUREMENT**– A measurement of the friction characteristics of the runway pavement surface using continuous self-watering friction measurement equipment in accordance with the specifications, procedures and schedules contained in AC 150/5320–12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces.

#### **FSDO**–

(See FLIGHT STANDARDS DISTRICT OFFICE.)

#### **FSPD**–

(See FREEZE SPEED PARAMETER.)

#### **FSS**–

(See FLIGHT SERVICE STATION.)

**FUEL DUMPING**– Airborne release of usable fuel. This does not include the dropping of fuel tanks.

(See JETTISONING OF EXTERNAL STORES.)

**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 initiated cautionary advisory 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.

**FUEL SIPHONING**– Unintentional release of fuel caused by overflow, puncture, loose cap, etc.

#### **FUEL VENTING**–

(See FUEL SIPHONING.)

#### **FUSED TARGET**–

(See DIGITAL TARGET)

**FUSION [STARS]**– the combination of all available surveillance sources (airport surveillance radar [ASR], air route surveillance radar [ARSR], ADS-B, etc.) into the display of a single tracked target for air traffic control separation services. FUSION is the equivalent of the current single-sensor radar display. FUSION performance is characteristic of a single-sensor radar display system. Terminal areas use mono-pulse secondary surveillance radar (ASR 9, Mode S or ASR 11, MSSR).



# G

**GATE HOLD PROCEDURES**– Procedures at selected airports to hold aircraft at the gate or other ground location whenever departure delays exceed or are anticipated to exceed 15 minutes. The sequence for departure will be maintained in accordance with initial call-up unless modified by flow control restrictions. Pilots should monitor the ground control/clearance delivery frequency for engine start/taxi advisories or new proposed start/taxi time if the delay changes.

**GCA**–

(See **GROUND CONTROLLED APPROACH**.)

**GDP**–

(See **GROUND DELAY PROGRAM**.)

**GENERAL AVIATION**– That portion of civil aviation that does not include scheduled or unscheduled air carriers or commercial space operations.

(See ICAO term **GENERAL AVIATION**.)

**GENERAL AVIATION [ICAO]**– All civil aviation operations other than scheduled air services and nonscheduled air transport operations for remuneration or hire.

**GEO MAP**– The digitized map markings associated with the ASR-9 Radar System.

**GLIDEPATH**–

(See **GLIDESLOPE**.)

**GLIDEPATH [ICAO]**– A descent profile determined for vertical guidance during a final approach.

**GLIDEPATH INTERCEPT ALTITUDE**–

(See **GLIDESLOPE INTERCEPT ALTITUDE**.)

**GLIDESLOPE**– Provides vertical guidance for aircraft during approach and landing. The glideslope/glidepath 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.

(See ICAO term **GLIDEPATH**.)

**GLIDESLOPE INTERCEPT ALTITUDE**– The published minimum altitude to intercept the glideslope in the intermediate segment of an instrument approach. Government charts use the lightning bolt symbol to identify this intercept point. This intersection is called the Precise Final Approach fix (PFAF). ATC directs a higher altitude, the resultant intercept becomes the PFAF.

(See **FINAL APPROACH FIX**.)

(See **SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE**.)

**GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)**– GNSS refers collectively to the worldwide positioning, navigation, and timing determination capability available from one or more satellite constellations. A GNSS constellation may be augmented by ground stations and/or geostationary satellites to improve integrity and position accuracy.

(See **GROUND-BASED AUGMENTATION SYSTEM**.)

(See **SATELLITE-BASED AUGMENTATION SYSTEM**.)

**GLOBAL NAVIGATION SATELLITE SYSTEM MINIMUM EN ROUTE IFR ALTITUDE (GNSS MEA)**– The minimum en route IFR altitude on a published ATS route or route segment which assures acceptable Global Navigation Satellite System reception and meets obstacle clearance requirements. (Refer to 14 CFR Part 91.) (Refer to 14 CFR Part 95.)

**GLOBAL POSITIONING SYSTEM (GPS)**– GPS refers to the worldwide positioning, navigation and timing determination capability available from the U.S. satellite constellation. The service provided by GPS for civil use is defined in the GPS Standard Positioning System Performance Standard. GPS is composed of space, control, and user elements.

**GNSS [ICAO]–**

(See GLOBAL NAVIGATION SATELLITE SYSTEM.)

**GNSS MEA–**

(See GLOBAL NAVIGATION SATELLITE SYSTEM MINIMUM EN ROUTE IFR ALTITUDE.)

**GO AHEAD–** Proceed with your message. Not to be used for any other purpose.

**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 pattern altitude and enter the traffic pattern 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).

(See LOW APPROACH.)

(See MISSED APPROACH.)

**GPD–**

(See GRAPHIC PLAN DISPLAY.)

**GPS–**

(See GLOBAL POSITIONING SYSTEM.)

**GRAPHIC PLAN DISPLAY (GPD)–** A view available with EDST that provides a graphic display of aircraft, traffic, and notification of predicted conflicts. Graphic routes for Current Plans and Trial Plans are displayed upon controller request.

(See EN ROUTE DECISION SUPPORT TOOL.)

**GROSS NAVIGATION ERROR (GNE) –** A lateral deviation from a cleared track, normally in excess of 25 Nautical Miles (NM). More stringent standards (for example, 10NM in some parts of the North Atlantic region) may be used in certain regions to support reductions in lateral separation.

**GROUND BASED AUGMENTATION SYSTEM (GBAS)–** A ground based GNSS station which provides local differential corrections, integrity parameters and approach data via VHF data broadcast to GNSS users to meet real-time performance requirements for CAT I precision approaches. The aircraft applies the broadcast data to improve the accuracy and integrity of its GNSS signals and

computes the deviations to the selected approach. A single ground station can serve multiple runway ends up to an approximate radius of 23 NM.

**GROUND BASED AUGMENTATION SYSTEM (GBAS) LANDING SYSTEM (GLS)–** A type of precision IAP based on local augmentation of GNSS data using a single GBAS station to transmit locally corrected GNSS data, integrity parameters and approach information. This improves the accuracy of aircraft GNSS receivers’ signal in space, enabling the pilot to fly a precision approach with much greater flexibility, reliability and complexity. The GLS procedure is published on standard IAP charts, features the title GLS with the designated runway and minima as low as 200 feet DA. Future plans are expected to support Cat II and CAT III operations.

**GROUND CLUTTER–** A pattern produced on the radar scope by ground returns which may degrade other radar returns in the affected area. The effect of ground clutter is minimized by the use of moving target indicator (MTI) circuits in the radar equipment resulting in a radar presentation which displays only targets which are in motion.

(See CLUTTER.)

**GROUND COMMUNICATION OUTLET (GCO)–**

An unstaffed, remotely controlled, ground/ground communications facility. Pilots at uncontrolled airports may contact ATC and FSS via VHF to a telephone connection to obtain an instrument clearance or close a VFR or IFR flight plan. They may also get an updated weather briefing prior to takeoff. Pilots will use four “key clicks” on the VHF radio to contact the appropriate ATC facility or six “key clicks” to contact the FSS. The GCO system is intended to be used only on the ground.

**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 facility. Pilots should specifically request a “PAR” approach when a precision radar approach is desired or request an “ASR” or “surveillance” approach when a nonprecision radar approach is desired.

(See RADAR APPROACH.)

**GROUND DELAY PROGRAM (GDP)**– A traffic management process administered by the ATCSCC, when aircraft are held on the ground. The purpose of the program is to support the TM mission and limit airborne holding. It is a flexible program and may be implemented in various forms depending upon the needs of the AT system. Ground delay programs provide for equitable assignment of delays to all system users.

**GROUND SPEED**– The speed of an aircraft relative to the surface of the earth.

**GROUND STOP (GS)**– The GS is a process that

requires aircraft that meet a specific criteria to remain on the ground. The criteria may be airport specific, airspace specific, or equipment specific; for example, all departures to San Francisco, or all departures entering Yorktown sector, or all Category I and II aircraft going to Charlotte. GSs normally occur with little or no warning.

**GROUND VISIBILITY**–

(See VISIBILITY.)

**GS**–

(See GROUND STOP.)



# H

## HAA–

(See HEIGHT ABOVE AIRPORT.)

## HAL–

(See HEIGHT ABOVE LANDING.)

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

## HAR–

(See HIGH ALTITUDE REDESIGN.)

## HAT–

(See HEIGHT ABOVE TOUCHDOWN.)

**HAVE NUMBERS**– Used by pilots to inform ATC that they have received runway, wind, and altimeter information only.

## HAZARDOUS WEATHER INFORMATION–

Summary of significant meteorological information (SIGMET/WS), convective significant meteorological information (convective SIGMET/WST), urgent pilot weather reports (urgent PIREP/UUA), center weather advisories (CWA), airmen's meteorological information (AIRMET/WA) and any other weather such as isolated thunderstorms that are rapidly developing and increasing in intensity, or low ceilings and visibilities that are becoming widespread which is considered significant and are not included in a current hazardous weather advisory.

## HEAVY (AIRCRAFT)–

(See AIRCRAFT CLASSES.)

**HEIGHT ABOVE AIRPORT (HAA)**– The height of the Minimum Descent Altitude above the published airport elevation. This is published in conjunction with circling minimums.

(See MINIMUM DESCENT ALTITUDE.)

**HEIGHT ABOVE LANDING (HAL)**– The height above a designated helicopter landing area used for helicopter instrument approach procedures.

(Refer to 14 CFR Part 97.)

**HEIGHT ABOVE TOUCHDOWN (HAT)**– The height of the Decision Height or Minimum Descent Altitude above the highest runway elevation in the

touchdown zone (first 3,000 feet of the runway). HAT is published on instrument approach charts in conjunction with all straight-in minimums.

(See DECISION HEIGHT.)

(See MINIMUM DESCENT ALTITUDE.)

**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, airport, landing/take-off area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters.

**HELIPORT**– An area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters and includes its buildings and facilities if any.

**HELIPORT REFERENCE POINT (HRP)**– The geographic center of a heliport.

**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.

## HF–

(See HIGH FREQUENCY.)

## HF COMMUNICATIONS–

(See HIGH FREQUENCY COMMUNICATIONS.)

**HIGH ALTITUDE REDESIGN (HAR)**– A level of non-restrictive routing (NRR) service for aircraft that have all waypoints associated with the HAR program in their flight management systems or RNAV equipage.

**HIGH FREQUENCY**– The frequency band between 3 and 30 MHz.

(See HIGH FREQUENCY COMMUNICATIONS.)

**HIGH FREQUENCY COMMUNICATIONS**– High radio frequencies (HF) between 3 and 30 MHz used for air-to-ground voice communication in overseas operations.

## HIGH SPEED EXIT–

(See HIGH SPEED TAXIWAY.)

**HIGH SPEED TAXIWAY**– A long radius taxiway designed and provided with lighting or marking to define the path of aircraft, traveling at high speed (up to 60 knots), from the runway center to a point on the center 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.

**HIGH SPEED TURNOFF**–

(See HIGH SPEED TAXIWAY.)

**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.

(See ICAO term HOLDING POINT.)

**HOLD-IN-LIEU OF PROCEDURE TURN**– A hold-in-lieu of procedure turn shall be established over a final or intermediate fix when an approach can be made from a properly aligned holding pattern. The hold-in-lieu of procedure turn permits the pilot to align with the final or intermediate segment of the approach and/or descend in the holding pattern to an altitude that will permit a normal descent to the final approach fix altitude. The hold-in-lieu of procedure turn is a required maneuver (the same as a procedure turn) unless the aircraft is being radar vectored to the final approach course, when “NoPT” is shown on the approach chart, or when the pilot requests or the controller advises the pilot to make a “straight-in” approach.

**HOLD PROCEDURE**– A predetermined maneuver which keeps aircraft within a specified airspace while awaiting further clearance from air traffic control. Also used during ground operations to keep aircraft within a specified area or at a specified point while awaiting further clearance from air traffic control.

(See HOLDING FIX.)

(Refer to AIM.)

**HOLDING FIX**– A specified fix identifiable to a pilot by NAVAIDs or visual reference to the ground

used as a reference point in establishing and maintaining the position of an aircraft while holding.

(See FIX.)

(See VISUAL HOLDING.)

(Refer to AIM.)

**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.

**HOLDING PROCEDURE**–

(See HOLD PROCEDURE.)

**HOLD-SHORT POINT**– A point on the runway beyond which a landing aircraft with a LAHSO clearance is not authorized to proceed. This point may be located prior to an intersecting runway, taxiway, predetermined point, or approach/departure flight path.

**HOLD-SHORT POSITION LIGHTS**– Flashing in-pavement white lights located at specified hold-short points.

**HOLD-SHORT POSITION MARKING**– The painted runway marking located at the hold-short point on all LAHSO runways.

**HOLD-SHORT POSITION SIGNS**– Red and white holding position signs located alongside the hold-short point.

**HOMING**– Flight toward a NAVAID, without correcting for wind, by adjusting the aircraft heading to maintain a relative bearing of zero degrees.

(See BEARING.)

(See ICAO term HOMING.)

**HOMING [ICAO]**– The procedure of using the direction-finding equipment of one radio station with the emission of another radio station, where at least one of the stations is mobile, and whereby the mobile station proceeds continuously towards the other station.

**HOVER CHECK**– Used to describe when a helicopter/VTOL aircraft requires a stabilized hover to conduct a performance/power check prior to hover taxi, air taxi, or takeoff. Altitude of the hover will vary based on the purpose of the check.

**HOVER TAXI**– Used to describe a helicopter/VTOL aircraft movement conducted above the surface and in ground effect at airspeeds less than approximately

20 knots. The actual height may vary, and some helicopters may require hover taxi above 25 feet AGL to reduce ground effect turbulence or provide clearance for cargo slingloads.

(See AIR TAXI.)

(See HOVER CHECK.)

(Refer to AIM.)

***HOW DO YOU HEAR ME?***– A question relating to the quality of the transmission or to determine how well the transmission is being received.

HZ–

(See HERTZ.)



# I

***I SAY AGAIN***– The message will be repeated.

**IAF**–

(See INITIAL APPROACH FIX.)

**IAP**–

(See INSTRUMENT APPROACH PROCEDURE.)

**IAWP**– Initial Approach Waypoint

**ICAO**–

(See ICAO Term INTERNATIONAL CIVIL AVIATION ORGANIZATION.)

**ICAO 3LD**–

(See ICAO Term ICAO Three–Letter Designator)

**ICAO Three–Letter Designator (3LD)**– An ICAO 3LD is an exclusive designator that, when used together with a flight number, becomes the aircraft call sign and provides distinct aircraft identification to air traffic control (ATC). ICAO approves 3LDs to enhance the safety and security of the air traffic system. An ICAO 3LD may be assigned to a company, agency, or organization and is used instead of the aircraft registration number for ATC operational and security purposes. An ICAO 3LD is also used for aircraft identification in the flight plan and associated messages and can be used for domestic and international flights. A telephony associated with an ICAO 3LD is used for radio communication.

**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 of 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. Deicing/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 deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.

**c. Moderate**– The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or flight diversion is necessary.

**d. Severe**– The rate of ice accumulation is such that ice protection systems fail to remove the accumulation of ice, or ice accumulates in locations not normally prone to icing, such as areas aft of protected surfaces and any other areas identified by the manufacturer. Immediate exit from the condition is necessary.

**Note:**

Severe icing is aircraft dependent, as are the other categories of icing intensity. Severe icing may occur at any ice accumulation rate when the icing rate or ice accumulations exceed the tolerance of the aircraft.

***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.

(Refer to AIM.)

**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.

(See IDENT.)

**IDENTIFICATION [ICAO]**– The situation which exists when the position indication of a particular aircraft is seen on a situation display and positively identified.

**IF**–

(See INTERMEDIATE FIX.)

***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.

(See LOST COMMUNICATIONS.)

**IFR**–

(See INSTRUMENT FLIGHT RULES.)

**IFR AIRCRAFT**– An aircraft conducting flight in accordance with instrument flight rules.

**IFR CONDITIONS**– Weather conditions below the minimum for flight under visual flight rules.

(See **INSTRUMENT METEOROLOGICAL CONDITIONS**.)

**IFR DEPARTURE PROCEDURE**–

(See **IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES**.)

(Refer to AIM.)

**IFR FLIGHT**–

(See **IFR AIRCRAFT**.)

**IFR LANDING MINIMUMS**–

(See **LANDING MINIMUMS**.)

**IFR MILITARY TRAINING ROUTES (IR)**– Routes used by the Department of Defense and associated Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training in both IFR and VFR weather conditions below 10,000 feet MSL at airspeeds in excess of 250 knots IAS.

**IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES**– Title 14 Code of Federal Regulations Part 91, prescribes standard takeoff rules for certain civil users. At some airports, obstructions or other factors require the establishment of nonstandard takeoff minimums, departure procedures, or both to assist pilots in avoiding obstacles during climb to the minimum en route altitude. Those airports are listed in FAA/DOD Instrument Approach Procedures (IAPs) Charts under a section entitled “IFR Takeoff Minimums and Departure Procedures.” The FAA/DOD IAP chart legend illustrates the symbol used to alert the pilot to nonstandard takeoff minimums and departure procedures. When departing IFR from such airports or from any airports where there are no departure procedures, DPs, or ATC facilities available, pilots should advise ATC of any departure limitations. Controllers may query a pilot to determine acceptable departure directions, turns, or headings after takeoff. Pilots should be familiar with the departure procedures and must assure that their aircraft can meet or exceed any specified climb gradients.

**IF/IAWP**– Intermediate Fix/Initial Approach Waypoint. The waypoint where the final approach course of a T approach meets the crossbar of the T. When

designated (in conjunction with a TAA) this waypoint will be used as an IAWP when approaching the airport from certain directions, and as an IFWP when beginning the approach from another IAWP.

**IFWP**– Intermediate Fix Waypoint

**ILS**–

(See **INSTRUMENT LANDING SYSTEM**.)

**ILS CATEGORIES**– 1. Category I. An ILS approach procedure which provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1,800 feet.– 2. Special Authorization Category I. An ILS approach procedure which provides for approach to a height above touchdown of not less than 150 feet and with runway visual range of not less than 1,400 feet, HUD to DH. 3. Category II. An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet (with autoland or HUD to touchdown and noted on authorization, RVR 1,000 feet).– 4. Special Authorization Category II with Reduced Lighting. An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet with autoland or HUD to touchdown and noted on authorization (no touchdown zone and centerline lighting are required).– 5. Category III:

a. **IIIA**.–An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 700 feet.

b. **IIIB**.–An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 150 feet.

c. **IIIC**.–An ILS approach procedure which provides for approach without a decision height minimum and without runway visual range minimum.

**IM**–

(See **INNER MARKER**.)

**IMC**–

(See **INSTRUMENT METEOROLOGICAL CONDITIONS**.)

**IMMEDIATELY**– Used by ATC or pilots when such action compliance is required to avoid an imminent situation.

**INCERFA (Uncertainty Phase) [ICAO]**– A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

**INCREASED SEPARATION REQUIRED (ISR)**– Indicates the confidence level of the track requires 5NM separation. 3NM separation, 1 1/2NM separation, and target resolution cannot be used.

***INCREASE SPEED TO (SPEED)***–  
(See **SPEED ADJUSTMENT**.)

**INERTIAL NAVIGATION SYSTEM (INS)**– An RNAV system which is a form of self-contained navigation.  
(See **Area Navigation/RNAV**.)

**INFLIGHT REFUELING**–  
(See **AERIAL REFUELING**.)

**INFLIGHT WEATHER ADVISORY**–  
(See **WEATHER ADVISORY**.)

**INFORMATION REQUEST (INREQ)**– A request originated by an FSS for information concerning an overdue VFR aircraft.

**INITIAL APPROACH FIX (IAF)**– The fixes depicted on instrument approach procedure charts that identify the beginning of the initial approach segment(s).  
(See **FIX**.)  
(See **SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE**.)

**INITIAL APPROACH SEGMENT**–  
(See **SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE**.)

**INITIAL APPROACH SEGMENT [ICAO]**– That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

**INLAND NAVIGATION FACILITY**– A navigation aid on a North American Route at which the common route and/or the noncommon route begins or ends.

**INNER MARKER**– A marker beacon used with an ILS (CAT II) precision approach located between the middle marker and the end of the ILS runway, transmitting a radiation pattern keyed at six dots per second and indicating to the pilot, both aurally and visually, that he/she is at the designated decision height (DH), normally 100 feet above the touchdown

zone elevation, on the ILS CAT II approach. It also marks progress during a CAT III approach.

(See **INSTRUMENT LANDING SYSTEM**.)  
(Refer to **AIM**.)

**INNER MARKER BEACON**–  
(See **INNER MARKER**.)

**INREQ**–  
(See **INFORMATION REQUEST**.)

**INS**–  
(See **INERTIAL NAVIGATION SYSTEM**.)

**INSTRUMENT APPROACH**–  
(See **INSTRUMENT APPROACH PROCEDURE**.)

**INSTRUMENT APPROACH OPERATIONS [ICAO]**– An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

**a.** A two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and

**b.** A three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

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

- a) a ground-based radio navigation aid; or
- b) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.

(See **ICAO term INSTRUMENT APPROACH PROCEDURE**.)

**INSTRUMENT APPROACH PROCEDURE**– A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

(See **SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE**.)

(Refer to **14 CFR Part 91**.)

(Refer to **AIM**.)

**a.** U.S. civil standard instrument approach procedures are approved by the FAA as prescribed under **14 CFR Part 97** and are available for public use.

**b.** U.S. military standard instrument approach procedures are approved and published by the Department of Defense.

**c.** Special instrument approach procedures are approved by the FAA for individual operators but are not published in 14 CFR Part 97 for public use.

(See ICAO term INSTRUMENT APPROACH PROCEDURE.)

**INSTRUMENT APPROACH PROCEDURE [ICAO]**– 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.

(See ICAO term INSTRUMENT APPROACH OPERATIONS)

**INSTRUMENT APPROACH PROCEDURE CHARTS**–

(See AERONAUTICAL CHART.)

**INSTRUMENT DEPARTURE PROCEDURE (DP)**– A preplanned instrument flight rule (IFR) departure procedure published for pilot use, in graphic or textual format, that provides obstruction clearance from the terminal area to the appropriate en route structure. There are two types of DP, Obstacle Departure Procedure (ODP), printed either textually or graphically, and, Standard Instrument Departure (SID), which is always printed graphically.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See OBSTACLE DEPARTURE PROCEDURES.)

(See STANDARD INSTRUMENT DEPARTURES.)

(Refer to AIM.)

**INSTRUMENT DEPARTURE PROCEDURE (DP) CHARTS**–

(See AERONAUTICAL CHART.)

**INSTRUMENT FLIGHT RULES (IFR)**– Rules governing the procedures for conducting instrument

flight. Also a term used by pilots and controllers to indicate type of flight plan.

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

(See VISUAL FLIGHT RULES.)

(See VISUAL METEOROLOGICAL CONDITIONS.)

(See ICAO term INSTRUMENT FLIGHT RULES.)

(Refer to AIM.)

**INSTRUMENT FLIGHT RULES [ICAO]**– A set of rules governing the conduct of flight under instrument meteorological conditions.

**INSTRUMENT LANDING SYSTEM (ILS)**– A precision instrument approach system which normally consists of the following electronic components and visual aids:

**a.** Localizer.

(See LOCALIZER.)

**b.** Glideslope.

(See GLIDESLOPE.)

**c.** Outer Marker.

(See OUTER MARKER.)

**d.** Middle Marker.

(See MIDDLE MARKER.)

**e.** Approach Lights.

(See AIRPORT LIGHTING.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**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.

(See INSTRUMENT FLIGHT RULES.)

(See VISUAL FLIGHT RULES.)

(See VISUAL METEOROLOGICAL CONDITIONS.)

**INSTRUMENT RUNWAY**– A runway equipped with electronic and visual navigation aids for which a precision or nonprecision approach procedure having straight-in landing minimums has been approved.

(See ICAO term INSTRUMENT RUNWAY.)

**INSTRUMENT RUNWAY [ICAO]**– One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

**a. Nonprecision Approach Runway**– An instrument runway served by visual aids and a nonvisual aid providing at least directional guidance adequate for a straight-in approach.

**b. Precision Approach Runway, Category I**– An instrument runway served by ILS and visual aids intended for operations down to 60 m (200 feet) decision height and down to an RVR of the order of 800 m.

**c. Precision Approach Runway, Category II**– An instrument runway served by ILS and visual aids intended for operations down to 30 m (100 feet) decision height and down to an RVR of the order of 400 m.

**d. Precision Approach Runway, Category III**– An instrument runway served by ILS to and along the surface of the runway and:

**1.** Intended for operations down to an RVR of the order of 200 m (no decision height being applicable) using visual aids during the final phase of landing;

**2.** Intended for operations down to an RVR of the order of 50 m (no decision height being applicable) using visual aids for taxiing;

**3.** Intended for operations without reliance on visual reference for landing or taxiing.

Note 1: See Annex 10 Volume I, Part I, Chapter 3, for related ILS specifications.

Note 2: Visual aids need not necessarily be matched to the scale of nonvisual aids provided. The criterion for the selection of visual aids is the conditions in which operations are intended to be conducted.

**INTEGRITY**– The ability of a system to provide timely warnings to users when the system should not be used for navigation.

**INTERMEDIATE APPROACH SEGMENT**–  
(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**INTERMEDIATE APPROACH SEGMENT [ICAO]**– 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 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).

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**INTERMEDIATE LANDING**– On the rare occasion that this option is requested, it should be approved. The departure center, however, must advise the ATCSCC so that the appropriate delay is carried over and assigned at the intermediate airport. An intermediate landing airport within the arrival center will not be accepted without coordination with and the approval of the ATCSCC.

**INTERNATIONAL AIRPORT**– Relating to international flight, it means:

**a.** An airport of entry which has been designated by the Secretary of Treasury or Commissioner of Customs as an international airport for customs service.

**b.** A landing rights airport at which specific permission to land must be obtained from customs authorities in advance of contemplated use.

**c.** Airports designated under the Convention on International Civil Aviation as an airport for use by international commercial air transport and/or international general aviation.

(See ICAO term INTERNATIONAL AIRPORT.)  
(Refer to Chart Supplement U.S.)

**INTERNATIONAL AIRPORT [ICAO]**– Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

**INTERNATIONAL CIVIL AVIATION ORGANIZATION [ICAO]**– A specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.

**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). Also, applied to the airborne element of the TACAN/DME system.

(See TRANSPONDER.)

(Refer to AIM.)

**INTERSECTING RUNWAYS**– Two or more runways which cross or meet within their lengths.

(See INTERSECTION.)

**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.

(See INTERSECTION.)

**INTERSECTION TAKEOFF**–

(See INTERSECTION DEPARTURE.)

**IR**–

(See IFR MILITARY TRAINING ROUTES.)

**IRREGULAR SURFACE**– A surface that is open for use but not per regulations.

**ISR**–

(See INCREASED SEPARATION REQUIRED.)

# J

**JAMMING**– Denotes emissions that do not mimic Global Navigation Satellite System (GNSS) signals (e.g., GPS and WAAS), but rather interfere with the civil receiver’s ability to acquire and track GNSS signals. Jamming can result in denial of GNSS navigation, positioning, timing and aircraft dependent functions.

**JET BLAST**– The rapid air movement produced by exhaust from jet engines.

**JET ROUTE**– A route designed to serve aircraft operations from 18,000 feet MSL up to and including flight level 450. The routes are referred to as “J” routes with numbering to identify the designated route; e.g., J105.

(See Class A AIRSPACE.)

(Refer to 14 CFR Part 71.)

**JET STREAM**– A migrating stream of high-speed winds present at high altitudes.

**JETTISONING OF EXTERNAL STORES**– Airborne release of external stores; e.g., tiptanks, ordnance.

(See FUEL DUMPING.)

(Refer to 14 CFR Part 91.)

**JOINT USE RESTRICTED AREA**–

(See RESTRICTED AREA.)

**JUMP ZONE**– The airspace directly associated with a Drop Zone. Vertical and horizontal limits may be locally defined.



# N

**NAS–**

(See NATIONAL AIRSPACE SYSTEM.)

**NAT HLA–**

(See NORTH ATLANTIC HIGH LEVEL AIRSPACE.)

**NATIONAL AIRSPACE SYSTEM–** The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. Included are system components shared jointly with the military.

**NATIONAL BEACON CODE ALLOCATION PLAN AIRSPACE (NBCAP)–** Airspace over United States territory located within the North American continent between Canada and Mexico, including adjacent territorial waters outward to about boundaries of oceanic control areas (CTA)/Flight Information Regions (FIR).

(See FLIGHT INFORMATION REGION.)

**NATIONAL FLIGHT DATA CENTER (NFDC)–** A facility in Washington D.C., established by FAA to operate a central aeronautical information service for the collection, validation, and dissemination of aeronautical data in support of the activities of government, industry, and the aviation community. The information is published in the National Flight Data Digest.

(See NATIONAL FLIGHT DATA DIGEST.)

**NATIONAL FLIGHT DATA DIGEST (NFDD)–** A daily (except weekends and Federal holidays) publication of flight information appropriate to aeronautical charts, aeronautical publications, Notices to Airmen, or other media serving the purpose of providing operational flight data essential to safe and efficient aircraft operations.

**NATIONAL SEARCH AND RESCUE PLAN–** An interagency agreement which provides for the effective utilization of all available facilities in all types of search and rescue missions.

**NAVAID–**

(See NAVIGATIONAL AID.)

**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.

Note: The normal service range for T, L, and H class aids is found in the AIM. Certain operational requirements make it necessary to use some of these aids at greater service ranges than specified. Extended range is made possible through flight inspection determinations. Some aids also have lesser service range due to location, terrain, frequency protection, etc. Restrictions to service range are listed in Chart Supplement U.S.

**NAVIGABLE AIRSPACE–** Airspace at and above the minimum flight altitudes prescribed in the CFRs including airspace needed for safe takeoff and landing.

(Refer to 14 CFR Part 91.)

**NAVIGATION REFERENCE SYSTEM (NRS)–** The NRS is a system of waypoints developed for use within the United States for flight planning and navigation without reference to ground based navigational aids. The NRS waypoints are located in a grid pattern along defined latitude and longitude lines. The initial use of the NRS will be in the high altitude environment in conjunction with the High Altitude Redesign initiative. The NRS waypoints are intended for use by aircraft capable of point-to-point navigation.

**NAVIGATION SPECIFICATION [ICAO]–** A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

a. RNP specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP; e.g., RNP 4, RNP APCH.

b. RNAV specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alert-

ing, designated by the prefix RNAV; e.g., RNAV 5, RNAV 1.

**Note:** The Performance-based Navigation Manual (Doc 9613), Volume II contains detailed guidance on navigation specifications.

**NAVIGATIONAL 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.

(See AIR NAVIGATION FACILITY.)

**NAVSPEC**–

(See NAVIGATION SPECIFICATION [ICAO].)

**NBCAP AIRSPACE**–

(See NATIONAL BEACON CODE ALLOCATION PLAN AIRSPACE.)

**NDB**–

(See NONDIRECTIONAL BEACON.)

**NEGATIVE**– “No,” or “permission not granted,” or “that is not correct.”

**NEGATIVE CONTACT**– Used by pilots to inform ATC that:

a. Previously issued traffic is not in sight. It may be followed by the pilot’s request for the controller to provide assistance in avoiding the traffic.

b. They were unable to contact ATC on a particular frequency.

**NFDC**–

(See NATIONAL FLIGHT DATA CENTER.)

**NFDD**–

(See NATIONAL FLIGHT DATA DIGEST.)

**NIGHT**– The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the Air Almanac, converted to local time.

(See ICAO term NIGHT.)

**NIGHT [ICAO]**– The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be specified by the appropriate authority.

**Note:** Civil twilight ends in the evening when the center of the sun’s disk is 6 degrees below the horizon and begins in the morning when the center of the sun’s disk is 6 degrees below the horizon.

**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.

(Refer to AIM.)

**NO GYRO VECTOR**–

(See NO GYRO APPROACH.)

**NO TRANSGRESSION ZONE (NTZ)**– The NTZ is a 2,000 foot wide zone, located equidistant between parallel runway or SOIA final approach courses, in which flight is normally not allowed.

**NONAPPROACH CONTROL TOWER**– Authorizes aircraft to land or takeoff at the airport controlled by the tower or to transit the Class D airspace. The primary function of a nonapproach control tower is the sequencing of aircraft in the traffic pattern and on the landing area. Nonapproach control towers also separate aircraft operating under instrument flight rules clearances from approach controls and centers. They provide ground control services to aircraft, vehicles, personnel, and equipment on the airport movement area.

**NONCOMMON ROUTE/PORTION**– That segment of a North American Route between the inland navigation facility and a designated North American terminal.

**NON-COOPERATIVE SURVEILLANCE**– Any surveillance system, such as primary radar, that is not dependent upon the presence of any equipment on the aircraft or vehicle to be tracked.

(See COOPERATIVE SURVEILLANCE.)

(See RADAR.)

**NONDIRECTIONAL BEACON**– An L/MF or UHF radio beacon transmitting nondirectional 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.

(See AUTOMATIC DIRECTION FINDER.)

(See COMPASS LOCATOR.)

**NONMOVEMENT AREAS**– Taxiways and apron (ramp) areas not under the control of air traffic.

**NONPRECISION APPROACH–**

(See NONPRECISION APPROACH PROCEDURE.)

**NONPRECISION APPROACH PROCEDURE–** A standard instrument approach procedure in which no electronic glideslope is provided; e.g., VOR, TACAN, NDB, LOC, ASR, LDA, or SDF approaches.

**NONRADAR–** Precedes other terms and generally means without the use of radar, such as:

**a. Nonradar 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 approach course may or may not be provided by ATC. Examples of nonradar approaches are VOR, NDB, TACAN, ILS, RNAV, and GLS approaches.

(See FINAL APPROACH COURSE.)

(See FINAL APPROACH-IFR.)

(See INSTRUMENT APPROACH PROCEDURE.)

(See RADAR APPROACH.)

**b. Nonradar Approach Control.** An ATC facility providing approach control service without the use of radar.

(See APPROACH CONTROL FACILITY.)

(See APPROACH CONTROL SERVICE.)

**c. Nonradar Arrival.** An aircraft arriving at an airport without radar service or at an airport served by a radar facility and radar contact has not been established or has been terminated due to a lack of radar service to the airport.

(See RADAR ARRIVAL.)

(See RADAR SERVICE.)

**d. Nonradar 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 nonradar route.

(See RADAR ROUTE.)

**e. Nonradar Separation.** The spacing of aircraft in accordance with established minima without the use of radar; e.g., vertical, lateral, or longitudinal separation.

(See RADAR SEPARATION.)

**NON-RESTRICTIVE ROUTING (NRR)–** Portions of a proposed route of flight where a user can flight

plan the most advantageous flight path with no requirement to make reference to ground-based NAVAIDs.

**NOPAC–**

(See NORTH PACIFIC.)

**NORDO** (No Radio)– Aircraft that cannot or do not communicate by radio when radio communication is required are referred to as “NORDO.”

(See LOST COMMUNICATIONS.)

**NORMAL OPERATING ZONE (NOZ)–** The NOZ is the operating zone within which aircraft flight remains during normal independent simultaneous parallel ILS approaches.

**NORTH AMERICAN ROUTE–** A numerically coded route preplanned over existing airway and route systems to and from specific coastal fixes serving the North Atlantic. North American Routes consist of the following:

**a. Common Route/Portion.** That segment of a North American Route between the inland navigation facility and the coastal fix.

**b. Noncommon Route/Portion.** That segment of a North American Route between the inland navigation facility and a designated North American terminal.

**c. Inland Navigation Facility.** A navigation aid on a North American Route at which the common route and/or the noncommon route begins or ends.

**d. Coastal Fix.** A navigation aid or intersection where an aircraft transitions between the domestic route structure and the oceanic route structure.

**NORTH AMERICAN ROUTE PROGRAM (NRP)–** The NRP is a set of rules and procedures which are designed to increase the flexibility of user flight planning within published guidelines.

**NORTH ATLANTIC HIGH LEVEL AIRSPACE (NAT HLA)–** That volume of airspace (as defined in ICAO Document 7030) between FL 285 and FL 420 within the Oceanic Control Areas of Bodo Oceanic, Gander Oceanic, New York Oceanic East, Reykjavik, Santa Maria, and Shanwick, excluding the Shannon and Brest Ocean Transition Areas. ICAO Doc 007 *North Atlantic Operations and Airspace Manual* provides detailed information on related aircraft and operational requirements.

**NORTH MARK**– A beacon data block sent by the host computer to be displayed by the ARTS on a 360 degree bearing at a locally selected radar azimuth and distance. The North Mark is used to ensure correct range/azimuth orientation during periods of CENRAP.

**NORTH PACIFIC**– An organized route system between the Alaskan west coast and Japan.

**NOT STANDARD**– Varying from what is expected or published. For use in NOTAMs only.

**NOT STD**–

(See NOT STANDARD.)

**NOTAM**–

(See NOTICE TO AIRMEN.)

**NOTAM [ICAO]**– A notice 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.

**a. I Distribution**– Distribution by means of telecommunication.

**b. II Distribution**– Distribution by means other than telecommunications.

**NOTICE TO AIRMEN (NOTAM)**– A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely

knowledge of which is essential to personnel concerned with flight operations.

**NOTAM(D)**– A NOTAM given (in addition to local dissemination) distant dissemination beyond the area of responsibility of the Flight Service Station. These NOTAMs will be stored and available until canceled.

**c. FDC NOTAM**– A NOTAM regulatory in nature, transmitted by USNOF and given system wide dissemination.

(See ICAO term NOTAM.)

**NOTICES TO AIRMEN PUBLICATION**– A publication issued every 28 days, designed primarily for the pilot, which contains NOTAMs, graphic notices, and other information considered essential to the safety of flight as well as supplemental data to other aeronautical publications. The contraction NTAP is used in NOTAM text.

(See NOTICE TO AIRMEN.)

**NRR**–

(See NON-RESTRICTIVE ROUTING.)

**NRS**–

(See NAVIGATION REFERENCE SYSTEM.)

**NTAP**–

(See NOTICES TO AIRMEN PUBLICATION.)

**NUMEROUS TARGETS VICINITY (LOCATION)**– A traffic advisory issued by ATC to advise pilots that targets on the radar scope are too numerous to issue individually.

(See TRAFFIC ADVISORIES.)

**OFF-ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)**– An off-route altitude which provides obstruction clearance with a 1,000 foot buffer in non-mountainous terrain areas and a 2,000 foot buffer in designated mountainous areas within the United States. This altitude may not provide signal coverage from ground-based navigational aids, air traffic control radar, or communications coverage.

**OTR**–

(See OCEANIC TRANSITION ROUTE.)

**OTS**–

(See ORGANIZED TRACK SYSTEM.)

**OUT**– The conversation is ended and no response is expected.

**OUT OF SERVICE/UNSERVICEABLE (U/S)**–

When a piece of equipment, a NAVAID, a facility or a service is not operational, certified (if required) and immediately “available” for Air Traffic or public use.

**OUTER AREA** (associated with Class C airspace)– Non-regulatory airspace surrounding designated Class C airspace airports wherein ATC provides radar vectoring and sequencing on a full-time basis for all IFR and participating VFR aircraft. The service provided in the outer area is called Class C service which includes: IFR/IFR–IFR separation; IFR/VFR–traffic advisories and conflict resolution; and VFR/VFR–traffic advisories and, as appropriate, safety alerts. The normal radius will be 20 nautical miles with some variations based on site-specific requirements. The outer area extends outward from the primary Class C airspace airport and extends from the lower limits of radar/radio coverage up to the ceiling of the approach control’s delegated airspace excluding the Class C charted area and other airspace as appropriate.

(See CONFLICT RESOLUTION.)

(See CONTROLLED AIRSPACE.)

**OUTER COMPASS LOCATOR**–

(See COMPASS LOCATOR.)

**OUTER FIX**– A general term used within ATC to describe fixes in the terminal area, other than the final approach fix. Aircraft are normally cleared to these fixes by an Air Route Traffic Control Center or an Approach Control Facility. Aircraft are normally cleared from these fixes to the final approach fix or final approach course.

**OR**

**OUTER FIX**– An adapted fix along the converted route of flight, prior to the meter fix, for which crossing times are calculated and displayed in the metering position list.

**OUTER FIX ARC**– A semicircle, usually about a 50–70 mile radius from a meter fix, usually in high altitude, which is used by CTAS/ERAM to calculate outer fix times and determine appropriate sector meter list assignments for aircraft on an established arrival route that will traverse the arc.

**OUTER FIX TIME**– A calculated time to depart the outer fix in order to cross the vertex at the ACLT. The time reflects descent speed adjustments and any applicable delay time that must be absorbed prior to crossing the meter fix.

**OUTER MARKER**– 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 centerline of the runway.

(See INSTRUMENT LANDING SYSTEM.)

(See MARKER BEACON.)

(Refer to AIM.)

**OVER**– My transmission is ended; I expect a response.

**OVERHEAD MANEUVER**– 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 canceled 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.

**OVERLYING CENTER**– The ARTCC facility that is responsible for arrival/departure operations at a specific terminal.

# P

**P TIME–**

(See PROPOSED DEPARTURE TIME.)

**P-ACP–**

(See PREARRANGED COORDINATION PROCEDURES.)

**PAN-PAN–** The international radio-telephony urgency signal. When repeated three times, indicates uncertainty or alert followed by the nature of the urgency.

(See MAYDAY.)

(Refer to AIM.)

**PAR–**

(See PRECISION APPROACH RADAR.)

**PAR [ICAO]–**

(See ICAO Term PRECISION APPROACH RADAR.)

**PARALLEL ILS APPROACHES–** Approaches to parallel runways by IFR aircraft which, when established inbound toward the airport on the adjacent final approach courses, are radar-separated by at least 2 miles.

(See FINAL APPROACH COURSE.)

(See SIMULTANEOUS ILS APPROACHES.)

**PARALLEL OFFSET ROUTE–** A parallel track to the left or right of the designated or established airway/route. Normally associated with Area Navigation (RNAV) operations.

(See AREA NAVIGATION.)

**PARALLEL RUNWAYS–** Two or more runways at the same airport whose centerlines are parallel. In addition to runway number, parallel runways are designated as L (left) and R (right) or, if three parallel runways exist, L (left), C (center), and R (right).

**PBCT–**

(See PROPOSED BOUNDARY CROSSING TIME.)

**PBN–**

(See ICAO Term PERFORMANCE-BASED NAVIGATION.)

**PDC–**

(See PRE-DEPARTURE CLEARANCE.)

**PERFORMANCE-BASED NAVIGATION (PBN) [ICAO]–** 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.

**PERMANENT ECHO–** Radar signals reflected from fixed objects on the earth's surface; e.g., buildings, towers, terrain. Permanent echoes are distinguished from "ground clutter" by being definable locations rather than large areas. Under certain conditions they may be used to check radar alignment.

**PHOTO RECONNAISSANCE–** Military activity that requires locating individual photo targets and navigating to the targets at a preplanned angle and altitude. The activity normally requires a lateral route width of 16 NM and altitude range of 1,500 feet to 10,000 feet AGL.

**PILOT BRIEFING–** A service provided by the FSS to assist pilots in flight planning. Briefing items may include weather information, NOTAMS, military activities, flow control information, and other items as requested.

(Refer to AIM.)

**PILOT IN COMMAND–** The pilot responsible for the operation and safety of an aircraft during flight time.

(Refer to 14 CFR Part 91.)

**PILOT WEATHER REPORT–** A report of meteorological phenomena encountered by aircraft in flight.

(Refer to AIM.)

**PILOT'S DISCRETION–** When used in conjunction with altitude assignments, means that ATC has offered the pilot the option of starting climb or descent whenever he/she wishes and conducting the climb or descent at any rate he/she wishes. He/she may temporarily level off at any intermediate altitude. However, once he/she has vacated an altitude, he/she may not return to that altitude.

**PIREP–**

(See PILOT WEATHER REPORT.)

**PITCH POINT–** A fix/waypoint that serves as a transition point from a departure procedure or the low altitude ground-based navigation structure into the high altitude waypoint system.

**PLANS DISPLAY–** A display available in EDST that provides detailed flight plan and predicted conflict information in textual format for requested Current Plans and all Trial Plans.

(See EN ROUTE DECISION SUPPORT TOOL)

**POFZ–**

(See PRECISION OBSTACLE FREE ZONE.)

**POINT OUT–**

(See RADAR POINT OUT.)

**POINT-TO-POINT (PTP)–** A level of NRR service for aircraft that is based on traditional waypoints in their FMSs or RNAV equipage.

**POLAR TRACK STRUCTURE–** A system of organized routes between Iceland and Alaska which overlie Canadian MNPS Airspace.

**POSITION REPORT–** A report over a known location as transmitted by an aircraft to ATC.

(Refer to AIM.)

**POSITION SYMBOL–** A computer-generated indication shown on a radar display to indicate the mode of tracking.

**POSITIVE CONTROL–** The separation of all air traffic within designated airspace by air traffic control.

**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–** A standardized procedure which permits an air traffic controller to enter the airspace assigned to another air traffic controller without verbal coordination. The procedures are defined in a facility directive which ensures approved separation between aircraft.

**PREARRANGED COORDINATION PROCEDURES–** A facility'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 approved 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.

**PRECIPITATION RADAR WEATHER DESCRIPTIONS–** Existing radar systems cannot detect turbulence. However, there is a direct correlation between the degree of turbulence and other weather features associated with thunderstorms and the weather radar precipitation intensity. Controllers will issue (where capable) precipitation intensity as observed by radar when using weather and radar processor (WARP) or NAS ground-based digital radars with weather capabilities. When precipitation intensity information is not available, the intensity will be described as UNKNOWN. When intensity levels can be determined, they shall be described as:

- a. LIGHT (< 26 dBZ)
- b. MODERATE (26 to 40 dBZ)
- c. HEAVY (> 40 to 50 dBZ)
- d. EXTREME (> 50 dBZ)

(Refer to AC 00-45, Aviation Weather Services.)

**PRECISION APPROACH–**

(See PRECISION APPROACH PROCEDURE.)

**PRECISION APPROACH PROCEDURE–** A standard instrument approach procedure in which an electronic glideslope or other type of glidepath is provided; e.g., ILS, PAR, and GLS.

(See INSTRUMENT LANDING SYSTEM.)

(See PRECISION APPROACH RADAR.)

**PRECISION APPROACH RADAR–** Radar equipment in some ATC facilities operated by the FAA and/or the military services at joint-use civil/military locations and separate military installations to detect and display azimuth, elevation, and range of aircraft on the final approach course to a runway. This equipment may be used to monitor certain non-radar approaches, but is primarily used to conduct a precision instrument approach (PAR) wherein the controller issues guidance instructions to the pilot based on the aircraft's position in relation to the final approach course (azimuth), the glidepath (elevation),

and the distance (range) from the touchdown point on the runway as displayed on the radar scope.

Note: The abbreviation "PAR" is also used to denote preferential arrival routes in ARTCC computers.

(See GLIDEPATH.)

(See PAR.)

(See PREFERENTIAL ROUTES.)

(See ICAO term PRECISION APPROACH RADAR.)

(Refer to AIM.)

**PRECISION APPROACH RADAR [ICAO]**– 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 designed to enable pilots of aircraft to be given guidance by radio communication during the final stages of the approach to land.

**PRECISION OBSTACLE FREE ZONE (POFZ)**– An 800 foot wide by 200 foot long area centered on the runway centerline adjacent to the threshold designed to protect aircraft flying precision approaches from ground vehicles and other aircraft when ceiling is less than 250 feet or visibility is less than 3/4 statute mile (or runway visual range below 4,000 feet.)

**PRECISION RUNWAY MONITOR (PRM) SYSTEM**– Provides air traffic controllers monitoring the NTZ during simultaneous close parallel PRM approaches with precision, high update rate secondary surveillance data. The high update rate surveillance sensor component of the PRM system is only required for specific runway or approach course separation. The high resolution color monitoring display, Final Monitor Aid (FMA) of the PRM system, or other FMA with the same capability, presents NTZ surveillance track data to controllers along with detailed maps depicting approaches and no transgression zone and is required for all simultaneous close parallel PRM NTZ monitoring operations.

(Refer to AIM)

**PREDICTIVE WIND SHEAR ALERT SYSTEM (PWS)**– A self-contained system used on board some aircraft to alert the flight crew to the presence of a potential wind shear. PWS systems typically monitor 3 miles ahead and 25 degrees left and right of the

aircraft's heading at or below 1200' AGL. Departing flights may receive a wind shear alert after they start the takeoff roll and may elect to abort the takeoff. Aircraft on approach receiving an alert may elect to go around or perform a wind shear escape maneuver.

**PREFERENTIAL ROUTES**– Preferential routes (PDRs, PARs, and PDARs) are adapted in ARTCC computers to accomplish inter/intrafacility controller coordination and to assure that flight data is posted at the proper control positions. Locations having a need for these specific inbound and outbound routes normally publish such routes in local facility bulletins, and their use by pilots minimizes flight plan route amendments. When the workload or traffic situation permits, controllers normally provide radar vectors or assign requested routes to minimize circuitous routing. Preferential routes are usually confined to one ARTCC's area and are referred to by the following names or acronyms:

**a. Preferential Departure Route (PDR).** A specific departure route from an airport or terminal area to an en route point where there is no further need for flow control. It may be included in an Instrument Departure Procedure (DP) or a Preferred IFR Route.

**b. Preferential Arrival Route (PAR).** A specific arrival route from an appropriate en route point to an airport or terminal area. It may be included in a Standard Terminal Arrival (STAR) or a Preferred IFR Route. The abbreviation "PAR" is used primarily within the ARTCC and should not be confused with the abbreviation for Precision Approach Radar.

**c. Preferential Departure and Arrival Route (PDAR).** A route between two terminals which are within or immediately adjacent to one ARTCC's area. PDARs are not synonymous with Preferred IFR Routes but may be listed as such as they do accomplish essentially the same purpose.

(See PREFERRED IFR ROUTES.)

**PREFERRED IFR ROUTES**– Routes established between busier airports to increase system efficiency and capacity. They normally extend through one or more ARTCC areas and are designed to achieve balanced traffic flows among high density terminals. IFR clearances are issued on the basis of these routes except when severe weather avoidance procedures or other factors dictate otherwise. Preferred IFR Routes are listed in the Chart Supplement U.S. If a flight is planned to or from an area having such routes but the departure or arrival point is not listed in the Chart Supplement U.S., pilots may use that part of a

Preferred IFR Route which is appropriate for the departure or arrival point that is listed. Preferred IFR Routes are correlated with DPs and STARs and may be defined by airways, jet routes, direct routes between NAVAIDs, Waypoints, NAVAID radials/DME, or any combinations thereof.

(See CENTER'S AREA.)

(See INSTRUMENT DEPARTURE PROCEDURE.)

(See PREFERENTIAL ROUTES.)

(See STANDARD TERMINAL ARRIVAL.)

(Refer to CHART SUPPLEMENT U.S.)

(Refer to NOTICES TO AIRMEN PUBLICATION.)

PRE-FLIGHT PILOT BRIEFING–

(See PILOT BRIEFING.)

PREVAILING VISIBILITY–

(See VISIBILITY.)

PRIMARY RADAR TARGET– An analog or digital target, exclusive of a secondary radar target, presented on a radar display.

PRM–

(See AREA NAVIGATION (RNAV) GLOBAL POSITIONING SYSTEM (GPS) PRECISION RUNWAY MONITORING (PRM) APPROACH.)

(See PRM APPROACH.)

(See PRECISION RUNWAY MONITOR SYSTEM.)

PRM APPROACH– An instrument approach procedure titled ILS PRM, RNAV PRM, LDA PRM, or GLS PRM conducted to parallel runways separated by less than 4,300 feet and at least 3,000 feet where independent closely spaced approaches are permitted. Use of an enhanced display with alerting, a No Transgression Zone (NTZ), secondary monitor frequency, pilot PRM training, and publication of an Attention All Users Page are required for all PRM approaches. Depending on the runway spacing, the approach courses may be parallel or one approach course must be offset. PRM procedures are also used to conduct Simultaneous Offset Instrument Approach (SOIA) operations. In SOIA, one straight-in ILS PRM, RNAV PRM, GLS PRM, and one offset LDA PRM, RNAV PRM or GLS PRM approach are utilized. PRM procedures are terminated and a visual segment begins at the offset approach missed approach point where the minimum distance between the approach courses is

3000 feet. Runway spacing can be as close as 750 feet.

(Refer to AIM.)

PROCEDURAL CONTROL [ICAO]– Term used to indicate that information derived from an ATS surveillance system is not required for the provision of air traffic control service.

PROCEDURAL SEPARATION [ICAO]– The separation used when providing procedural control.

PROCEDURE TURN– The maneuver prescribed when it is necessary to reverse direction to establish an aircraft on the intermediate approach segment or final approach course. The outbound course, direction of turn, distance within which the turn must be completed, and minimum altitude are specified in the procedure. However, unless otherwise restricted, the point at which the turn may be commenced and the type and rate of turn are left to the discretion of the pilot.

(See ICAO term PROCEDURE TURN.)

PROCEDURE TURN [ICAO]– 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.

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

PROCEDURE TURN INBOUND– That point of a procedure turn maneuver where course reversal has been completed and an aircraft is established inbound on the intermediate approach segment or final approach course. A report of “procedure turn inbound” is normally used by ATC as a position report for separation purposes.

(See FINAL APPROACH COURSE.)

(See PROCEDURE TURN.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

PROFILE DESCENT– An uninterrupted descent (except where level flight is required for speed adjustment; e.g., 250 knots at 10,000 feet MSL) from cruising altitude/level to interception of a glideslope or to a minimum altitude specified for the initial or intermediate approach segment of a nonprecision instrument approach. The profile descent normally

terminates at the approach gate or where the glideslope or other appropriate minimum altitude is intercepted.

**PROGRESS REPORT–**

(See POSITION REPORT.)

**PROGRESSIVE TAXI–** Precise taxi instructions given to a pilot unfamiliar with the airport or issued in stages as the aircraft proceeds along the taxi route.

**PROHIBITED AREA–**

(See SPECIAL USE AIRSPACE.)

(See ICAO term PROHIBITED AREA.)

**PROHIBITED AREA [ICAO]–** An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

**PROMINENT OBSTACLE–** An obstacle that meets one or more of the following conditions:

**a.** An obstacle which stands out beyond the adjacent surface of surrounding terrain and immediately projects a noticeable hazard to aircraft in flight.

**b.** An obstacle, not characterized as low and close in, whose height is no less than 300 feet above the departure end of takeoff runway (DER) elevation, is within 10NM from the DER, and that penetrates that airport/heliport's diverse departure obstacle clearance surface (OCS).

**c.** An obstacle beyond 10NM from an airport/heliport that requires an obstacle departure procedure (ODP) to ensure obstacle avoidance.

(See OBSTACLE.)

(See OBSTRUCTION.)

**PROPELLER (PROP) WASH (PROP BLAST)–** The disturbed mass of air generated by the motion of a propeller.

**PROPOSED BOUNDARY CROSSING TIME–** Each center has a PBCT parameter for each internal airport. Proposed internal flight plans are transmitted

to the adjacent center if the flight time along the proposed route from the departure airport to the center boundary is less than or equal to the value of PBCT or if airport adaptation specifies transmission regardless of PBCT.

**PROPOSED DEPARTURE TIME–** The time that the aircraft expects to become airborne.

**PROTECTED AIRSPACE–** The airspace on either side of an oceanic route/track that is equal to one-half the lateral separation minimum except where reduction of protected airspace has been authorized.

**PROTECTED SEGMENT–** The protected segment is a segment on the amended TFM route that is to be inhibited from automatic adapted route alteration by ERAM.

**PT–**

(See PROCEDURE TURN.)

**PTP–**

(See POINT-TO-POINT.)

**PTS–**

(See POLAR TRACK STRUCTURE.)

**PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT–** A segment on an IAP chart annotated as "Fly Visual to Airport" or "Fly Visual." A dashed arrow will indicate the visual flight path on the profile and plan view with an associated note on the approximate heading and distance. The visual segment should be flown as a dead reckoning course while maintaining visual conditions.

**PUBLISHED ROUTE–** A route for which an IFR altitude has been established and published; e.g., Federal Airways, Jet Routes, Area Navigation Routes, Specified Direct Routes.

**PWS–**

(See PREDICTIVE WIND SHEAR ALERT SYSTEM.)



# R

**RADAR**– A device that provides information on range, azimuth, and/or elevation of objects by measuring the time interval between transmission and reception of directional radio pulses and correlating the angular orientation of the radiated antenna beam or beams in azimuth and/or elevation.

**a. Primary Radar**– A radar system in which a minute portion of a radio pulse transmitted from a site is reflected by an object and then received back at that site for processing and display at an air traffic control facility.

**b. Secondary Radar/Radar Beacon (ATCRBS)**– A radar system in which the object to be detected is fitted with cooperative equipment in the form of a radio receiver/transmitter (transponder). Radar pulses transmitted from the searching transmitter/receiver (interrogator) site are received in the cooperative equipment and used to trigger a distinctive transmission from the transponder. This reply transmission, rather than a reflected signal, is then received back at the transmitter/receiver site for processing and display at an air traffic control facility.

(See COOPERATIVE SURVEILLANCE.)

(See INTERROGATOR.)

(See NON-COOPERATIVE SURVEILLANCE.)

(See TRANSPONDER.)

(See ICAO term RADAR.)

(Refer to AIM.)

**RADAR [ICAO]**– A radio detection device which provides information on range, azimuth and/or elevation of objects.

**a. Primary Radar**– Radar system which uses reflected radio signals.

**b. Secondary Radar**– Radar system wherein a radio signal transmitted from a radar station initiates the transmission of a radio signal from another station.

**RADAR ADVISORY**– The provision of advice and information based on radar observations.

(See ADVISORY SERVICE.)

**RADAR ALTIMETER**–

(See RADIO ALTIMETER.)

**RADAR APPROACH**– An instrument approach procedure which utilizes Precision Approach Radar (PAR) or Airport Surveillance Radar (ASR).

(See AIRPORT SURVEILLANCE RADAR.)

(See INSTRUMENT APPROACH PROCEDURE.)

(See PRECISION APPROACH RADAR.)

(See SURVEILLANCE APPROACH.)

(See ICAO term RADAR APPROACH.)

(Refer to AIM.)

**RADAR APPROACH [ICAO]**– An approach, executed by an aircraft, under the direction of a radar controller.

**RADAR APPROACH CONTROL FACILITY**– A terminal ATC facility that uses radar and nonradar capabilities to provide approach control services to aircraft arriving, departing, or transiting airspace controlled by the facility.

(See APPROACH CONTROL SERVICE.)

**a. Provides radar ATC services to aircraft operating in the vicinity of one or more civil and/or military airports in a terminal area.** The facility may provide services of a ground controlled approach (GCA); i.e., ASR and PAR approaches. A radar approach control facility may be operated by FAA, USAF, US Army, USN, USMC, or jointly by FAA and a military service. Specific facility nomenclatures are used for administrative purposes only and are related to the physical location of the facility and the operating service generally as follows:

**1. Army Radar Approach Control (ARAC)** (US Army).

**2. Radar Air Traffic Control Facility (RATCF)** (USN/FAA and USMC/FAA).

**3. Radar Approach Control (RAPCON)** (USAF/FAA, USN/FAA, and USMC/FAA).

**4. Terminal Radar Approach Control (TRACON)** (FAA).

**5. Air Traffic Control Tower (ATCT)** (FAA). (Only those towers delegated approach control authority.)

**RADAR ARRIVAL**– An aircraft arriving at an airport served by a radar facility and in radar contact with the facility.

(See NONRADAR.)

**RADAR BEACON–**

(See RADAR.)

**RADAR CLUTTER [ICAO]–** The visual indication on a radar display of unwanted signals.

***RADAR CONTACT–***

**a.** Used by ATC to inform an aircraft that it is identified using an approved ATC surveillance source on an air traffic controller's display and that radar flight following will be provided until radar service is terminated. Radar service may also be provided within the limits of necessity and capability. When a pilot is informed of "radar contact," he/she automatically discontinues reporting over compulsory reporting points.

(See ATC SURVEILLANCE SOURCE.)

(See RADAR CONTACT LOST.)

(See RADAR FLIGHT FOLLOWING.)

(See RADAR SERVICE.)

(See RADAR SERVICE TERMINATED.)

(Refer to AIM.)

**b.** The term used to inform the controller that the aircraft is identified and approval is granted for the aircraft to enter the receiving controllers airspace.

(See ICAO term RADAR CONTACT.)

**RADAR CONTACT [ICAO]–** The situation which exists when the radar blip or radar position symbol of a particular aircraft is seen and identified on a radar display.

***RADAR CONTACT LOST–*** Used by ATC to inform a pilot that the surveillance 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's equipment, or failure of the surveillance equipment.

(See CLUTTER.)

(See RADAR CONTACT.)

**RADAR ENVIRONMENT–** An area in which radar service may be provided.

(See ADDITIONAL SERVICES.)

(See RADAR CONTACT.)

(See RADAR SERVICE.)

(See TRAFFIC ADVISORIES.)

**RADAR FLIGHT FOLLOWING–** The observation of the progress of radar-identified aircraft, whose primary navigation is being provided by the pilot, wherein the controller retains and correlates the aircraft identity with the appropriate target or target symbol displayed on the radar scope.

(See RADAR CONTACT.)

(See RADAR SERVICE.)

(Refer to AIM.)

**RADAR IDENTIFICATION–** The process of ascertaining that an observed radar target is the radar return from a particular aircraft.

(See RADAR CONTACT.)

(See RADAR SERVICE.)

**RADAR IDENTIFIED AIRCRAFT–** An aircraft, the position of which has been correlated with an observed target or symbol on the radar display.

(See RADAR CONTACT.)

(See RADAR CONTACT LOST.)

**RADAR MONITORING–**

(See RADAR SERVICE.)

**RADAR NAVIGATIONAL GUIDANCE–**

(See RADAR SERVICE.)

**RADAR 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.

**RADAR REQUIRED–** A term displayed on charts and approach plates and included in FDC NOTAMS to alert pilots that segments of either an instrument approach procedure or a route are not navigable because of either the absence or unusability of a NAVAID. The pilot can expect to be provided radar navigational guidance while transiting segments labeled with this term.

(See RADAR ROUTE.)

(See RADAR SERVICE.)

**RADAR ROUTE–** A flight path or route over which an aircraft is vectored. Navigational guidance and altitude assignments are provided by ATC.

(See FLIGHT PATH.)

(See ROUTE.)

**RADAR SEPARATION–**

(See RADAR SERVICE.)

**RADAR SERVICE–** A term which encompasses one or more of the following services based on the use of

radar which can be provided by a controller to a pilot of a radar identified aircraft.

**a. Radar Monitoring**– The radar flight-following of aircraft, whose primary navigation is being performed by the pilot, to observe and note deviations from its authorized flight path, airway, or route. When being applied specifically to radar monitoring of instrument approaches; i.e., with precision approach radar (PAR) or radar monitoring of simultaneous ILS, RNAV and GLS approaches, it includes advice and instructions whenever an aircraft nears or exceeds the prescribed PAR safety limit or simultaneous ILS RNAV and GLS no transgression zone.

(See ADDITIONAL SERVICES.)

(See TRAFFIC ADVISORIES.)

**b. Radar Navigational Guidance**– Vectoring aircraft to provide course guidance.

**c. Radar Separation**– Radar spacing of aircraft in accordance with established minima.

(See ICAO term RADAR SERVICE.)

**RADAR SERVICE [ICAO]**– Term used to indicate a service provided directly by means of radar.

**a. Monitoring**– The use of radar for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path.

**b. Separation**– The separation used when aircraft position information is derived from radar sources.

***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 service is automatically terminated, and the pilot is not advised in the following cases:

**a.** An aircraft cancels its IFR flight plan, except within Class B airspace, Class C airspace, a TRSA, or where Basic Radar service is provided.

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

**c.** An arriving VFR aircraft, receiving radar service to a tower-controlled airport within Class B airspace, Class C airspace, a TRSA, or where sequencing service is provided, has landed; or to all other airports, is instructed to change to tower or advisory frequency.

**d.** An aircraft completes a radar approach.

**RADAR SURVEILLANCE**– The radar observation of a given geographical area for the purpose of performing some radar function.

**RADAR TRAFFIC ADVISORIES**– Advisories issued to alert pilots to known or observed radar traffic which may affect the intended route of flight of their aircraft.

(See TRAFFIC ADVISORIES.)

**RADAR TRAFFIC INFORMATION SERVICE**–

(See TRAFFIC ADVISORIES.)

**RADAR VECTORING [ICAO]**– Provision of navigational guidance to aircraft in the form of specific headings, based on the use of radar.

**RADIAL**– A magnetic bearing extending from a VOR/VORTAC/TACAN navigation facility.

**RADIO**–

**a.** A device used for communication.

**b.** Used to refer to a flight service station; e.g., “Seattle Radio” is used to call Seattle FSS.

**RADIO ALTIMETER**– Aircraft equipment which makes use of the reflection of radio waves from the ground to determine the height of the aircraft above the surface.

**RADIO BEACON**–

(See NONDIRECTIONAL BEACON.)

**RADIO DETECTION AND RANGING**–

(See RADAR.)

**RADIO MAGNETIC INDICATOR**– An aircraft navigational instrument coupled with a gyro compass or similar compass that indicates the direction of a selected NAVAID and indicates bearing with respect to the heading of the aircraft.

**RAIS**–

(See REMOTE AIRPORT INFORMATION SERVICE.)

**RAMP**–

(See APRON.)

**RANDOM ALTITUDE**– An altitude inappropriate for direction of flight and/or not in accordance with FAA Order JO 7110.65, Paragraph 4–5–1, VERTICAL SEPARATION MINIMA.

**RANDOM ROUTE**– Any route not established or charted/published or not otherwise available to all users.

**RC**–

(See ROAD RECONNAISSANCE.)

**RCAG–**

(See REMOTE COMMUNICATIONS AIR/GROUND FACILITY.)

**RCC–**

(See RESCUE COORDINATION CENTER.)

**RCO–**

(See REMOTE COMMUNICATIONS OUTLET.)

**RCR–**

(See RUNWAY CONDITION READING.)

**READ BACK–** Repeat my message back to me.

**RECEIVER AUTONOMOUS INTEGRITY MONITORING (RAIM)–** A technique whereby a civil GNSS receiver/processor determines the integrity of the GNSS navigation signals without reference to sensors or non-DoD integrity systems other than the receiver itself. This determination is achieved by a consistency check among redundant pseudorange measurements.

**RECEIVING CONTROLLER–** A controller/facility receiving control of an aircraft from another controller/facility.

**RECEIVING FACILITY–**

(See RECEIVING CONTROLLER.)

**RECONFORMANCE–** The automated process of bringing an aircraft's Current Plan Trajectory into conformance with its track.

**REDUCE SPEED TO (SPEED)–**

(See SPEED ADJUSTMENT.)

**REFINED HAZARD AREA (RHA)–** Used by ATC. Airspace that is defined and distributed after a failure of a launch or reentry operation to provide a more concise depiction of the hazard location than a Contingency Hazard Area.

(See AIRCRAFT HAZARD AREA.)

(See CONTINGENCY HAZARD AREA.)

(See TRANSITIONAL HAZARD AREA.)

**REIL–**

(See RUNWAY END IDENTIFIER LIGHTS.)

**RELEASE TIME–** A departure time restriction issued to a pilot by ATC (either directly or through an authorized relay) when necessary to separate a departing aircraft from other traffic.

(See ICAO term RELEASE TIME.)

**RELEASE TIME [ICAO]–** Time prior to which an aircraft should be given further clearance or prior to which it should not proceed in case of radio failure.

**REMOTE AIRPORT INFORMATION SERVICE (RAIS)–** A temporary service provided by facilities, which are not located on the landing airport, but have communication capability and automated weather reporting available to the pilot at the landing airport.

**REMOTE COMMUNICATIONS AIR/GROUND FACILITY–** An unmanned VHF/UHF transmitter/receiver facility which is used to expand ARTCC air/ground communications coverage and to facilitate direct contact between pilots and controllers. RCAG facilities are sometimes not equipped with emergency frequencies 121.5 MHz and 243.0 MHz.

(Refer to AIM.)

**REMOTE COMMUNICATIONS OUTLET (RCO)–** An unmanned communications facility remotely controlled by air traffic personnel. RCOs serve FSSs. Remote Transmitter/Receivers (RTR) serve terminal ATC facilities. An RCO or RTR may be UHF or VHF and will extend the communication range of the air traffic facility. There are several classes of RCOs and RTRs. The class is determined by the number of transmitters or receivers. Classes A through G are used primarily for air/ground purposes. RCO and RTR class O facilities are nonprotected outlets subject to undetected and prolonged outages. RCO (O's) and RTR (O's) were established for the express purpose of providing ground-to-ground communications between air traffic control specialists and pilots located at a satellite airport for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times. As a secondary function, they may be used for advisory purposes whenever the aircraft is below the coverage of the primary air/ground frequency.

**REMOTE TRANSMITTER/RECEIVER (RTR)–**

(See REMOTE COMMUNICATIONS OUTLET.)

**REPORT–** Used to instruct pilots to advise ATC of specified information; e.g., "Report passing Hamilton VOR."

**REPORTING POINT–** A geographical location in relation to which the position of an aircraft is reported.

(See COMPULSORY REPORTING POINTS.)

(See ICAO term REPORTING POINT.)

(Refer to AIM.)

**REPORTING POINT [ICAO]**– A specified geographical location in relation to which the position of an aircraft can be reported.

**REQUEST FULL ROUTE CLEARANCE**– Used by pilots to request that the entire route of flight be read verbatim in an ATC clearance. Such request should be made to preclude receiving an ATC clearance based on the original filed flight plan when a filed IFR flight plan has been revised by the pilot, company, or operations prior to departure.

**REQUIRED NAVIGATION PERFORMANCE (RNP)**– A statement of the navigational performance necessary for operation within a defined airspace. The following terms are commonly associated with RNP:

**a. Required Navigation Performance Level or Type (RNP-X).** A value, in nautical miles (NM), from the intended horizontal position within which an aircraft would be at least 95-percent of the total flying time.

**b. Advanced – Required Navigation Performance (A-RNP).** A navigation specification based on RNP that requires advanced functions such as scalable RNP, radius-to-fix (RF) legs, and tactical parallel offsets. This sophisticated Navigation Specification (NavSpec) is designated by the abbreviation “A-RNP”.

**c. Required Navigation Performance (RNP) Airspace.** A generic term designating airspace, route(s), leg(s), operation(s), or procedure(s) where minimum required navigational performance (RNP) have been established.

**d. Actual Navigation Performance (ANP).** A measure of the current estimated navigational performance. Also referred to as Estimated Position Error (EPE).

**e. Estimated Position Error (EPE).** A measure of the current estimated navigational performance. Also referred to as Actual Navigation Performance (ANP).

**f. Lateral Navigation (LNAV).** A function of area navigation (RNAV) equipment which calculates, displays, and provides lateral guidance to a profile or path.

**g. Vertical Navigation (VNAV).** A function of area navigation (RNAV) equipment which calculates, displays, and provides vertical guidance to a profile or path.

**RESCUE COORDINATION CENTER (RCC)**– A search and rescue (SAR) facility equipped and manned to coordinate and control SAR operations in an area designated by the SAR plan. The U.S. Coast Guard and the U.S. Air Force have responsibility for the operation of RCCs.

(See ICAO term **RESCUE CO-ORDINATION CENTRE**.)

**RESCUE CO-ORDINATION CENTRE [ICAO]**– A unit responsible for promoting efficient organization of search and rescue service and for coordinating the conduct of search and rescue operations within a search and rescue region.

**RESOLUTION ADVISORY**– A display indication given to the pilot by the Traffic alert and Collision Avoidance System (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**–

(See **SPECIAL USE AIRSPACE**.)

(See ICAO term **RESTRICTED AREA**.)

**RESTRICTED AREA [ICAO]**– 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 NORMAL SPEED**– Used by ATC to advise a pilot to resume an aircraft’s normal operating speed. It is issued to terminate a speed adjustment where no published speed restrictions apply. It does not delete speed restrictions in published procedures of upcoming segments of flight. This does not relieve the pilot of those speed restrictions that are applicable to 14 CFR Section 91.117.

**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.

(See **RADAR CONTACT LOST**.)

(See **RADAR SERVICE TERMINATED**.)

**RESUME PUBLISHED SPEED**– Used by ATC to advise a pilot to resume published speed restrictions that are applicable to a SID, STAR, or other instrument procedure. It is issued to terminate a speed

adjustment where speed restrictions are published on a charted procedure.

**RHA**–

(See REFINED HAZARD AREA.)

**RMI**–

(See RADIO MAGNETIC INDICATOR.)

**RNAV**–

(See AREA NAVIGATION (RNAV).)

**RNAV APPROACH**– An instrument approach procedure which relies on aircraft area navigation equipment for navigational guidance.

(See AREA NAVIGATION (RNAV).)

(See INSTRUMENT APPROACH PROCEDURE.)

**ROAD RECONNAISSANCE (RC)**– Military activity requiring navigation along roads, railroads, and rivers. Reconnaissance route/route segments are seldom along a straight line and normally require a lateral route width of 10 NM to 30 NM and an altitude range of 500 feet to 10,000 feet AGL.

**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.

(See AFFIRMATIVE.)

(See NEGATIVE.)

**ROLLOUT RVR**–

(See VISIBILITY.)

**ROTOR WASH**– A phenomenon resulting from the vertical down wash of air generated by the main rotor(s) of a helicopter.

**ROUND-ROBIN FLIGHT PLAN**– A single flight plan filed from the departure airport to an intermediary destination(s) and then returning to the original departure airport.

**ROUTE**– A defined path, consisting of one or more courses in a horizontal plane, which aircraft traverse over the surface of the earth.

(See AIRWAY.)

(See JET ROUTE.)

(See PUBLISHED ROUTE.)

(See UNPUBLISHED ROUTE.)

**ROUTE ACTION NOTIFICATION**– EDST notification that a PAR/PDR/PDAR has been applied to the flight plan.

(See ATC PREFERRED ROUTE NOTIFICATION.)

(See EN ROUTE DECISION SUPPORT TOOL.)

**ROUTE SEGMENT**– 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.

(See FIX.)

(See ROUTE.)

(See ICAO term ROUTE SEGMENT.)

**ROUTE SEGMENT [ICAO]**– A portion of a route to be flown, as defined by two consecutive significant points specified in a flight plan.

**RSA**–

(See RUNWAY SAFETY AREA.)

**RTR**–

(See REMOTE TRANSMITTER/RECEIVER.)

**RUNWAY**– A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length. Runways are normally numbered in relation to their magnetic direction rounded off to the nearest 10 degrees; e.g., Runway 1, Runway 25.

(See PARALLEL RUNWAYS.)

(See ICAO term RUNWAY.)

**RUNWAY [ICAO]**– A defined rectangular area on a land aerodrome prepared for the landing and takeoff of aircraft.

**RUNWAY CENTERLINE LIGHTING**–

(See AIRPORT LIGHTING.)

**RUNWAY CONDITION CODES (RwyCC)**– Numerical readings, provided by airport operators, that indicate runway surface contamination (for example, slush, ice, rain, etc.). These values range from “1” (poor) to “6” (dry) and must be included on the ATIS when the reportable condition is less than 6 in any one or more of the three runway zones (touchdown, midpoint, rollout).

**RUNWAY CONDITION READING**– Numerical decelerometer readings relayed by air traffic controllers at USAF and certain civil bases for use by the pilot in determining runway braking action. These readings are routinely relayed only to USAF and Air National Guard Aircraft.

(See BRAKING ACTION.)

**RUNWAY CONDITION REPORT (RwyCR)**– A data collection worksheet used by airport operators that correlates the runway percentage of coverage along with the depth and type of contaminant for the purpose of creating a FICON NOTAM.

(See **RUNWAY CONDITION CODES**.)

**RUNWAY END IDENTIFIER LIGHTS (REIL)**–

(See **AIRPORT LIGHTING**.)

**RUNWAY ENTRANCE LIGHTS (REL)**–An array of red lights which include the first light at the hold line followed by a series of evenly spaced lights to the runway edge aligned with the taxiway centerline, and one additional light at the runway centerline in line with the last two lights before the runway edge.

**RUNWAY GRADIENT**– The average slope, measured in percent, between two ends or points on a runway. Runway gradient is depicted on Government aerodrome sketches when total runway gradient exceeds 0.3%.

***RUNWAY HEADING***– The magnetic direction that corresponds with the runway centerline 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 centerline of the departure runway. Drift correction shall not be applied; e.g., Runway 4, actual magnetic heading of the runway centerline 044, fly 044.

**RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY**– 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.

**RUNWAY LIGHTS**–

(See **AIRPORT LIGHTING**.)

**RUNWAY MARKINGS**–

(See **AIRPORT MARKING AIDS**.)

**RUNWAY OVERRUN**– In military aviation exclusively, a stabilized or paved area beyond the end of a runway, of the same width as the runway plus

shoulders, centered on the extended runway centerline.

**RUNWAY PROFILE DESCENT**– An instrument flight rules (IFR) air traffic control arrival procedure to a runway published for pilot use in graphic and/or textual form and may be associated with a STAR. Runway Profile Descents provide routing and may depict crossing altitudes, speed restrictions, and headings to be flown from the en route structure to the point where the pilot will receive clearance for and execute an instrument approach procedure. A Runway Profile Descent may apply to more than one runway if so stated on the chart.

(Refer to AIM.)

**RUNWAY SAFETY AREA**– A defined surface surrounding the runway prepared, or suitable, for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. The dimensions of the RSA vary and can be determined by using the criteria contained within AC 150/5300-13, Airport Design, Chapter 3. Figure 3–1 in AC 150/5300-13 depicts the RSA. The design standards dictate that the RSA shall be:

a. Cleared, graded, and have no potentially hazardous ruts, humps, depressions, or other surface variations;

b. Drained by grading or storm sewers to prevent water accumulation;

c. Capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and,

d. Free of objects, except for objects that need to be located in the runway safety area because of their function. These objects shall be constructed on low impact resistant supports (frangible mounted structures) to the lowest practical height with the frangible point no higher than 3 inches above grade.

(Refer to AC 150/5300-13, Airport Design, Chapter 3.)

**RUNWAY STATUS LIGHTS (RWSL) SYSTEM**– The RWSL is a system of runway and taxiway lighting to provide pilots increased situational awareness by illuminating runway entry lights (REL) when the runway is unsafe for entry or crossing, and take-off hold lights (THL) when the runway is unsafe for departure.

**RUNWAY TRANSITION–**

**a. Conventional STARs/SIDs.** The portion of a STAR/SID that serves a particular runway or runways at an airport.

**b. RNAV STARs/SIDs.** Defines a path(s) from the common route to the final point(s) on a STAR. For a SID, the common route that serves a particular runway or runways at an airport.

**RUNWAY USE PROGRAM–** A noise abatement runway selection plan designed to enhance noise abatement efforts with regard to airport communities for arriving and departing aircraft. These plans are developed into runway use programs and apply to all turbojet aircraft 12,500 pounds or heavier; turbojet aircraft less than 12,500 pounds are included only if the airport proprietor determines that the aircraft creates a noise problem. Runway use programs are coordinated with FAA offices, and safety criteria used in these programs are developed by the Office of Flight Operations. Runway use programs are

administered by the Air Traffic Service as “Formal” or “Informal” programs.

**a. Formal Runway Use Program–** An approved noise abatement program which is defined and acknowledged in a Letter of Understanding between Flight Operations, Air Traffic Service, the airport proprietor, and the users. Once established, participation in the program is mandatory for aircraft operators and pilots as provided for in 14 CFR Section 91.129.

**b. Informal Runway Use Program–** An approved noise abatement program which does not require a Letter of Understanding, and participation in the program is voluntary for aircraft operators/pilots.

**RUNWAY VISUAL RANGE (RVR)–**

(See VISIBILITY.)

**RwyCC–**

(See RUNWAY CONDITION CODES.)

**RwyCR–**

(See RUNWAY CONDITION REPORT.)

to the runway threshold, visual separation by the aircraft conducting the offset approach is utilized.

(Refer to AIM)

**SIMULTANEOUS (PARALLEL) DEPENDENT APPROACHES**– An approach operation permitting ILS/RNAV/GLS approaches to adjacent parallel runways where prescribed diagonal spacing must be maintained. Aircraft are not permitted to pass each other during simultaneous dependent operations. Integral parts of a total system ATC procedures, and appropriate airborne and ground based equipment.

**SINGLE DIRECTION ROUTES**– Preferred IFR Routes which are sometimes depicted on high altitude en route charts and which are normally flown in one direction only.

(See PREFERRED IFR ROUTES.)

(Refer to CHART SUPPLEMENT U.S.)

**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 facility. The abbreviation “SFA” in the DOD FLIP IFR Supplement under “Communications” indicates this service is available at an aerodrome.

**SINGLE-PILOTED AIRCRAFT**– A military turbojet aircraft possessing one set of flight controls, tandem cockpits, or two sets of flight controls but operated by one pilot is considered single-piloted by ATC when determining the appropriate air traffic service to be applied.

(See SINGLE FREQUENCY APPROACH.)

**SKYSPOTTER**– A pilot who has received specialized training in observing and reporting inflight weather phenomena.

**SLASH**– A radar beacon reply displayed as an elongated target.

**SLDI**–

(See SECTOR LIST DROP INTERVAL.)

**SLOT TIME**–

(See METER FIX TIME/SLOT TIME.)

**SLOW TAXI**– To taxi a float plane at low power or low RPM.

**SN**–

(See SYSTEM STRATEGIC NAVIGATION.)

**SPACE-BASED ADS-B (SBA)**– A constellation of satellites that receives ADS-B Out broadcasts and relays that information to the appropriate surveillance facility. The currently deployed SBA system is only capable of receiving broadcasts from 1090ES-equipped aircraft, and not from those equipped with only a universal access transceiver (UAT). Also, aircraft with a top-of-fuselage-mounted transponder antenna (required for TCAS II installations) will be better received by SBA, especially at latitudes below 45 degrees.

(See AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST.)

(See AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST OUT.)

**SPEAK SLOWER**– Used in verbal communications as a request to reduce speech rate.

**SPECIAL ACTIVITY AIRSPACE (SAA)**– Any airspace with defined dimensions within the National Airspace System wherein limitations may be imposed upon aircraft operations. This airspace may be restricted areas, prohibited areas, military operations areas, air ATC assigned airspace, and any other designated airspace areas. The dimensions of this airspace are programmed into EDST and can be designated as either active or inactive by screen entry. Aircraft trajectories are constantly tested against the dimensions of active areas and alerts issued to the applicable sectors when violations are predicted.

(See EN ROUTE DECISION SUPPORT TOOL.)

**SPECIAL AIR TRAFFIC RULES (SATR)**– Rules that govern procedures for conducting flights in certain areas listed in 14 CFR Part 93. The term “SATR” is used in the United States to describe the rules for operations in specific areas designated in the Code of Federal Regulations.

(Refer to 14 CFR Part 93.)

**SPECIAL EMERGENCY**– A condition of air piracy or other hostile act by a person(s) aboard an aircraft which threatens the safety of the aircraft or its passengers.

**SPECIAL FLIGHT RULES AREA (SFRA)**– An area in the NAS, described in 14 CFR Part 93, wherein the flight of aircraft is subject to special

traffic rules, unless otherwise authorized by air traffic control. Not all areas listed in 14 CFR Part 93 are designated SFRA, but special air traffic rules apply to all areas described in 14 CFR Part 93.

#### **SPECIAL INSTRUMENT APPROACH PROCEDURE–**

(See INSTRUMENT APPROACH PROCEDURE.)

**SPECIAL USE AIRSPACE–** Airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Types of special use airspace are:

**a. Alert Area–** Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft. Alert Areas are depicted on aeronautical charts for the information of nonparticipating pilots. All activities within an Alert Area are conducted in accordance with Federal Aviation Regulations, and pilots of participating aircraft as well as pilots transiting the area are equally responsible for collision avoidance.

**b. Controlled Firing Area–** Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons and property on the ground.

**c. Military Operations Area (MOA)–** Permanent and temporary MOAs are airspace established outside of Class A airspace area to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. Permanent MOAs are depicted on Sectional Aeronautical, VFR Terminal Area, and applicable En Route Low Altitude Charts.

Note: Temporary MOAs are not charted.

(Refer to AIM.)

**d. Prohibited Area–** Airspace designated under 14 CFR Part 73 within which no person may operate an aircraft without the permission of the using agency.

(Refer to AIM.)

(Refer to En Route Charts.)

**e. Restricted Area–** Permanent and temporary restricted areas are airspace designated under 14 CFR Part 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most

restricted areas are designated joint use and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency. Permanent restricted areas are depicted on Sectional Aeronautical, VFR Terminal Area, and applicable En Route charts. Where joint use is authorized, the name of the ATC controlling facility is also shown.

Note: Temporary restricted areas are not charted.

(Refer to 14 CFR Part 73.)

(Refer to AIM.)

**f. Warning Area–** A warning area is airspace of defined dimensions extending from 3 nautical miles outward from the coast of the United States, that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning area is to warn nonparticipating pilots of the potential danger. A warning area may be located over domestic or international waters or both.

**SPECIAL VFR CONDITIONS–** Meteorological conditions that are less than those required for basic VFR flight in Class B, C, D, or E surface areas and in which some aircraft are permitted flight under visual flight rules.

(See SPECIAL VFR OPERATIONS.)

(Refer to 14 CFR Part 91.)

**SPECIAL VFR FLIGHT [ICAO]–** A VFR flight cleared by air traffic control to operate within Class B, C, D, and E surface areas in metrological conditions below VMC.

**SPECIAL VFR OPERATIONS–** Aircraft operating in accordance with clearances within Class B, C, D, and E surface areas in weather conditions less than the basic VFR weather minima. Such operations must be requested by the pilot and approved by ATC.

(See SPECIAL VFR CONDITIONS.)

(See ICAO term SPECIAL VFR FLIGHT.)

#### **SPEED–**

(See AIRSPEED.)

(See GROUND SPEED.)

**SPEED ADJUSTMENT–** An ATC procedure used to request pilots to adjust aircraft speed to a specific value 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 the specified speed. Examples of speed adjustments are:

**a. “Increase/reduce speed to Mach point (number).”**

b. "Increase/reduce speed to (speed in knots)" or "Increase/reduce speed (number of knots) knots."

**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.

**SPOOFING**– Denotes emissions of GNSS-like signals that may be acquired and tracked in combination with or instead of the intended signals by civil receivers. The onset of spoofing effects can be instantaneous or delayed, and effects can persist after the spoofing has ended. Spoofing can result in false and potentially confusing, or hazardously misleading, position, navigation, and/or date/time information in addition to loss of GNSS use.

**SQUAWK (Mode, Code, Function)**– Used by ATC to instruct a pilot to activate the aircraft transponder and ADS-B Out with altitude reporting enabled, or (military) to activate only specific modes, codes, or functions. Examples: "Squawk five seven zero seven;" "Squawk three/alpha, two one zero five."

(See TRANSPONDER.)

**STA**–

(See SCHEDULED TIME OF ARRIVAL.)

**STAGING/QUEUING**– The placement, integration, and segregation of departure aircraft in designated movement areas of an airport by departure fix, EDCT, and/or restriction.

**STAND BY**– Means the controller or pilot must pause for a few seconds, usually to attend to other duties of a higher priority. Also means to wait as in "stand by for clearance." The caller should reestablish contact if a delay is lengthy. "Stand by" is not an approval or denial.

**STANDARD INSTRUMENT APPROACH PROCEDURE (SIAP)**–

(See INSTRUMENT APPROACH PROCEDURE.)

**STANDARD INSTRUMENT DEPARTURE (SID)**– A preplanned instrument flight rule (IFR) air traffic control (ATC) departure procedure printed for pilot/controller use in graphic form to provide

obstacle clearance and a transition from the terminal area to the appropriate en route structure. SIDs are primarily designed for system enhancement to expedite traffic flow and to reduce pilot/controller workload. ATC clearance must always be received prior to flying a SID.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See OBSTACLE DEPARTURE PROCEDURE.)

(Refer to AIM.)

**STANDARD RATE TURN**– A turn of three degrees per second.

**STANDARD TERMINAL ARRIVAL (STAR)**– A preplanned instrument flight rule (IFR) air traffic control arrival procedure published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

**STANDARD TERMINAL ARRIVAL CHARTS**–  
(See AERONAUTICAL CHART.)

**STANDARD TERMINAL AUTOMATION REPLACEMENT SYSTEM (STARS)**–

(See DTAS.)

**STAR**–

(See STANDARD TERMINAL ARRIVAL.)

**STATE AIRCRAFT**– Aircraft used in military, customs and police service, in the exclusive service of any government or of any political subdivision thereof, including the government of any state, territory, or possession of the United States or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

**STATIC RESTRICTIONS**– Those restrictions that are usually not subject to change, fixed, in place, and/or published.

**STATIONARY RESERVATIONS**– Altitude reservations which encompass activities in a fixed area. Stationary reservations may include activities, such as special tests of weapons systems or equipment, certain U.S. Navy carrier, fleet, and anti-submarine operations, rocket, missile and drone operations, and certain aerial refueling or similar operations.

**STEP TAXI**– To taxi a float plane at full power or high RPM.

**STEP TURN**– A maneuver used to put a float plane in a planing configuration prior to entering an active sea lane for takeoff. The STEP TURN maneuver should only be used upon pilot request.

**STEPDOWN FIX**– A fix permitting additional descent within a segment of an instrument approach procedure by identifying a point at which a controlling obstacle has been safely overflown.

**STEREO ROUTE**– A routinely used route of flight established by users and ARTCCs identified by a coded name; e.g., ALPHA 2. These routes minimize flight plan handling and communications.

**STOL AIRCRAFT**–

(See SHORT TAKEOFF AND LANDING AIRCRAFT.)

**STOP ALTITUDE SQUAWK**– Used by ATC to instruct a pilot to turn off the automatic altitude reporting feature of the aircraft transponder and ADS-B Out. It is issued when a verbally reported altitude varies by 300 feet or more from the automatic altitude report.

(See ALTITUDE READOUT.)

(See TRANSPONDER.)

**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.

(See LOW APPROACH.)

(See OPTION APPROACH.)

**STOP BURST**–

(See STOP STREAM.)

**STOP BUZZER**–

(See STOP STREAM.)

**STOP SQUAWK (Mode or Code)**– Used by ATC to instruct a pilot to stop transponder and ADS-B transmissions, or to turn off only specified functions of the aircraft transponder (military).

(See STOP ALTITUDE SQUAWK.)

(See TRANSPONDER.)

**STOP STREAM**– Used by ATC to request a pilot to suspend electronic attack activity.

(See JAMMING.)

**STOPOVER FLIGHT PLAN**– A flight plan format which permits in a single submission the filing of a sequence of flight plans through interim full-stop destinations to a final destination.

**STOPWAY**– An area beyond the takeoff runway no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff.

**STRAIGHT-IN APPROACH IFR**– 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.

(See LANDING MINIMUMS.)

(See STRAIGHT-IN APPROACH VFR.)

(See STRAIGHT-IN LANDING.)

**STRAIGHT-IN APPROACH VFR**– Entry into the traffic pattern by interception of the extended runway centerline (final approach course) without executing any other portion of the traffic pattern.

(See TRAFFIC PATTERN.)

**STRAIGHT-IN LANDING**– A landing made on a runway aligned within 30° of the final approach course following completion of an instrument approach.

(See STRAIGHT-IN APPROACH IFR.)

**STRAIGHT-IN LANDING MINIMUMS**–

(See LANDING MINIMUMS.)

**STRAIGHT-IN MINIMUMS**–

(See STRAIGHT-IN LANDING MINIMUMS.)

**STRATEGIC PLANNING**– Planning whereby solutions are sought to resolve potential conflicts.

**SUBSTITUTE ROUTE**– A route assigned to pilots when any part of an airway or route is unusable because of NAVAID status. These routes consist of:

a. Substitute routes which are shown on U.S. Government charts.

b. Routes defined by ATC as specific NAVAID radials or courses.

c. Routes defined by ATC as direct to or between NAVAIDs.

**SUNSET AND SUNRISE**– The mean solar times of sunset and sunrise as published in the Nautical Almanac, converted to local standard time for the locality concerned. Within Alaska, the end of evening civil twilight and the beginning of morning civil twilight, as defined for each locality.

**SUPPLEMENTAL WEATHER SERVICE LOCATION**– Airport facilities staffed with contract

personnel who take weather observations and provide current local weather to pilots via telephone or radio. (All other services are provided by the parent FSS.)

**SUPPS**– Refers to ICAO Document 7030 Regional Supplementary Procedures. SUPPS contain procedures for each ICAO Region which are unique to that Region and are not covered in the worldwide provisions identified in the ICAO Air Navigation Plan. Procedures contained in Chapter 8 are based in part on those published in SUPPS.

**SURFACE AREA**– The airspace contained by the lateral boundary of the Class B, C, D, or E airspace designated for an airport that begins at the surface and extends upward.

**SURPIC**– A description of surface vessels in the area of a Search and Rescue incident including their predicted positions and their characteristics.

(Refer to FAA Order JO 7110.65, Para 10–6–4, INFLIGHT CONTINGENCIES.)

**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.

(Refer to AIM.)

**SWAP**–

(See SEVERE WEATHER AVOIDANCE PLAN.)

**SWSL**–

(See SUPPLEMENTAL WEATHER SERVICE LOCATION.)

**SYSTEM STRATEGIC NAVIGATION**– Military activity accomplished by navigating along a preplanned route using internal aircraft systems to maintain a desired track. This activity normally requires a lateral route width of 10 NM and altitude range of 1,000 feet to 6,000 feet AGL with some route segments that permit terrain following.



# T

## TACAN–

(See TACTICAL AIR NAVIGATION.)

**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.

**TACTICAL AIR NAVIGATION (TCAN)**– An ultra-high frequency electronic rho-theta air navigation aid which provides suitably equipped aircraft a continuous indication of bearing and distance to the TACAN station.

(See VORTAC.)

(Refer to AIM.)

**TAILWIND**– Any wind more than 90 degrees to the longitudinal axis of the runway. The magnetic direction of the runway shall be used as the basis for determining the longitudinal axis.

## TAKEOFF AREA–

(See LANDING AREA.)

**TAKEOFF DISTANCE AVAILABLE (TODA)**– The takeoff run available plus the length of any remaining runway or clearway beyond the far end of the takeoff run available.

(See ICAO term TAKEOFF DISTANCE AVAILABLE.)

**TAKEOFF DISTANCE AVAILABLE [ICAO]**– The length of the takeoff run available plus the length of the clearway, if provided.

**TAKEOFF HOLD LIGHTS (THL)**– The THL system is composed of in-pavement lighting in a double, longitudinal row of lights aligned either side of the runway centerline. The lights are focused toward the arrival end of the runway at the “line up and wait” point, and they extend for 1,500 feet in front of the holding aircraft. Illuminated red lights indicate to an aircraft in position for takeoff or rolling that it is unsafe to takeoff because the runway is occupied or about to be occupied by an aircraft or vehicle.

**TAKEOFF ROLL** – The process whereby an aircraft is aligned with the runway centerline and the aircraft is moving with the intent to take off. For helicopters,

this pertains to the act of becoming airborne after departing a takeoff area.

**TAKEOFF RUN AVAILABLE (TORA)** – The runway length declared available and suitable for the ground run of an airplane taking off.

(See ICAO term TAKEOFF RUN AVAILABLE.)

**TAKEOFF RUN AVAILABLE [ICAO]**– The length of runway declared available and suitable for the ground run of an aeroplane take-off.

**TARGET**– The indication shown on a display resulting from a primary radar return, a radar beacon reply, or an ADS-B report. The specific target symbol presented to ATC may vary based on the surveillance source and automation platform.

(See ASSOCIATED.)

(See DIGITAL TARGET.)

(See DIGITIZED RADAR TARGET.)

(See FUSED TARGET.)

(See PRIMARY RADAR TARGET.)

(See RADAR.)

(See SECONDARY RADAR TARGET.)

(See ICAO term TARGET.)

(See UNASSOCIATED.)

**TARGET [ICAO]**– 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 RESOLUTION**– A process to ensure that correlated radar targets do not touch. Target resolution must be applied as follows:

**a.** Between the edges of two primary targets or the edges of the ASR-9/11 primary target symbol.

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

**c.** Between the ends of two beacon control slashes.

Note 1: Mandatory traffic advisories and safety alerts must be issued when this procedure is used.

Note 2: This procedure must not be used when utilizing mosaic radar systems or multi-sensor mode.

## TARGET SYMBOL–

(See TARGET.)

(See ICAO term TARGET.)

**TARMAC DELAY**– The holding of an aircraft on the ground either before departure or after landing with no opportunity for its passengers to deplane.

**TARMAC DELAY AIRCRAFT**– An aircraft whose pilot-in-command has requested to taxi to the ramp, gate, or alternate deplaning area to comply with the Three-hour Tarmac Rule.

**TARMAC DELAY REQUEST**– A request by the pilot-in-command to taxi to the ramp, gate, or alternate deplaning location to comply with the Three-hour Tarmac Rule.

**TAS**–

(See **TERMINAL AUTOMATION SYSTEMS**.)

**TAWS**–

(See **TERRAIN AWARENESS WARNING SYSTEM**.)

**TAXI**– The movement of an airplane under its own power on the surface of an airport (14 CFR Section 135.100 [Note]). Also, it describes the surface movement of helicopters equipped with wheels.

(See **AIR TAXI**.)

(See **HOVER TAXI**.)

(Refer to 14 CFR Section 135.100.)

(Refer to **AIM**.)

**TAXI PATTERNS**– Patterns established to illustrate the desired flow of ground traffic for the different runways or airport areas available for use.

**TCAS**–

(See **TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM**.)

**TCH**–

(See **THRESHOLD CROSSING HEIGHT**.)

**TCLT**–

(See **TENTATIVE CALCULATED LANDING TIME**.)

**TDLS**–

(See **TERMINAL DATA LINK SYSTEM**.)

**TDZE**–

(See **TOUCHDOWN ZONE ELEVATION**.)

**TELEPHONE INFORMATION BRIEFING SERVICE**– A continuous telephone recording of meteorological and/or aeronautical information.

(Refer to **AIM**.)

**TEMPORARY FLIGHT RESTRICTION (TFR)**– A TFR is a regulatory action issued by the FAA via the U.S. NOTAM System, under the authority of United States Code, Title 49. TFRs are issued within the sovereign airspace of the United States and its territories to restrict certain aircraft from operating within a defined area on a temporary basis to protect persons or property in the air or on the ground. While not all inclusive, TFRs may be issued for disaster or hazard situations such as: toxic gas leaks or spills, fumes from flammable agents, aircraft accident/incident sites, aviation or ground resources engaged in wildfire suppression, or aircraft relief activities following a disaster. TFRs may also be issued in support of VIP movements, for reasons of national security; or when determined necessary for the management of air traffic in the vicinity of aerial demonstrations or major sporting events. NAS users or other interested parties should contact a FSS for TFR information. Additionally, TFR information can be found in automated briefings, NOTAM publications, and on the internet at <http://www.faa.gov>. The FAA also distributes TFR information to aviation user groups for further dissemination.

**TENTATIVE CALCULATED LANDING TIME (TCLT)**– A projected time calculated for adapted vertex for each arrival aircraft based upon runway configuration, airport acceptance rate, airport arrival delay period, and other metered arrival aircraft. This time is either the VTA of the aircraft or the TCLT/ACLT of the previous aircraft plus the AAI, whichever is later. This time will be updated in response to an aircraft's progress and its current relationship to other arrivals.

**TERMINAL AREA**– A general term used to describe airspace in which approach control service or airport traffic control service is provided.

**TERMINAL AREA FACILITY**– A facility providing air traffic control service for arriving and departing IFR, VFR, Special VFR, and on occasion en route aircraft.

(See **APPROACH CONTROL FACILITY**.)

(See **TOWER**.)

**TERMINAL AUTOMATION SYSTEMS (TAS)**– TAS is used to identify the numerous automated tracking systems including ARTS IIE, ARTS IIIA, ARTS IIIE, STARS, and MEARTS.

**TERMINAL DATA LINK SYSTEM (TDLS)**– A system that provides Digital Automatic Terminal

Information Service (D-ATIS) both on a specified radio frequency and also, for subscribers, in a text message via data link to the cockpit or to a gate printer. TDLS also provides Pre-departure Clearances (PDC), at selected airports, to subscribers, through a service provider, in text to the cockpit or to a gate printer. In addition, TDLS will emulate the Flight Data Input/Output (FDIO) information within the control tower.

**TERMINAL RADAR SERVICE AREA**– Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. The AIM contains an explanation of TRSA. TRSAs are depicted on VFR aeronautical charts. Pilot participation is urged but is not mandatory.

**TERMINAL VFR RADAR SERVICE**– A national program instituted to extend the terminal radar services provided instrument flight rules (IFR) aircraft to visual flight rules (VFR) aircraft. The program is divided into four types service referred to as basic radar service, terminal radar service area (TRSA) service, Class B service and Class C service. The type of service provided at a particular location is contained in the Chart Supplement U.S.

**a. Basic Radar Service**– These services are provided for VFR aircraft by all commissioned terminal radar facilities. Basic radar service includes safety alerts, traffic advisories, limited radar vectoring when requested by the pilot, and sequencing at locations where procedures have been established for this purpose and/or when covered by a letter of agreement. The purpose of this service is to adjust the flow of arriving IFR and VFR aircraft into the traffic pattern in a safe and orderly manner and to provide traffic advisories to departing VFR aircraft.

**b. TRSA Service**– This service provides, in addition to basic radar service, sequencing of all IFR and participating VFR aircraft to the primary airport and separation between all participating VFR aircraft. The purpose of this service is to provide separation between all participating VFR aircraft and all IFR aircraft operating within the area defined as a TRSA.

**c. Class C Service**– This service provides, in addition to basic radar service, approved separation between IFR and VFR aircraft, and sequencing of

VFR aircraft, and sequencing of VFR arrivals to the primary airport.

**d. Class B Service**– This service provides, in addition to basic radar service, approved separation of aircraft based on IFR, VFR, and/or weight, and sequencing of VFR arrivals to the primary airport(s).

(See CONTROLLED AIRSPACE.)

(See TERMINAL RADAR SERVICE AREA.)

(Refer to AIM.)

(Refer to CHART SUPPLEMENT U.S.)

**TERMINAL-VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE STATION (TVOR)**– A very high frequency terminal omnirange station located on or near an airport and used as an approach aid.

(See NAVIGATIONAL AID.)

(See VOR.)

**TERRAIN AWARENESS WARNING SYSTEM (TAWS)**– An on-board, terrain proximity alerting system providing the aircrew ‘Low Altitude warnings’ to allow immediate pilot action.

**TERRAIN FOLLOWING**– The flight of a military aircraft maintaining a constant AGL altitude above the terrain or the highest obstruction. The altitude of the aircraft will constantly change with the varying terrain and/or obstruction.

**TETRAHEDRON**– A device normally located on uncontrolled airports and used as a landing direction indicator. The small end of a tetrahedron points in the direction of landing. At controlled airports, the tetrahedron, if installed, should be disregarded because tower instructions supersede the indicator.

(See SEGMENTED CIRCLE.)

(Refer to AIM.)

**TF**–

(See TERRAIN FOLLOWING.)

**THAT IS CORRECT**– The understanding you have is right.

**THA**–

(See TRANSITIONAL HAZARD AREA.)

**THREE-HOUR TARMAC RULE**– Rule that relates to Department of Transportation (DOT) requirements placed on airlines when tarmac delays are anticipated to reach 3 hours.

**360 OVERHEAD**–

(See OVERHEAD MANEUVER.)

**THRESHOLD**– The beginning of that portion of the runway usable for landing.

(See **AIRPORT LIGHTING**.)

(See **DISPLACED THRESHOLD**.)

**THRESHOLD CROSSING HEIGHT**– The theoretical height above the runway threshold at which the aircraft's glideslope antenna would be if the aircraft maintains the trajectory established by the mean ILS glideslope or the altitude at which the calculated glidepath of an RNAV or GPS approaches.

(See **GLIDESLOPE**.)

(See **THRESHOLD**.)

**THRESHOLD LIGHTS**–

(See **AIRPORT LIGHTING**.)

**TIBS**–

(See **TELEPHONE INFORMATION BRIEFING SERVICE**.)

**TIE-IN FACILITY**– The FSS primarily responsible for providing FSS services, including telecommunications services for landing facilities or navigational aids located within the boundaries of a flight plan area (FPA). Three-letter identifiers are assigned to each FSS/FPA and are annotated as tie-in facilities in the Chart Supplement U.S., the Alaska Supplement, the Pacific Supplement, and FAA Order JO 7350.9, Location Identifiers. Large consolidated FSS facilities may have many tie-in facilities or FSS sectors within one facility.

(See **FLIGHT PLAN AREA**.)

(See **FLIGHT SERVICE STATION**.)

**TIME BASED FLOW MANAGEMENT (TBFM)**–

The hardware, software, methods, processes, and initiatives to manage air traffic flows based on time to balance air traffic demand with system capacity, and support the management of PBN. This includes, but not limited to, Adjacent Center Metering (ACM), En Route Departure Capability (EDC), Ground-based Interval Management-Spacing (GIM-S), Integrated Departure/Arrival Capability (IDAC), Single Center Metering (SCM), Time-Based Metering (TBM), Time-Based Scheduling (TBS), and Extended/Coupled Metering.

**TIME GROUP**– Four digits representing the hour and minutes from the Coordinated Universal Time (UTC) clock. FAA uses UTC for all operations. The term “ZULU” may be used to denote UTC. The word “local” or the time zone equivalent shall be used to denote local when local time is given during radio and

telephone communications. When written, a time zone designator is used to indicate local time; e.g., “0205M” (Mountain). The local time may be based on the 24-hour clock system. The day begins at 0000 and ends at 2359.

**TIS-B**–

(See **TRAFFIC INFORMATION SERVICE-BROADCAST**.)

**TMPA**–

(See **TRAFFIC MANAGEMENT PROGRAM ALERT**.)

**TMU**–

(See **TRAFFIC MANAGEMENT UNIT**.)

**TODA**–

(See **TAKEOFF DISTANCE AVAILABLE**.)

(See ICAO term **TAKEOFF DISTANCE AVAILABLE**.)

**TOI**–

(See **TRACK OF INTEREST**.)

**TOP ALTITUDE**– In reference to SID published altitude restrictions, the charted “maintain” altitude contained in the procedure description or assigned by ATC.

**TORA**–

(See **TAKEOFF RUN AVAILABLE**.)

(See ICAO term **TAKEOFF RUN AVAILABLE**.)

**TORCHING**– The burning of fuel at the end of an exhaust pipe or stack of a reciprocating aircraft engine, the result of an excessive richness in the fuel air mixture.

**TOS**–

(See **TRAJECTORY OPTIONS SET**.)

**TOTAL ESTIMATED ELAPSED TIME [ICAO]**– For IFR flights, the estimated time required from takeoff 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 takeoff to arrive over the destination aerodrome.

(See ICAO term **ESTIMATED ELAPSED TIME**.)

**TOUCH-AND-GO**– An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway.

**TOUCH-AND-GO LANDING–**

(See TOUCH-AND-GO.)

**TOUCHDOWN–**

**a.** The point at which an aircraft first makes contact with the landing surface.

**b.** Concerning a precision radar approach (PAR), it is the point where the glide path intercepts the landing surface.

(See ICAO term TOUCHDOWN.)

**TOUCHDOWN [ICAO]–** The point where the nominal glide path intercepts the runway.

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

**TOUCHDOWN RVR–**

(See VISIBILITY.)

**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.

(See ICAO term TOUCHDOWN ZONE.)

**TOUCHDOWN ZONE [ICAO]–** The portion of a runway, beyond the threshold, where it is intended landing aircraft first contact the runway.

**TOUCHDOWN ZONE ELEVATION–** The highest elevation in the first 3,000 feet of the landing surface. TDZE is indicated on the instrument approach procedure chart when straight-in landing minimums are authorized.

(See TOUCHDOWN ZONE.)

**TOUCHDOWN ZONE LIGHTING–**

(See AIRPORT LIGHTING.)

**TOWER–** A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. Authorizes aircraft to land or takeoff at the airport controlled by the tower or to transit the Class D airspace area regardless of flight plan or weather

conditions (IFR or VFR). A tower may also provide approach control services (radar or nonradar).

(See AIRPORT TRAFFIC CONTROL SERVICE.)

(See APPROACH CONTROL FACILITY.)

(See APPROACH CONTROL SERVICE.)

(See MOVEMENT AREA.)

(See TOWER EN ROUTE CONTROL SERVICE.)

(See ICAO term AERODROME CONTROL TOWER.)

(Refer to AIM.)

**TOWER EN ROUTE CONTROL SERVICE–** The control of IFR en route traffic within delegated airspace between two or more adjacent approach control facilities. This service is designed to expedite traffic and reduce control and pilot communication requirements.

**TOWER TO TOWER–**

(See TOWER EN ROUTE CONTROL SERVICE.)

**TRACEABLE PRESSURE STANDARD–** The facility station pressure instrument, with certification/calibration traceable to the National Institute of Standards and Technology. Traceable pressure standards may be mercurial barometers, commissioned ASOS or dual transducer AWOS, or portable pressure standards or DASI.

**TRACK–** The actual flight path of an aircraft over the surface of the earth.

(See COURSE.)

(See FLIGHT PATH.)

(See ROUTE.)

(See ICAO term TRACK.)

**TRACK [ICAO]–** 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).

**TRACK OF INTEREST (TOI)–** Displayed data representing an airborne object that threatens or has the potential to threaten North America or National Security. Indicators may include, but are not limited to: noncompliance with air traffic control instructions or aviation regulations; extended loss of communications; unusual transmissions or unusual flight behavior; unauthorized intrusion into controlled airspace or an ADIZ; noncompliance with issued flight restrictions/security procedures; or unlawful interference with airborne flight crews, up to and including hijack. In certain circumstances, an object

may become a TOI based on specific and credible intelligence pertaining to that particular aircraft/object, its passengers, or its cargo.

**TRACK OF INTEREST RESOLUTION**– A TOI will normally be considered resolved when: the aircraft/object is no longer airborne; the aircraft complies with air traffic control instructions, aviation regulations, and/or issued flight restrictions/security procedures; radio contact is re-established and authorized control of the aircraft is verified; the aircraft is intercepted and intent is verified to be nonthreatening/nonhostile; TOI was identified based on specific and credible intelligence that was later determined to be invalid or unreliable; or displayed data is identified and characterized as invalid.

### **TRAFFIC**–

**a.** 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:

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.

**b.** A term used by ATC to refer to one or more aircraft.

**TRAFFIC ADVISORIES**– Advisories issued to alert pilots to other known or observed air traffic which may be in such proximity to the position or intended route of flight of their aircraft to warrant their attention. Such advisories may be based on:

- a.** Visual observation.
- b.** Observation of radar identified and nonidentified aircraft targets on an ATC radar display, or
- c.** Verbal reports from pilots or other facilities.

**Note 1:** The word “traffic” followed by additional information, if known, is used to provide such advisories; e.g., “Traffic, 2 o’clock, one zero miles, southbound, eight thousand.”

**Note 2:** Traffic advisory service will be provided to the extent possible depending on higher priority duties of the controller or other limitations; e.g., radar limitations, volume of traffic, frequency congestion, or controller workload. Radar/nonradar traffic advisories do not relieve the pilot of his/her responsibility to see and avoid other aircraft. Pilots are cautioned that there are many times when the controller is not able to give traffic

advisories concerning all traffic in the aircraft’s proximity; in other words, when a pilot requests or is receiving traffic advisories, he/she should not assume that all traffic will be issued.

(Refer to AIM.)

**TRAFFIC ALERT (aircraft call sign), TURN (left/right) IMMEDIATELY, (climb/descend) AND MAINTAIN (altitude).**

(See SAFETY ALERT.)

**TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS)**– 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 INFORMATION**–

(See TRAFFIC ADVISORIES.)

**TRAFFIC INFORMATION SERVICE–BROADCAST (TIS-B)**– The broadcast of ATC derived traffic information to ADS-B equipped (1090ES or UAT) aircraft. The source of this traffic information is derived from ground-based air traffic surveillance sensors, typically from radar targets. TIS-B service will be available throughout the NAS where there are both adequate surveillance coverage (radar) and adequate broadcast coverage from ADS-B ground stations. Loss of TIS-B will occur when an aircraft enters an area not covered by the GBT network. If this occurs in an area with adequate surveillance coverage (radar), nearby aircraft that remain within the adequate broadcast coverage (ADS-B) area will view the first aircraft. TIS-B may continue when an aircraft enters an area with inadequate surveillance coverage (radar); nearby aircraft that remain within the adequate broadcast coverage (ADS-B) area will not view the first aircraft.

**TRAFFIC IN SIGHT**– Used by pilots to inform a controller that previously issued traffic is in sight.

(See NEGATIVE CONTACT.)

(See TRAFFIC ADVISORIES.)

**TRAFFIC MANAGEMENT PROGRAM ALERT**– A term used in a Notice to Airmen (NOTAM) issued in conjunction with a special traffic management program to alert pilots to the existence of the program and to refer them to either the Notices to Airmen publication or a special traffic management program advisory message for program details. The contraction TMPA is used in NOTAM text.

**TRAFFIC MANAGEMENT UNIT**– The entity in ARTCCs and designated terminals directly involved in the active management of facility traffic. Usually under the direct supervision of an assistant manager for traffic management.

**TRAFFIC NO FACTOR**– Indicates that the traffic described in a previously issued traffic advisory is no factor.

**TRAFFIC NO LONGER OBSERVED**– Indicates that the traffic described in a previously issued traffic advisory is no longer depicted on radar, but may still be a factor.

**TRAFFIC PATTERN**– The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. 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.

(See STRAIGHT-IN APPROACH VFR.)

(See TAXI PATTERNS.)

(See ICAO term AERODROME TRAFFIC CIRCUIT.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**TRAFFIC SITUATION DISPLAY (TSD)**– TSD is a computer system that receives radar track data from all 20 CONUS ARTCCs, organizes this data into a mosaic display, and presents it on a computer screen. The display allows the traffic management coordinator multiple methods of selection and highlighting of individual aircraft or groups of aircraft. The user has the option of superimposing these aircraft positions

over any number of background displays. These background options include ARTCC boundaries, any stratum of en route sector boundaries, fixes, airways, military and other special use airspace, airports, and geopolitical boundaries. By using the TSD, a coordinator can monitor any number of traffic situations or the entire systemwide traffic flows.

**TRAJECTORY**– A EDST representation of the path an aircraft is predicted to fly based upon a Current Plan or Trial Plan.

(See EN ROUTE DECISION SUPPORT TOOL.)

**TRAJECTORY MODELING**– The automated process of calculating a trajectory.

**TRAJECTORY OPTIONS SET (TOS)**– A TOS is an electronic message, submitted by the operator, that is used by the Collaborative Trajectory Options Program (CTOP) to manage the airspace captured in the traffic management program. The TOS will allow the operator to express the route and delay trade-off options that they are willing to accept.

**TRANSCRIBED WEATHER BROADCAST (TWEB)**– A continuous recording of meteorological and aeronautical information that is broadcast on L/MF and VOR facilities for pilots. (Provided only in Alaska.)

(Refer to AIM.)

**TRANSFER OF CONTROL**– That action whereby the responsibility for the separation of an aircraft is transferred from one controller to another.

(See ICAO term TRANSFER OF CONTROL.)

**TRANSFER OF CONTROL [ICAO]**– Transfer of responsibility for providing air traffic control service.

**TRANSFERRING CONTROLLER**– A controller/facility transferring control of an aircraft to another controller/facility.

(See ICAO term TRANSFERRING UNIT/CONTROLLER.)

**TRANSFERRING FACILITY**–

(See TRANSFERRING CONTROLLER.)

**TRANSFERRING UNIT/CONTROLLER [ICAO]**– 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–**

**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 published procedure (DP Transition) used to connect the basic DP to one of several en route airways/jet routes, or a published procedure (STAR Transition) used to connect one of several en route airways/jet routes to the basic STAR.

(Refer to DP/STAR Charts.)

**TRANSITION POINT–** A point at an adapted number of miles from the vertex at which an arrival aircraft would normally commence descent from its en route altitude. This is the first fix adapted on the arrival speed segments.

**TRANSITION WAYPOINT–** The waypoint that defines the beginning of a runway or en route transition on an RNAV SID or STAR.

**TRANSITIONAL AIRSPACE–** That portion of controlled airspace wherein aircraft change from one phase of flight or flight condition to another.

**TRANSITIONAL HAZARD AREA (THA)–** Used by ATC. Airspace normally associated with an Aircraft Hazard Area within which the flight of aircraft is subject to restrictions.

(See AIRCRAFT HAZARD AREA.)

(See CONTINGENCY HAZARD AREA.)

(See REFINED HAZARD AREA.)

**TRANSMISSOMETER–** An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. It is the measurement source for determining runway visual range (RVR).

(See VISIBILITY.)

**TRANSMITTING IN THE BLIND–** A transmission from one station to other stations in circumstances where two-way communication cannot be established, but where it is believed that the called stations may be able to receive the transmission.

**TRANSPONDER–** The airborne radar beacon receiver/transmitter portion of the Air Traffic Control Radar Beacon System (ATCRBS) which automatically receives radio signals from interrogators on the ground, and selectively replies with a specific reply pulse or pulse group only to those interrogations

being received on the mode to which it is set to respond.

(See INTERROGATOR.)

(See ICAO term TRANSPONDER.)

(Refer to AIM.)

**TRANSPONDER [ICAO]–** A receiver/transmitter which will generate a reply signal upon proper interrogation; the interrogation and reply being on different frequencies.

**TRANSPONDER CODES–**

(See CODES.)

**TRANSPONDER OBSERVED –** Phraseology used to inform a VFR pilot the aircraft's assigned beacon code and position have been observed. Specifically, this term conveys to a VFR pilot the transponder reply has been observed and its position correlated for transit through the designated area.

**TRIAL PLAN–** A proposed amendment which utilizes automation to analyze and display potential conflicts along the predicted trajectory of the selected aircraft.

**TRSA–**

(See TERMINAL RADAR SERVICE AREA.)

**TSD–**

(See TRAFFIC SITUATION DISPLAY.)

**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.

**TURBULENCE–** An atmospheric phenomenon that causes changes in aircraft altitude, attitude, and or airspeed with aircraft reaction depending on intensity. Pilots report turbulence intensity according to aircraft's reaction as follows:

**a. Light –** Causes slight, erratic changes in altitude and or attitude (pitch, roll, or yaw).

**b. Moderate–** Similar to Light but of greater intensity. Changes in altitude and or attitude occur but the aircraft remains in positive control at all times. It usually causes variations in indicated airspeed.

**c. Severe–** Causes large, abrupt changes in altitude and or attitude. It usually causes large variations in indicated airspeed. Aircraft may be momentarily out of control.

**d. Extreme**– The aircraft is violently tossed about and is practically impossible to control. It may cause structural damage.

(See CHOP.)

(Refer to AIM.)

**TURN ANTICIPATION**– (maneuver anticipation).

**TVOR**–

(See TERMINAL-VERY HIGH FREQUENCY  
OMNIDIRECTIONAL RANGE STATION.)

**TWEB**–

(See TRANSCRIBED WEATHER BROADCAST.)

**TWO-WAY RADIO COMMUNICATIONS FAILURE**–

(See LOST COMMUNICATIONS.)



# U

**UHF–**

(See ULTRAHIGH FREQUENCY.)

**ULTRAHIGH FREQUENCY (UHF)–** 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.

**ULTRALIGHT VEHICLE–** A single-occupant aeronautical vehicle operated for sport or recreational purposes which does not require FAA registration, an airworthiness certificate, or pilot certification. Operation of an ultralight vehicle in certain airspace requires authorization from ATC.

(Refer to 14 CFR Part 103.)

**UNABLE–** Indicates inability to comply with a specific instruction, request, or clearance.

**UNASSOCIATED–** A radar target that does not display a data block with flight identification and altitude information.

(See ASSOCIATED.)

**UNCONTROLLED AIRSPACE–** Airspace in which aircraft are not subject to controlled airspace (Class A, B, C, D, or E) separation criteria.

**UNDER THE HOOD–** Indicates that the pilot is using a hood to restrict visibility outside the cockpit while simulating instrument flight. An appropriately rated pilot is required in the other control seat while this operation is being conducted.

(Refer to 14 CFR Part 91.)

**UNFROZEN–** The Scheduled Time of Arrival (STA) tags, which are still being rescheduled by the time based flow management (TBFM) calculations. The aircraft will remain unfrozen until the time the corresponding estimated time of arrival (ETA) tag passes the preset freeze horizon for that aircraft's stream class. At this point the automatic rescheduling will stop, and the STA becomes "frozen."

**UNICOM–** A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

(See CHART SUPPLEMENT U.S.)

(Refer to AIM.)

**UNMANNED AIRCRAFT (UA)–** A device used or intended to be used for flight that has no onboard pilot. This device can be any type of airplane, helicopter, airship, or powered-lift aircraft. Unmanned free balloons, moored balloons, tethered aircraft, gliders, and unmanned rockets are not considered to be a UA.

**UNMANNED AIRCRAFT SYSTEM (UAS)–** An unmanned aircraft and its associated elements related to safe operations, which may include control stations (ground, ship, or air based), control links, support equipment, payloads, flight termination systems, and launch/recovery equipment. It consists of three elements: unmanned aircraft, control station, and data link.

**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.

(See PUBLISHED ROUTE.)

(See ROUTE.)

**UNRELIABLE (GPS/WAAS)–** An advisory to pilots indicating the expected level of service of the GPS and/or WAAS may not be available. Pilots must then determine the adequacy of the signal for desired use.

**UNSERVICEABLE (U/S)**

(See OUT OF SERVICE/UNSERVICEABLE.)

**UPWIND LEG–**

(See TRAFFIC PATTERN.)

**URGENCY–** A condition of being concerned about safety and of requiring timely but not immediate assistance; a potential distress condition.

(See ICAO term URGENCY.)

**URGENCY [ICAO]–** A condition concerning the safety of an aircraft or other vehicle, or of person on board or in sight, but which does not require immediate assistance.

**USAFIB–**

(See ARMY AVIATION FLIGHT INFORMATION BULLETIN.)



# V

## VASI–

(See VISUAL APPROACH SLOPE INDICATOR.)

## VCOA–

(See VISUAL CLIMB OVER AIRPORT.)

## VDP–

(See VISUAL DESCENT POINT.)

**VECTOR**– A heading issued to an aircraft to provide navigational guidance by radar.

(See ICAO term RADAR VECTORING.)

**VERIFY**– Request confirmation of information; e.g., “verify assigned altitude.”

**VERIFY SPECIFIC DIRECTION OF TAKEOFF (OR TURNS AFTER TAKEOFF)**– Used by ATC to ascertain an aircraft’s direction of takeoff and/or direction of turn after takeoff. It is normally used for IFR departures from an airport not having a control tower. When direct communication with the pilot is not possible, the request and information may be relayed through an FSS, dispatcher, or by other means.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

**VERTEX**– The last fix adapted on the arrival speed segments. Normally, it will be the outer marker of the runway in use. However, it may be the actual threshold or other suitable common point on the approach path for the particular runway configuration.

**VERTEX TIME OF ARRIVAL**– A calculated time of aircraft arrival over the adapted vertex for the runway configuration in use. The time is calculated via the optimum flight path using adapted speed segments.

**VERTICAL NAVIGATION (VNAV)**– A function of area navigation (RNAV) equipment which calculates, displays, and provides vertical guidance to a profile or path.

**VERTICAL SEPARATION**– Separation between aircraft expressed in units of vertical distance.

(See SEPARATION.)

**VERTICAL TAKEOFF AND LANDING AIRCRAFT (VTOL)**– Aircraft capable of vertical climbs

and/or descents and of using very short runways or small areas for takeoff and landings. These aircraft include, but are not limited to, helicopters.

(See SHORT TAKEOFF AND LANDING AIRCRAFT.)

**VERY HIGH FREQUENCY (VHF)**– 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 HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION–**

(See VOR.)

**VERY LOW FREQUENCY (VLF)**– The frequency band between 3 and 30 kHz.

## VFR–

(See VISUAL FLIGHT RULES.)

**VFR AIRCRAFT**– An aircraft conducting flight in accordance with visual flight rules.

(See VISUAL FLIGHT RULES.)

**VFR CONDITIONS**– 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 FAA Order JO 7110.65. When used as an ATC clearance/instruction, the term may be abbreviated “VFR;” e.g., “MAINTAIN VFR,” “CLIMB/DESCEND VFR,” etc.

## VFR FLIGHT–

(See VFR AIRCRAFT.)

**VFR MILITARY TRAINING ROUTES (VR)**– Routes used by the Department of Defense and associated Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training under VFR below 10,000 feet MSL at airspeeds in excess of 250 knots IAS.

**VFR NOT RECOMMENDED**– An advisory provided by a flight service station to a pilot during a preflight or inflight weather briefing that flight under visual flight rules is not recommended. To be given when the current and/or forecast weather conditions are at or below VFR minimums. It does not abrogate the pilot's authority to make his/her own decision.

**VFR-ON-TOP**– ATC authorization for an IFR aircraft to operate in VFR conditions at any appropriate VFR altitude (as specified in 14 CFR and as restricted by ATC). A pilot receiving this authorization must comply with the VFR visibility, distance from cloud criteria, and the minimum IFR altitudes specified in 14 CFR Part 91. The use of this term does not relieve controllers of their responsibility to separate aircraft in Class B and Class C airspace or TRSAs as required by FAA Order JO 7110.65.

**VFR TERMINAL AREA CHARTS**–  
(See AERONAUTICAL CHART.)

**VFR WAYPOINT**–  
(See WAYPOINT.)

**VHF**–  
(See VERY HIGH FREQUENCY.)

**VHF OMNIDIRECTIONAL RANGE/TACTICAL AIR NAVIGATION**–  
(See VORTAC.)

**VIDEO MAP**– An electronically displayed map on the radar display that may depict data such as airports, heliports, runway centerline extensions, hospital emergency landing areas, NAVAIDs and fixes, reporting points, airway/route centerlines, boundaries, handoff points, special use tracks, obstructions, prominent geographic features, map alignment indicators, range accuracy marks, and/or minimum vectoring altitudes.

**VISIBILITY**– The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by

night. Visibility is reported as statute miles, hundreds of feet or meters.

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**a. Flight Visibility**– The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.

**b. Ground Visibility**– Prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.

**c. Prevailing Visibility**– The greatest horizontal visibility equaled or exceeded throughout at least half the horizon circle which need not necessarily be continuous.

**d. Runway Visual Range (RVR)**– An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end. It is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range. It is based on the measurement of a transmissometer made near the touchdown point of the instrument runway and is reported in hundreds of feet. RVR, where available, is used in lieu of prevailing visibility in determining minimums for a particular runway.

**1. Touchdown RVR**– The RVR visibility readout values obtained from RVR equipment serving the runway touchdown zone.

**2. Mid-RVR**– The RVR readout values obtained from RVR equipment located midfield of the runway.

**3. Rollout RVR**– The RVR readout values obtained from RVR equipment located nearest the rollout end of the runway.

(See ICAO term FLIGHT VISIBILITY.)

(See ICAO term GROUND VISIBILITY.)

(See ICAO term RUNWAY VISUAL RANGE.)

(See ICAO term VISIBILITY.)

**VISIBILITY [ICAO]**– The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night.

**a. Flight Visibility**– The visibility forward from the cockpit of an aircraft in flight.

**b. Ground Visibility**– The visibility at an aerodrome as reported by an accredited observer.

**c. Runway Visual Range [RVR]**– The range over which the pilot of an aircraft on the centerline of a runway can see the runway surface markings or the lights delineating the runway or identifying its centerline.

**VISUAL APPROACH**– An approach conducted on an instrument flight rules (IFR) flight plan which authorizes the pilot to proceed visually and clear of clouds to the airport. The pilot must, at all times, have either the airport or the preceding aircraft in sight. This approach must be authorized and under the control of the appropriate air traffic control facility. Reported weather at the airport must be: ceiling at or above 1,000 feet, and visibility of 3 miles or greater.

(See ICAO term VISUAL APPROACH.)

**VISUAL APPROACH [ICAO]**– 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 APPROACH SLOPE INDICATOR (VASI)**–

(See AIRPORT LIGHTING.)

**VISUAL CLIMB OVER AIRPORT (VCOA)**– A departure option for an IFR aircraft, operating in visual meteorological conditions equal to or greater than the specified visibility and ceiling, to visually conduct climbing turns over the airport to the published “climb-to” altitude from which to proceed with the instrument portion of the departure. VCOA procedures are developed to avoid obstacles greater than 3 statute miles from the departure end of the runway as an alternative to complying with climb gradients greater than 200 feet per nautical mile. Pilots are responsible to advise ATC as early as possible of the intent to fly the VCOA option prior to departure. These textual procedures are published in the ‘Take-Off Minimums and (Obstacle) Departure Procedures’ section of the Terminal Procedures Publications and/or appear as an option on a Graphic ODP.

(See AIM.)

**VISUAL DESCENT POINT**– A defined point on the final approach course of a nonprecision straight-in approach procedure from which normal descent from the MDA to the runway touchdown point may be commenced, provided the approach threshold of that runway, or approach lights, or other markings identifiable with the approach end of that runway are clearly visible to the pilot.

**VISUAL FLIGHT RULES**– Rules that govern the procedures for conducting flight under visual conditions. The term “VFR” is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

(See INSTRUMENT FLIGHT RULES.)

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

(See VISUAL METEOROLOGICAL CONDITIONS.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**VISUAL HOLDING**– The holding of aircraft at selected, prominent geographical fixes which can be easily recognized from the air.

(See HOLDING FIX.)

**VISUAL METEOROLOGICAL CONDITIONS**– Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.

(See INSTRUMENT FLIGHT RULES.)

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

(See VISUAL FLIGHT RULES.)

**VISUAL SEGMENT**–

(See PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT.)

**VISUAL SEPARATION**– A means employed by ATC to separate aircraft in terminal areas and en route airspace in the NAS. 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.

(See SEE AND AVOID.)

(Refer to 14 CFR Part 91.)

VLF–

(See VERY LOW FREQUENCY.)

VMC–

(See VISUAL METEOROLOGICAL CONDITIONS.)

VOICE SWITCHING AND CONTROL SYSTEM (VSCS)– 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.

(Refer to AIM.)

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 National Airspace System. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature. Voice features may be used by ATC or FSS for transmitting instructions/information to pilots.

(See NAVIGATIONAL AID.)

(Refer to AIM.)

VOR TEST SIGNAL–

(See VOT.)

VORTAC– A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance measuring equipment (DME) at one site.

(See DISTANCE MEASURING EQUIPMENT.)

(See NAVIGATIONAL AID.)

(See TACAN.)

(See VOR.)

(Refer to AIM.)

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 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 super aircraft can be of extremely high velocity and hazardous to smaller aircraft.

(See AIRCRAFT CLASSES.)

(See WAKE TURBULENCE.)

(Refer to AIM.)

VOT– A ground facility which emits a test signal to check VOR receiver accuracy. Some VOTs are available to the user while airborne, and others are limited to ground use only.

(See CHART SUPPLEMENT U.S.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

VR–

(See VFR MILITARY TRAINING ROUTES.)

VSCS–

(See VOICE SWITCHING AND CONTROL SYSTEM.)

VTA–

(See VERTEX TIME OF ARRIVAL.)

VTOL AIRCRAFT–

(See VERTICAL TAKEOFF AND LANDING AIRCRAFT.)

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# **BRIEFING GUIDE**

**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**

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**1. PARAGRAPH NUMBER AND TITLE:**

1–2–6. ABBREVIATIONS

2–8–1. FURNISH RVR/RVV VALUES

2–8–2. ARRIVAL/DEPARTURE RUNWAY VISIBILITY

2–8–3. TERMINOLOGY

3–4–11. HIGH INTENSITY RUNWAY, RUNWAY CENTERLINE, AND TOUCHDOWN ZONE LIGHTS

**2. BACKGROUND:** The Runway Visual Value (RVV) systems are no longer operational in the NAS. There is no mention of this system in the Aeronautical Information Manual (AIM), or in the Aeronautical Information Publication (AIP) for the pilot community. This effort removes reference to RVV from all air traffic publications.

**3. CHANGE:****OLD****1–2–6. ABBREVIATIONS**

As used in this order, the abbreviations listed below have the following meanings indicated. (See TBL 1–2–1.)

*TBL 1–2–1***FAA Order JO 7110.65 Abbreviations**RVV . . . . . Runway visibility value**OLD****2–8–1. FURNISH RVR/RVV VALUES**

Where RVR or RVV equipment is operational, irrespective of subsequent operation or nonoperation of navigational or visual aids for the application of RVR/RVV as a takeoff or landing minima, furnish the values for the runway in use in accordance with Paragraph 2–8–3, Terminology.

**NOTE–**

*Readout capability of different type/model RVR equipment varies. For example, older equipment minimum readout value is 600 feet. Newer equipment may have minimum readout capability as low as 100 feet. Readout value increments also may differ. Older equipment have minimum readout increments of 200 feet. New equipment increments below 800 feet are 100 feet.*

**REFERENCE–**

*FAA Order 6560.10, Runway Visual Range (RVR).  
FAA Order 6750.24, Instrument Landing System (ILS) and Ancillary  
Electronic Component Configuration & Perf. Req.*

**OLD****2–8–2. ARRIVAL/DEPARTURE RUNWAY VISIBILITY**

**a.** Issue current touchdown RVR/RVV for the runway(s) in use:

**1.** When prevailing visibility is 1 mile or less regardless of the value indicated.

**NEW****1–2–6. ABBREVIATIONS**

No Change

No Change

Delete

**NEW****2–8–1. FURNISH RVR VALUES**

Where RVR equipment is operational, irrespective of subsequent operation or nonoperation 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 Paragraph 2–8–3, Terminology.

No Change

No Change

**NEW****2–8–2. ARRIVAL/DEPARTURE RUNWAY VISIBILITY**

**a.** Issue current touchdown RVR for the runway(s) in use:

No Change

2. When RVR/RVV indicates a reportable value regardless of the prevailing visibility.

**NOTE–**

Reportable values are: RVR 6,000 feet or less; RVV 1½ miles or less.

**a3 through b**

c. Local control must issue the current RVR/RVV to each aircraft prior to landing or departure in accordance with subparas a and b.

**OLD**

**2–8–3. TERMINOLOGY**

a. Provide RVR/RVV information by stating the runway, the abbreviation RVR/RVV, and the indicated value. When issued along with other weather elements, transmit these values in the normal sequence used for weather reporting.

**EXAMPLE–**

*“Runway One Four RVR Two Thousand Four Hundred.”*

*“Runway Three Two RVV Three Quarters.”*

**b through b EXAMPLE**

c. When there is a requirement to issue an RVR or RVV 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–**

*“Runway Three Six RVR more than Six Thousand.”*

*“Runway Niner RVR One Thousand, rollout less than Six Hundred.”*

d. When a readout indicates a rapidly varying visibility condition (1,000 feet or more for RVR; one or more reportable values for RVV), report the current value followed by the range of visibility variance.

**EXAMPLE–**

*“Runway Two Four RVR Two Thousand, variable One Thousand Six Hundred to Three Thousand.”*

*“Runway Three One RVV Three–quarters, variable One–quarter to One.”*

**REFERENCE–**

FAA Order JO 7110.65, Para 2–8–1, Furnish RVR/RVV Values.

2. When RVR indicates a reportable value regardless of the prevailing visibility.

**NOTE–**

Reportable values are RVR 6,000 feet or less.

**No Change**

c. Local control must issue the current RVR to each aircraft prior to landing or departure in accordance with subparagraphs a and b.

**NEW**

**2–8–3. TERMINOLOGY**

a. Provide RVR information by stating the runway, the abbreviation RVR, and the indicated value. When issued along with other weather elements, transmit these values in the normal sequence used for weather reporting.

**EXAMPLE–**

*“Runway One Four RVR Two Thousand Four Hundred.”*

**No Change**

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.

**No Change**

d. When a readout indicates a rapidly varying visibility condition (1,000 feet or more for RVR), report the current value followed by the range of visibility variance.

**EXAMPLE–**

*“Runway Two Four RVR Two Thousand, variable One Thousand Six Hundred to Three Thousand.”*

**REFERENCE–**

FAA Order JO 7110.65, Para 2–8–1, Furnish RVR Values.

**OLD****3-4-11. HIGH INTENSITY RUNWAY,  
RUNWAY CENTERLINE, AND  
TOUCHDOWN ZONE LIGHTS****Title through c****NEW****3-4-11. HIGH INTENSITY RUNWAY,  
RUNWAY CENTERLINE, AND  
TOUCHDOWN ZONE LIGHTS****No Change****OLD***TBL 3-4-8***HIRL, RCLS, TDZL Intensity Setting**

Step	Visibility	
	Day	Night
5	Less than 1 mile*	When requested
4	1 to but not including 2 miles*	Less than 1 mile*
3	2 to but not including 3 miles	1 to but not including 3 miles*
2	When requested	3 to 5 miles inclusive
1	When requested	More than 5 miles
*and/or appropriate RVR/RVV equivalent.		

**NEW***TBL 3-4-8***HIRL, RCLS, TDZL Intensity Setting**

Step	Visibility	
	Day	Night
5	Less than 1 mile*	When requested
4	1 to but not including 2 miles*	Less than 1 mile*
3	2 to but not including 3 miles	1 to but not including 3 miles*
2	When requested	3 to 5 miles inclusive
1	When requested	More than 5 miles
*and/or appropriate RVR equivalent.		

**1. PARAGRAPH NUMBER AND TITLE:**

2-3-8. AIRCRAFT EQUIPMENT SUFFIX

2-3-9. CLEARANCE STATUS

**2. BACKGROUND:** An aircraft's communication, navigation and surveillance (CNS) capabilities are identified by equipment codes entered in fields 10 and 18 of the International Civil Aviation Organization (ICAO) flight plan (FAA Form 7233-4). Automation translates these codes into the aircraft equipment suffix and displays the suffix to the controller. If there is a need to update the CNS capability, En Route and Oceanic controllers are better equipped to make the change by utilizing a template available to them and allowing the automation platform to generate the appropriate aircraft equipment suffix. Changing an aircraft equipment code by entering the new suffix preceded by a slant and not by changing the CNS equipment code may adversely alter or delete these codes. Offshore Flight Data Processing System (OFDPS) and Flight Data Processor 2000 (FDP 2000) facilities must verbally coordinate any CNS code changes with supported facilities as these automation platforms do not have the capability to accept and transmit amendments of these codes to supported automation platforms.

**3. CHANGE:****OLD****2-3-8. AIRCRAFT EQUIPMENT SUFFIX**

a. Indicate, for both VFR and IFR operations, the aircraft's radar transponder, DME, or navigation capability by adding the appropriate symbol, preceded by a slant. (See TBL 2-3-10.)

Add

Add

Add

**b** through **c** *EXAMPLE*

**d**. Utilize aircraft equipment suffix /H to indicate "RVSM-capable, no transponder."

**NEW****2-3-8. AIRCRAFT EQUIPMENT SUFFIX**

a. The aircraft equipment suffix identifying communication, navigation and surveillance (CNS) capability is generated by automation using the equipment codes of the ICAO flight plan. To change a suffix, the CNS equipment codes must be modified, allowing automation to translate them into the proper suffix. If using unsupported automation platforms (OFDPS and FDP2000), verbally coordinate changes with adjacent supported facilities.

b. ERAM and ATOP are best suited for making changes to the equipment codes in an ICAO flight plan. For FDIO entries, if uncertain of the proper format to correctly amend an equipment code, verbally coordinate the change with the appropriate en route facility.

**NOTE-**

Directly changing the equipment suffix with a symbol preceded by a slant instead of amending the aircraft equipment codes may unintentionally alter or delete other equipment codes.

c. For VFR operations, indicate the aircraft's transponder and navigation capabilities by adding the appropriate symbol, preceded by a slant (See Table 2-3-10).

Re-letter **d** through **e** *EXAMPLE*

Delete

**NOTE–**

/H is for ATC use only. Users are not authorized to file this suffix.

**NOTE–**

/H and /O are intended for ATC use only. These suffixes are not published in the Aeronautical Information Manual.

**OLD****2–3–9. CLEARANCE STATUS**

Title through b

**NEW****2–3–9. CLEARANCE STATUS**

No Change

**OLD**

TBL 2–3–10

**Aircraft Equipment Suffixes**

	Navigation Capability	Transponder Capability	Suffix
RVSM	Any	Failed transponder <u>or</u> Failed Mode C capability	/H
	No <u>GNSS</u> , No <u>RNAV</u>	Transponder with Mode C	/W
	RNAV, No GNSS	Transponder with Mode C	/Z
	GNSS	Transponder with Mode C	/L
<u>No RVSM</u>	No DME	No transponder	/X
		Transponder <u>with no</u> Mode C	/T
		Transponder with Mode C	/U
	DME	No transponder	/D
		Transponder <u>with no</u> Mode C	/B
		Transponder with Mode C	/A
	TACAN	No transponder	/M
		Transponder <u>with no</u> Mode C	/N
		Transponder with Mode C	/P
	RNAV, No GNSS	No transponder	/Y
		Transponder <u>with no</u> Mode C	/C
		Transponder with Mode C	/I
	GNSS	No transponder	/V
		Transponder <u>with no</u> Mode C	/S
		Transponder with Mode C	/G

**NEW***TBL 2-3-10***Aircraft Equipment Suffixes**

<b><u>Separation Standard</u></b>	<b>Navigation Capability</b>	<b>Transponder Capability</b>	<b>Suffix</b>
<b>RVSM</b>	Any	Failed transponder	/H
	<b><u>Any</u></b>	<b><u>Failed Mode C</u></b>	<b><u>/O</u></b>
	No <b><u>RNAV</u></b> , No <b><u>GNSS</u></b>	Transponder with Mode C	/W
	RNAV, No GNSS	Transponder with Mode C	/Z
	GNSS	Transponder with Mode C	/L
<b><u>Non-RVSM</u></b>	No DME	No transponder	/X
		Transponder, <b><u>no</u></b> Mode C	/T
		Transponder with Mode C	/U
	DME	No transponder	/D
		Transponder, <b><u>no</u></b> Mode C	/B
		Transponder with Mode C	/A
	TACAN	No transponder	/M
		Transponder, <b><u>no</u></b> Mode C	/N
		Transponder with Mode C	/P
	RNAV, No GNSS	No transponder	/Y
		Transponder, <b><u>no</u></b> Mode C	/C
		Transponder with Mode C	/I
	GNSS	No transponder	/V
		Transponder, <b><u>no</u></b> Mode C	/S
		Transponder with Mode C	/G

**1. PARAGRAPH NUMBER AND TITLE:**

2-4-9. ABBREVIATED TRANSMISSIONS

2-4-15. EMPHASIS FOR CLARITY

2-4-20. AIRCRAFT IDENTIFICATION

**2. BACKGROUND:** FAA Order JO 7610.12 Assignment and Authorization of Call Sign Designators and Associated Telephonies is the FAA ATO source document for authorization of use policies for U.S. registered aircraft using ICAO three letter designators (ICAO 3LD), U.S. special call sign designators, local call signs, and associated telephonies. The assignment and authorization of call signs is an air traffic management (ATM) security measure for aircraft identification that is fundamental to the security and safety of the NAS. FAA ATO must ensure that every call sign is used within the NAS in accordance with its authorization. As such, guidance for air traffic control use of call signs must align with the policies set forth in FAA Order JO 7610.12. The changes detailed in this DCP update align the guidance and terminology for aircraft identification and call sign use contained in FAA Order JO 7110.65, Air Traffic Control, with the policies set forth in FAA Order JO 7610.12.

**3. CHANGE:****OLD****2-4-9. ABBREVIATED TRANSMISSIONS**

Transmissions may be abbreviated as follows:

**NEW****2-4-9. ABBREVIATED TRANSMISSIONS**

No Change

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 an FAA authorized call sign.

**REFERENCE–**  
*FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.*

Add

Add

Add

Add

Add

Add

Add

**b through d**

## **OLD**

### **2–4–15. EMPHASIS FOR CLARITY**

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

Add

Add

Add

Add

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

a. Use the identification prefix and the last 3 digits or letters of the aircraft identification after communications have been established **with a U.S. civil aircraft using the aircraft registration as identification.**

Delete

### **b. Do not abbreviate:**

#### **1. Similar sounding aircraft identifications.**

#### **2. Aircraft call signs, including:**

**(a) Aircraft having an International Civil Aviation Organization three letter designator (ICAO 3LD) and other aircraft with an FAA authorized call sign (U.S. special or local).**

**(b) Aircraft with a military call sign.**

#### **3. Foreign aircraft using the foreign civil registration number as identification.**

**REFERENCE–**  
*FAA Order JO 7110.65, Para 2–4–15, Emphasis for Clarity.*  
*FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.*  
*FAA Order JO 7610.12, Assignment and Authorization of Call Sign Designators and Associated Telephonies.*

Re-letter **c** through **e**

## **NEW**

### **2–4–15. EMPHASIS FOR CLARITY**

**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–**  
*FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.*  
*FAA Order JO 7110.65, Para 2–4–9, Abbreviated Transmissions.*

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

**EXAMPLE–**  
“United Thirty-one United.”  
“American Thirty-one American.”

**NOTE–**  
Similar sounding call signs procedures may apply to ICAO 3LD U.S. special, local, or military call sign.

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

**EXAMPLE–**

*“United Thirty–one United, Miami Center, U.S. Air Thirty–one is also on this frequency, acknowledge.”*

No Change

*“U.S. Air Thirty–one U.S. Air, Miami Center, United Thirty–one is also on this frequency, acknowledge.”*

**REFERENCE–**

*FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.  
FAA Order JO 7210.3, Para 2–1–14, Aircraft Identification Problems.*

Delete

**b.** Notify the operations supervisor–in–charge of any duplicate flight identification numbers or phonetically similar–sounding call signs when the aircraft are operating simultaneously within the same sector.

**d.** Notify the operations supervisor–in–charge of any duplicate call signs or phonetically similar–sounding call signs when the aircraft are operating simultaneously within the same sector.

**REFERENCE–**

*FAA Order JO 7210.3, Para 2–1–14, Aircraft Identification Problems.*

No Change

**NOTE–**

*This is especially important when this occurs on a repetitive, rather than an isolated, basis.*

Delete

**OLD****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/her initial callup except use the correct identification after communications have been established. Identify aircraft as follows:

**a.** U.S. registry aircraft. State one of the following:

**REFERENCE–**

*FAA Order JO 7110.65, Para 2–4–8, Radio Message Format.  
FAA Order JO 7110.65, Para 2–4–9, Abbreviated Transmissions.  
FAA Order JO 7110.65, Para 2–4–15, Emphasis for Clarity.  
FAA Order JO 7110.65, Para 2–4–17, Numbers Usage.*

**1.** Civil. State the prefix “November” when establishing initial communications with U.S. registered aircraft followed by the ICAO phonetic pronunciation of the numbers/letters of the aircraft registration. The controller may state the aircraft type, the model, the manufacturer’s name, followed by the ICAO phonetic pronunciation of the numbers/letters of the aircraft registration if used by the pilot on the initial or subsequent call.

**NEW****2–4–20. AIRCRAFT IDENTIFICATION**

No Change

No Change

No Change

No Change

**EXAMPLE–**

*Air traffic controller's initiated call:*

*"November One Two Three Four Golf."*

*"November One Two Three Four."*

*Responding to pilot's initial or subsequent call:*

*"Jet Commander One Two Three Four Papa."*

*"Bonanza One Two Three Four Tango."*

*"Sikorsky Six Three Eight Mike Foxtrot."*

**NOTE–**

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

**EXAMPLE–**

*"American Five Twenty–One American."*

*"Commuter Six Eleven Commuter."*

*"General Motors Thirty–Seven General Motors."*

**REFERENCE–**

*FAA Order JO 7210.3, Para 2–1–14, Aircraft Identification Problems.*

**2. Air carrier and other civil aircraft having FAA authorized call signs.** State the call sign followed by the flight number in group form.

**NOTE–**

*"Group form" is the pronunciation of a series of numbers as the whole number, or pairs of numbers they represent rather than pronouncing each separate digit. The use of group form may, however, be negated by four–digit identifiers or the placement of zeros in the identifier.*

**EXAMPLE–**

*"American Fifty–Two."*

*"Delta One Hundred."*

*"Eastern Metro One Ten."*

*"General Motors Thirty Fifteen."*

*"United One Zero One."*

*"Delta Zero One Zero."*

*"TWA Ten Zero Four."*

**NOTE–**

*Air carrier and other civil aircraft having FAA authorized call signs may be pronounced using single digits if necessary for clarity.*

**EXAMPLE–**

*"United Five One Seven."*

*"United Five Seven Zero."*

Add

No Change

**NOTE–**

*If aircraft identification becomes a problem when the procedures specified above are used, see paragraph 2–4–15, Emphasis for Clarity.*

Delete

Delete

**2. Aircraft having an ICAO 3LD and other FAA authorized call sign (U.S. special or local).** State the call sign followed by the flight number in group form.

No Change

No Change

**NOTE–**

*For clarity, aircraft having an ICAO 3LD and other FAA authorized call sign may be pronounced using single digits if necessary.*

No Change

**NOTE–**

*For procedures that address similar sounding call signs, see paragraph 2–4–15, Emphasis for Clarity.*

Add

**a3 through a11****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–**  
“Stationair F–L–R–B.”  
“C–F–L–R–B.”

**NOTE–**  
*Letters may be spoken individually or phonetically.*

Add

Add

**2. Air carrier.** The abbreviated name of the operating company followed by the letters or digits of the registration or call sign.

**EXAMPLE–**  
“Air France F–L–R–L–G.”

**3.** The flight number in group form, or you may use separate digits if that is the format used by the pilot.

**EXAMPLE–**  
“Scandinavian Sixty–eight.”  
“Scandinavian Six Eight.”

**4.** Foreign Military. Except for military services identified in FAA Order JO 7340.2, Contractions, the name of the country and the military service followed by the separate digits or letters of the registration or call sign. For military services listed in FAA Order JO 7340.2, the approved telephony followed by the separate digits of the serial number.

**EXAMPLE–**  
“Canforce Five Six Two Seven.”  
“Brazilian Air Force Five Three Two Seven Six.”

**REFERENCE–**  
**FAA Order JO 7610.12, Assignment and Authorization of Call Sign Designators and Associated Telephonies.**

No Change

No Change

**1. Civil.** State the aircraft type or the manufacturer's name followed by the letters/numbers of the **full** aircraft registration, or state the letters or digits of the **full** aircraft registration. **Do not abbreviate.**

**EXAMPLE–**  
“Citation C–G–L–R–B.”  
“C–G–L–R–B.”

**NOTE–**  
**1.** Letters may be spoken individually or phonetically.

**2. Some foreign civil aircraft registrations begin with a number.**

**REFERENCE–**  
**FAA Order JO 7110.65, Para 2–4–9, Abbreviated Transmissions.**

Delete

Delete

**2. ICAO 3LD. State the associated telephony followed by the flight number** in group form, or separate digits **may be used** if that is the format used by the pilot. **Do not abbreviate.**

No Change

**3.** Foreign Military. Except for military services identified in FAA Order JO 7340.2, Contractions, **state** the name of the country and the military service followed by the separate digits or letters of the registration or call sign. For military services listed in FAA Order JO 7340.2, **state** the approved telephony followed by the separate digits of the **flight** number.

**EXAMPLE–**  
“Canforce Five Six Two Seven.”  
“Brazilian Air Force Five Three Two Seven.”

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## **1. PARAGRAPH NUMBER AND TITLE: 2–6–4. ISSUING WEATHER AND CHAFF AREAS**

**2. BACKGROUND:** When an aircraft is taken off of a procedure that includes published speed restrictions, all published speed restrictions on the assigned procedure are cancelled. FAA Order JO 7110.65 is silent on this issue. If speed control is necessary, a speed must be assigned.

**3. CHANGE:****OLD****2–6–4. ISSUING WEATHER AND CHAFF AREAS****Title through h1 REFERENCE**

2. When approving a weather deviation for an aircraft that had previously been issued a crossing altitude, including climb via or descend via clearances, issue an altitude to maintain along with the clearance to deviate. If you intend on clearing the aircraft to resume the procedure, advise the pilot.

**PHRASEOLOGY–**

DEVIATION (restrictions, if necessary) APPROVED, MAINTAIN (altitude), (if applicable) EXPECT TO RESUME (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 the altitude 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–**

FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments.  
FAA Order JO 7110.65, Para 5–6–2, Methods.

**NEW****2–6–4. ISSUING WEATHER AND CHAFF AREAS****No Change**

2. When approving a weather deviation for an aircraft that had previously been issued a crossing altitude, including climb via or descend via clearances, issue an altitude to maintain **and, if necessary, assign a speed** along with the clearance to deviate. If you intend on clearing the aircraft to resume the procedure, advise the pilot.

**PHRASEOLOGY–**

DEVIATION (restrictions, if necessary) APPROVED, MAINTAIN (altitude), (**if necessary**) **MAINTAIN (speed)**, (if applicable) EXPECT TO RESUME (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–**

FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments.  
**FAA Order JO 7110.65, Para 5–6–1, Application.**  
FAA Order JO 7110.65, Para 5–6–2, Methods.

**1. PARAGRAPH NUMBER AND TITLE:****2–6–6. HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS)****2–9–3. CONTENT**

**2. BACKGROUND:** Hazardous Inflight Weather Advisory Service (HIWAS) is a legacy service that broadcasts hazardous weather advisories over a network of very high frequency omni-directional radio range (VOR) outlets across the continental United States (CONUS). Originally, a specialist created these broadcasts using a script. Today, the broadcast is made by a computer-based system using text to voice technology. Airborne pilots can access these recordings over select VOR outlets. Flight Information Service–Broadcast (FIS–B) replaces the current HIWAS broadcast with both a graphical and textual display of hazardous weather information right to the cockpit at lower altitudes and over a greater geographical area. For those pilots who have not yet adopted the latest technology, an advisory alert broadcast will still be made to advise these pilots that adverse weather conditions exist and to contact Flight Service for additional information if needed.

**3. CHANGE:****OLD****2-6-6. HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS)**

Controllers must advise pilots of hazardous weather that may impact operations within 150 NM of their sector or area of jurisdiction. Hazardous weather information contained in HIWAS broadcasts includes Airmen's Meteorological Information (AIRMET), Significant Meteorological Information (SIGMET), Convective SIGMET (WST), Urgent Pilot Weather Reports (UUA), and Center Weather Advisories (CWA). Facilities must review alert messages to determine the geographical area and operational impact for hazardous weather information broadcasts. The broadcast is not required if aircraft on your frequency(s) will not be affected.

**a.** Controllers within commissioned HIWAS areas must broadcast a HIWAS alert on all frequencies, except emergency frequency, upon receipt of hazardous weather information. Controllers are required to disseminate data based on the operational impact on the sector or area of control jurisdiction.

**NOTE-**

*The inclusion of the type and number of weather advisory responsible for the HIWAS advisory is optional.*

**PHRASEOLOGY-**

ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION (SIGMET, Convective SIGMET, AIRMET, Urgent Pilot Weather Report (UUA), or Center Weather Advisory (CWA), Number or Numbers) FOR (specific weather phenomenon) WITHIN (geographical area) AVAILABLE ON HIWAS, OR FLIGHT SERVICE FREQUENCIES.

**b.** Controllers outside of commissioned HIWAS areas must:

**1.** Advise pilots of the availability of hazardous weather advisories. Pilots requesting additional information should be directed to contact the nearest Flight Service.

**2.** Apply the same procedure when HIWAS outlets, or outlets with radio coverage extending into your sector or airspace under your jurisdiction, are out of service.

**NEW****2-6-6. HAZARDOUS INFLIGHT WEATHER ADVISORY**

Controllers must advise pilots of hazardous weather that may impact operations within 150 NM of their sector or area of jurisdiction. Hazardous weather information contained in the advisories includes Airmen's Meteorological Information (AIRMET), Significant Meteorological Information (SIGMET), Convective SIGMET (WST), Urgent Pilot Weather Reports (UUA), and Center Weather Advisories (CWA). Facilities must review alert messages to determine the geographical area and operational impact of hazardous weather information. Advisories are not required if aircraft on your frequency(s) will not be affected.

**a.** Controllers must broadcast a hazardous inflight weather advisory on all frequencies, except emergency frequency, upon receipt of hazardous weather information. Controllers are required to disseminate data based on the operational impact on the sector or area of control jurisdiction. Pilots requesting additional information must be directed to contact the nearest Flight Service.

**NOTE-**

*The inclusion of the type and number of weather advisory responsible for the hazardous inflight weather advisory is optional.*

**PHRASEOLOGY-**

ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION (SIGMET, Convective SIGMET, AIRMET, Urgent Pilot Weather Report (UUA), or Center Weather Advisory (CWA), Number or Numbers) FOR (specific weather phenomenon) WITHIN (geographical area), AVAILABLE ON FLIGHT SERVICE FREQUENCIES.

Delete

Delete

Delete

**PHRASEOLOGY-**

**ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION FOR (specific weather phenomenon) WITHIN (geographical area) AVAILABLE FROM FLIGHT SERVICE.**

Delete

**c and d**Re-letter **b** and **c****OLD****2-9-3. CONTENT****Title through p****EXAMPLE-**

*“Boston Tower Information Delta. One four zero zero Zulu. Wind two five zero at one zero. Visibility one zero. Ceiling four thousand five hundred broken. Temperature three four. Dew point two eight. Altimeter three zero one zero. ILS-DME Runway Two Seven Approach in use. Departing Runway Two Two Right. Hazardous Weather Information for (geographical area) available on HIWAS or Flight Service Frequencies. Advise on initial contact you have Delta.”*

**NEW****2-9-3. CONTENT****No Change****EXAMPLE-**

*“Boston Tower Information Delta. One four zero zero Zulu. Wind two five zero at one zero. Visibility one zero. Ceiling four thousand five hundred broken. Temperature three four. Dew point two eight. Altimeter three zero one zero. ILS-DME Runway Two Seven Approach in use. Departing Runway Two Two Right. Hazardous Weather Information for (geographical area) available on Flight Service Frequencies. Advise on initial contact you have Delta.”*

**1. PARAGRAPH NUMBER AND TITLE: 3-10-5. LANDING CLEARANCE**

**2. BACKGROUND:** Wrong Surface Landings (WSL) have been an ongoing issue in the National Airspace System (NAS) for several years. In 2017, WSLs became one of the Air Traffic Organization’s (ATO) Top Five (5) safety issues/hazards. Reducing wrong surface events is one of the FAA’s top priorities. During reviews of these WSL events, a trend of controller inaction has been identified, particularly when an aircraft is between a one mile final and the runway threshold. In these instances, the data showed that controllers often stated the aircraft was in a “critical phase of flight,” and they felt it was best not to issue control instructions. This inaction is unacceptable and control instructions must be issued. Mandatory Occurrence Reports also indicate that in some cases, controllers see an aircraft aligned to the wrong runway and fail to issue a landing clearance or go-around instructions.

**3. CHANGE:****OLD****3-10-5. LANDING CLEARANCE****Title through a *NOTE***

Add

Add

**NEW****3-10-5. LANDING CLEARANCE****No Change**

**b. When you become aware that an aircraft is aligned with the wrong surface, inform the pilot and:**

**1. Issue control instructions/clearances, or**

Add

**EXAMPLE–****“United four twenty three, go-around, you appear to be aligned with the wrong runway.”****“American sixty three, go-around, you appear to be aligned with a taxiway.”****“Southwest two thirty nine, you appear to be aligned with Runway 27 Left (pertinent information), Runway 27 Left, cleared to land.”**

Add

**2. If time permits, verify the pilot is aligned with the correct runway. Issue control instructions/clearances as necessary.**

Add

**EXAMPLE–****“Twin Cessna four one four lima bravo, verify you are aligned with Runway 27 Left.”**

Add

**REFERENCE–****FAA Order JO 7110.65, Para 3–6–4, Safety Logic Alert Responses.  
FAA Order JO 7110.65, Para 3–10–8, Withholding Landing Clearance.****b** through **f**Re–letter **c** through **g****1. PARAGRAPH NUMBER AND TITLE:**

5–1–3. ATC SURVEILLANCE SOURCE USE

Chapter 5, Section 2. Beacon Systems

5–2–1. ASSIGNMENT CRITERIA

5–2–13. STANDBY OR LOW SENSITIVITY OPERATION

5–2–17. FAILED TRANSPONDER IN CLASS A AIRSPACE

5–2–23. BEACON TERMINATION

5–3–2. PRIMARY RADAR IDENTIFICATION METHODS

5–3–3. BEACON IDENTIFICATION METHODS

**2. BACKGROUND:** Automatic Dependent Surveillance–Broadcast (ADS–B) is a key NextGen technology in the effort to modernize the National Airspace System (NAS). The FAA published a new regulation in 2010, 14 CFR § 91.225, which mandates that after January 1, 2020, aircraft flying in most U.S. domestic controlled airspace must be equipped with ADS–B Out. As a result, many FAA orders and documents must be updated to reflect these new requirements. Most operational procedures and phraseologies applicable to ATC transponders also apply to ADS–B Out, so the changes in this document are largely editorial in nature.

Additionally, in the course of identifying the paragraphs in FAA Order JO 7110.65 requiring changes, several obsolete terms and references were discovered.

**3. CHANGE:****OLD****5-1-3. ATC SURVEILLANCE SOURCE USE**Title through **a2(b)****PHRASEOLOGY-**

PRIMARY RADAR UNAVAILABLE (describe location). RADAR SERVICES AVAILABLE ON TRANSPONDER EQUIPPED AIRCRAFT ONLY.

**OLD****Section 2. Beacon Systems****OLD****5-2-1. ASSIGNMENT CRITERIA**Title through **a1**

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

Add

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

**PHRASEOLOGY-**

SQUAWK THREE/ALFA (code),

or

SQUAWK (code).

**NOTE-**

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

**REFERENCE-**

FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.

**NEW****5-1-3. ATC SURVEILLANCE SOURCE USE**

No Change

**PHRASEOLOGY-**

PRIMARY RADAR UNAVAILABLE (describe location). RADAR SERVICES AVAILABLE ON TRANSPONDER OR ADS-B EQUIPPED AIRCRAFT ONLY.

**NEW****Section 2. Beacon/ADS-B Systems****NEW****5-2-1. ASSIGNMENT CRITERIA**

No Change

2. Make beacon code assignments to only ADS-B and/or transponder-equipped aircraft.

**NOTE-**

Aircraft equipped with ADS-B are also still required to have an operable transponder. The ATC-assigned code is one of the required message elements of ADS-B Out.

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

No Change

No Change

No Change

**OLD****5-2-13. STANDBY OR LOW SENSITIVITY OPERATION**

You may instruct an aircraft operating on an assigned code to change transponder to “standby” or “low sensitivity” position:

**NOTE-**

*National standards no longer require improved transponder to be equipped with the low sensitivity feature. Therefore, aircraft with late model transponders will be unable to respond to a request to “squawk low.”*

a. When approximately 15 miles from its destination and you no longer desire 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 sensitivity” position as soon as possible thereafter.

**PHRASEOLOGY-**  
**SQUAWK STANDBY,**

*or*

**SQUAWK LOW/NORMAL.**

**REFERENCE-**  
FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.

**OLD****5-2-17. FAILED TRANSPONDER IN CLASS A AIRSPACE**

Disapprove a request or withdraw previously issued approval to operate in Class A airspace with a failed transponder solely on the basis of traffic conditions or other operational factors.

**REFERENCE-**  
FAA Order JO 7110.65, Para 5-1-3, Radar Use.  
FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.

**OLD****5-2-23. BEACON TERMINATION**

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

**NEW****5-2-13. STANDBY OPERATION**

You may instruct an aircraft operating on an assigned code to change the transponder/ADS-B to “standby” position:

Delete

a. When approximately 15 miles from its destination and you no longer desire operation of the transponder/ADS-B; or

b. When necessary to reduce clutter in a multi-target area, provided you instruct the **pilot** to return **the transponder/ADS-B** to “normal” position as soon as possible thereafter.

**PHRASEOLOGY-**  
**SQUAWK STANDBY,**

*or*

**SQUAWK NORMAL.**

**REFERENCE-**  
FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.

**NEW****5-2-17. FAILED TRANSPONDER OR ADS-B OUT TRANSMITTER**

Disapprove a request or withdraw **a** previously issued approval to operate with a failed transponder **or ADS-B Out** solely on the basis of traffic conditions or other operational factors.

**REFERENCE-**  
FAA Order JO 7110.65, Para 5-1-3, Radar Use.  
FAA Order JO 7110.65, Para 5-3-3, Beacon Identification Methods.

**NEW****5-2-23. BEACON TERMINATION**

Inform **the pilot** when you want **their aircraft’s** transponder **and ADS-B Out turned off**.

**PHRASEOLOGY–  
STOP SQUAWK.**

No Change

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

STOP SQUAWK (mode in use).

**REFERENCE–**  
FAA Order JO 7110.65, Para 5 –3 –3, Beacon Identification Methods.

**REFERENCE–**  
FAA Order JO 7110.65, Para 5 –3 –3, Beacon Identification Methods.

**OLD****5–3–2. PRIMARY RADAR  
IDENTIFICATION METHODS**

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

**NEW****5–3–2. PRIMARY RADAR  
IDENTIFICATION METHODS**

Identify a primary, radar beacon, or ADS-B target by using one of the following methods:

**OLD****5–3–3. BEACON IDENTIFICATION  
METHODS**

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

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

**NOTE–**

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

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

**PHRASEOLOGY–**  
**IDENT.**  
**SQUAWK (code) AND IDENT.**

**b.** Request the aircraft to change to a specific discrete or nondiscrete code, as appropriate, and then observe the target or code display change. If a code change is required in accordance with Section 2, Beacon Systems, of this chapter, use the codes specified therein.

**NEW****5–3–3. BEACON/ADS-B IDENTIFICATION  
METHODS**

When using only Mode 3/A radar beacon or ADS-B to identify a target, use one of the following methods:

**a.** Request the pilot to activate the “IDENT” feature of the transponder/ADS-B and then observe the identification display.

Delete

Delete

No Change

**b.** Request the pilot to change to a specific discrete or nondiscrete code, as appropriate, and then observe the target or code display change. If a code change is required in accordance with Section 2, Beacon/ADS-B Systems, of this chapter, use the codes specified therein.

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

**PHRASEOLOGY–**  
**SQUAWK STANDBY,**

*then*

**SQUAWK NORMAL.**

d. **EN ROUTE.** An aircraft may be considered identified when the full data block is automatically associated with the beacon target symbol of an aircraft that is squawking a discrete code assigned by the computer.

**NOTE–**

*Paired LDBs in ERAM do not display a beacon code.*

**PHRASEOLOGY–**

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

**NOTE–**

*The AIM informs pilots to adjust Mode C transponders with altitude reporting capability activated unless deactivation is requested by ATC. Squawk altitude is included to provide applicable phraseology.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–1–9, Use of Tower Radar Displays.  
FAA Order JO 7110.65, Para 5–3–6, Position Information.*

c. Request the pilot to change their transponder/**ADS-B** to “standby.” After you observe the target disappear for sufficient scans to assure that loss of target resulted from placing the transponder/**ADS-B** in “standby” position, request the pilot to return the transponder to normal operation and then observe the reappearance of the target.

No Change

d. **EN ROUTE.** An aircraft may be considered identified when the full data block is automatically associated with the target symbol of an aircraft that is squawking a discrete code assigned by the computer.

No Change

No Change

**NOTE–**

*The AIM informs pilots to adjust Mode C transponders and ADS-B with altitude reporting capability activated unless deactivation is requested by ATC. “Squawk altitude” is included here to provide applicable phraseology.*

No Change

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**1. PARAGRAPH NUMBER AND TITLE:**

5–2–25. INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER

5–2–26. ADS-B ALERTS

5–2–27. ADS-B OUT OFF OPERATIONS

**2. BACKGROUND:** As originally enacted, 14 CFR § 91.225(f) stated, “Each person operating an aircraft equipped with ADS-B Out must operate this equipment in the transmit mode at all times.” This was amended in July 2019 by adding, “unless— (1) Otherwise authorized by the FAA when that aircraft is performing a sensitive government mission for national defense, homeland security, intelligence or law enforcement purposes, and transmitting would compromise the operations security of the mission or pose a safety risk to the aircraft, crew, or people and property in the air or on the ground; or (2) Otherwise directed by ATC when transmitting would jeopardize the safe execution of air traffic control functions.” The conditions for either allowing or directing an aircraft to operate without transmitting Automatic Dependent Surveillance–Broadcast (ADS-B) Out are thus very narrow. For the new provision (1), FAA System Operations Security will be solely responsible for approving those authorizations. For provision (2), this change allows controllers to direct aircraft to stop ADS-B

transmissions under the same circumstances they do now with transponders, such as malfunctioning avionics or non-lead aircraft participating in a formation flight.

Each aircraft or ground vehicle equipped with ADS-B is expected to transmit a unique 24-bit ICAO address. ATC automation systems alert controllers when a duplicate ICAO address occurs within the same ADS-B service volume. Such events are rare, and field observations have found that controllers are often unable to identify the second aircraft or vehicle. Recent changes to the ADS-B Performance Monitor (APM), which records every ADS-B transmission for quality analysis purposes, will allow for the automatic collection of Duplicate ICAO address events. Controller and facility reporting of Duplicate ICAO Addresses is therefore no longer required.

### 3. CHANGE:

#### OLD

##### **5-2-25. INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER**

Inform an aircraft when the ADS-B transmitter appears to be inoperative or malfunctioning. Notify the OS/CIC of the aircraft call sign and location of aircraft.

##### ***PHRASEOLOGY-***

*(Aircraft ID) YOUR ADS-B TRANSMITTER APPEARS TO BE INOPERATIVE / MALFUNCTIONING.*

Add

Add

Add

#### OLD

##### **5-2-26. ADS-B ALERTS**

a. Call Sign Mis-Match (CSMM). A CSMM alert will occur when the ADS-B broadcast call sign does not match the flight plan call sign.

##### ***PHRASEOLOGY-***

*(Aircraft ID) YOUR ADS-B CALL SIGN DOES NOT MATCH YOUR FLIGHT PLAN CALL SIGN.*

#### NEW

##### **5-2-25. INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER**

**a. Except as provided in Paragraph 5-2-27, inform an aircraft when the ADS-B transmitter appears to be inoperative or malfunctioning. Notify the OS/CIC of the aircraft call sign and location of aircraft.**

##### ***PHRASEOLOGY-***

*YOUR ADS-B TRANSMITTER APPEARS TO BE INOPERATIVE / MALFUNCTIONING.*

**b. If a malfunctioning ADS-B transmitter is jeopardizing the safe execution of air traffic control functions, instruct the aircraft to stop ADS-B transmissions, and notify the OS/CIC.**

##### ***PHRASEOLOGY-***

*STOP ADS-B TRANSMISSIONS, AND IF ABLE, SQUAWK THREE/ALFA (code).*

##### ***NOTE-***

*Not all aircraft have a capability to disengage the ADS-B transmitter independently from the beacon code squawk.*

#### NEW

##### **5-2-26. ADS-B ALERTS**

a. Call Sign Mis-Match (CSMM). A CSMM alert will occur when the **transmitted ADS-B Flight Identification (FLT ID)** does not match the flight plan **aircraft identification. Inform the aircraft of the CSMM.**

##### ***PHRASEOLOGY-***

*YOUR ADS-B FLIGHT ID DOES NOT MATCH YOUR FLIGHT PLAN AIRCRAFT IDENTIFICATION.*

**b. Duplicate ICAO Address.** If the broadcast ICAO address is shared with one or more flights in the same ADS-B Service Area (regardless of altitude), and radar reinforcement is not available, target resolution may be lost on one or both targets. Notify the OS/CIC of the aircraft call sign and location of aircraft.

**NOTE–**

1. If this occurs controllers should ensure targets remain radar reinforced or at least 6 NMs apart.

2. Duplicate ICAO Address Alerts appear as “DA” and are associated with the Data Block (DB) on STARS and CARTS systems. Duplicate ICAO Address Alerts appear as “DUP” and are associated with the DB on MEARTS systems. Duplicate ICAO Address Alerts appear as “Duplicate 24-bit Address” on ERAM systems.

Add

Add

Add

**OLD**

Add

Add

Add

Add

**b. Duplicate ICAO Address.** If the broadcast ICAO address is shared with one or more flights in the same ADS-B Service Area (regardless of altitude), and radar reinforcement is not available, target resolution may be lost on one or both targets.

**NOTE–**

*Duplicate ICAO Address Alerts appear as “DA” and are associated with the Data Block (DB) on STARS systems. Duplicate ICAO Address Alerts appear as “DUP” and are associated with the DB on MEARTS systems. Duplicate ICAO Address Alerts appear as “Duplicate 24-bit Address” **at the AT Specialist Workstation** on ERAM systems.*

**c. If a CSMM or Duplicate ICAO address is jeopardizing the safe execution of air traffic control functions, instruct the aircraft to stop ADS-B transmissions, and notify the OS/CIC.**

**PHRASEOLOGY–**

**STOP ADS-B TRANSMISSIONS, AND IF ABLE, SQUAWK THREE/ALFA (code).**

**NOTE–**

**Not all aircraft are capable of disengaging the ADS-B transmitter independently from the transponder.**

**NEW**

**5-2-27. ADS-B OUT OFF OPERATIONS**

**Operators of aircraft with functional ADS-B Out avionics installed and requesting an exception from the requirement to transmit at all times must obtain authorization from FAA System Operations Security. The OS/CIC should inform you of any ADS-B Out OFF operations in your area of jurisdiction.**

**a. Do not inform such aircraft that their ADS-B transmitter appears to be inoperative.**

**b. Do not approve any pilot request for ADS-B Out OFF operations. Notify the OS/CIC of the request, including the aircraft call sign and location.**

Add

**NOTE–**

**14 CFR Section 91.225(f) requires, in part, that “each person operating an aircraft equipped with ADS–B Out must operate this equipment in the transmit mode at all times unless otherwise authorized by the FAA when that aircraft is performing a sensitive government mission for national defense, homeland security, intelligence or law enforcement purposes, and transmitting would compromise the operations security of the mission or pose a safety risk to the aircraft, crew, or people and property in the air or on the ground.”**

Add

**REFERENCE–**

**FAA Order JO 7110.65, Para 5–2–25, Inoperative or Malfunctioning ADS–B Transmitter.**  
**FAA Order JO 7210.3, Para 5–4–9, ADS–B Out OFF Operations.**  
**FAA Order JO 7110.67, Para 11, Responsibilities.**

**1. PARAGRAPH NUMBER AND TITLE: 5–5–4. MINIMA**

**2. BACKGROUND:** The ATO continued its migration to the STARS platform in 2015 when the use of FUSION targets was incorporated into FAA Order JO 7110.65. The migration was authorized by NOTICE 7110.683, Guidance for the Implementation of FUSION/Automatic Dependent Surveillance–Broadcast (ADS–B) within Common Automated Terminal System Model IIIIE (CARTS) and Standard Automation Replacement System (STARS).

Many paragraphs were affected by this migration. The subparagraph that is the subject of this Document Change Proposal (DCP) was overlooked.

**3. CHANGE:****OLD****5–5–4. MINIMA**

Title through i

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

**NEW****5–5–4. MINIMA**

No Change

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

**1. PARAGRAPH NUMBER AND TITLE: 5–6–2. METHODS**

**2. BACKGROUND:** When an aircraft is taken off of a procedure that includes published speed restrictions, all published speed restrictions on the assigned procedure are canceled. FAA Order JO 7110.65 is silent on this issue. If speed control is necessary, a speed must be assigned.

**3. CHANGE:****OLD****5-6-2. METHODS****Title through b NOTE**

c. When vectoring or approving course deviations, assign an altitude to maintain when:

1. The vector or approved deviation is off an assigned procedure which contains altitude instructions, i.e., instrument approach, etc.

**c2 and c2 REFERENCE**

3. The vector or approved deviation is off an assigned procedure that contains published altitude restrictions, i.e., SID, STAR, and a clearance to Climb Via/Descend Via has been issued.

d. When vectoring or approving an aircraft to deviate off of a procedure that includes published altitude restrictions, advise the pilot if you intend on clearing the aircraft to resume the procedure.

**PHRASEOLOGY-**

FLY HEADING (degrees), MAINTAIN (altitude), EXPECT TO RESUME (SID, STAR, etc.).

DEVIATION (restrictions if necessary) APPROVED, MAINTAIN (altitude) EXPECT TO RESUME (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 the altitude 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's published top or bottom altitude.

**NEW****5-6-2. METHODS****No Change**

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.

**No Change**

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.

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 (altitude), **(if necessary, MAINTAIN (speed))**, EXPECT TO RESUME (SID, STAR, etc.).

DEVIATION (restrictions if necessary) APPROVED, MAINTAIN (altitude), **(if necessary, MAINTAIN (speed))**, EXPECT TO RESUME (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.

**1. PARAGRAPH NUMBER AND TITLE: 5-7-1. APPLICATION**

**2. BACKGROUND:** When an aircraft is vectored or deviates off of a procedure that includes published speed restrictions, all published speed restrictions on the assigned procedure are canceled. FAA Order JO 7110.65 is silent on this issue. If speed control is necessary, a speed must be assigned. If the controller's intention is for the aircraft to resume the published speed(s) at some point further along on the procedure, pilots should be informed so that they do not unnecessarily delete speeds from the flight management system.

**3. CHANGE:**

<u>OLD</u>	<u>NEW</u>
<b>5-7-1. APPLICATIONS</b>	<b>5-7-1. APPLICATIONS</b>
Title through <b>d</b> <i>NOTE</i>	No Change
Add	<p><b><u>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.</u></b></p> <p><b><u>NOTE-</u></b>  <b><u>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.</u></b></p>
Add	
<p><b><u>e. If feasible, when issuing speed adjustments to aircraft cleared along a route or procedure that has published speed restrictions, advise <u>aircraft</u> where to resume published speed.</u></b></p>	<p><b><u>f. When issuing speed adjustments to aircraft cleared along a route or procedure that has published speed restrictions, <u>if feasible</u>, advise <u>the pilot</u> where <u>you intend on allowing the aircraft</u> to resume <u>the</u> published speed.</u></b></p> <p><b><u>NOTE-</u></b>  <b><u>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.</u></b></p>
Add	
<p><b><u>f. Express speed adjustments in terms of knots based on indicated airspeed (IAS) in 5-knot increments. At or above FL 240, speeds may be expressed in terms of Mach numbers in 0.01 increments for turbojet aircraft with Mach meters (i.e., Mach 0.69, 0.70, 0.71, etc.).</u></b></p> <p><b><u>NOTE-</u></b></p> <p><b><u>1. Pilots complying with speed adjustment instructions (published or assigned) should maintain a speed within plus or minus 10 knots or 0.02 Mach number of the specified speed.</u></b></p> <p><b><u>2. When assigning speeds to achieve spacing between aircraft at different altitudes, consider that ground speed may vary with altitude. Further speed adjustment may be necessary to attain the desired spacing.</u></b></p>	<p><b><u>g. Express speed adjustments in terms of knots based on indicated airspeed (IAS) in 5-knot increments. At or above FL 240, speeds may be expressed in terms of Mach numbers in 0.01 increments for turbojet aircraft with Mach meters (i.e., Mach 0.69, 0.70, 0.71, etc.).</u></b></p>
	No Change
	No Change

3. *Controllers should anticipate pilots will begin adjusting speed at the minimum distance necessary prior to a published speed restriction so as to cross the waypoint/fix at the published speed. Once at the published speed, controllers should expect pilots will maintain the published speed until additional adjustment is required to comply with further published restrictions or ATC assigned speed restrictions.*

No Change

**REFERENCE–**  
FAA Order JO 7110.65, Para 5–7–2, Methods.

**REFERENCE–**  
**FAA Order JO 7110.65, Para 5–6–1, Application.**  
FAA Order JO 7110.65, Para 5–7–2, Methods.

# **1. PARAGRAPH NUMBER AND TITLE: 5–8–3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES**

**2. BACKGROUND:** Equivalent Lateral Spacing Operations (ELSO) was incorporated into JO 7110.65 in June 2015. ELSO operations allow for a reduced course divergence value when simultaneous or successive departures are both flying Area Navigation (RNAV) departures. This differs from the legacy procedure which required 15 degrees of divergence at all times. The MITRE ELSO analysis and the ELSO SRMD assumed that positive course guidance commencing immediately after departure assures divergence. There is ambiguity in the current provisions of the subject paragraph between legacy operations and the new ELSO procedures.

## **3. CHANGE:**

### **OLD**

#### **5–8–3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES**

##### ***TERMINAL***

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

##### **NOTE–**

1. FAA Order 8260.46, *Departure Procedure (DP) Program*, and FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)*, Volume 4, establishes guidelines for IFR departure turning procedures which assumes a climb to 400 feet above the departure end of runway (DER) elevation before a turn is commenced. TERPS criteria ensures obstacle clearance with a climb gradient of 200 feet per nautical mile from the DER. “Immediately after departure” is considered to be any turn that provides at least 15 degrees of divergence that commences no later than 2 miles from the DER.

2. Consider known aircraft performance characteristics when applying initial separation to successive departing aircraft.

### **NEW**

#### **5–8–3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES**

No Change

Separate aircraft departing from the same airport/heliport or adjacent airports/heliports in accordance with the following minima provided radar identification with the aircraft will be established within 1 mile of the takeoff runway end/helipad and courses will diverge by **at least the minimum required, as stated below**.

##### **NOTE–**

1. FAA Order 8260.46, *Departure Procedure (DP) Program*, and FAA Order 8260.3, *United States Standard for Terminal Instrument Procedures (TERPS)*, Volume 4, establishes guidelines for IFR departure turning procedures which assumes a climb to 400 feet above the departure end of runway (DER) elevation before a turn is commenced. TERPS criteria ensures obstacle clearance with a climb gradient of 200 feet per nautical mile from the DER. “Immediately after departure” is considered to be any turn that provides at least **the minimum required** divergence that commences no later than 2 miles from the DER.

No Change

3. When one or both of the departure surfaces is a helipad, use the takeoff course of the helicopter as a reference, comparable to the centerline of a runway and the helipad center as the threshold.

No Change

a. Between aircraft departing the same runway/helipad or parallel runways/helicopter takeoff courses separated by less than 2,500 feet—1 mile if courses diverge by 15 degrees or more immediately after departure or 10 degrees or more when both aircraft are departing the same runway and both are flying an RNAV SID. (See FIG 5-8-1, FIG 5-8-2, and FIG 5-8-3.)

a. Between **successive departures from** the same runway/helipad or parallel runways/helicopter takeoff courses separated by less than 2,500 feet—1 mile if courses diverge by 15 degrees or more immediately after departure. (See FIG 5-8-1, FIG 5-8-2, and FIG 5-8-3.)

**NOTE—**

RNAV SIDs specific to this paragraph are those SIDs constructed with a specific lateral path that begins at the DER.

Delete

FIG 5-8-1 through FIG 5-8-3 REFERENCE

No Change

b. Between aircraft departing from diverging runways:

**b. Between simultaneous departures departing in the same direction from parallel runways/helicopter takeoff courses, authorize simultaneous takeoffs if the centerlines/takeoff courses are separated by at least 2,500 feet and courses diverge by 15 degrees or more immediately after departure. (See FIG 5-8-4, and FIG 5-8-5.)**

Add

**1. Nonintersecting runways. Authorize simultaneous takeoffs if runways diverge by 15 degrees or more. (See FIG 5-8-4.)**

**REFERENCE—**

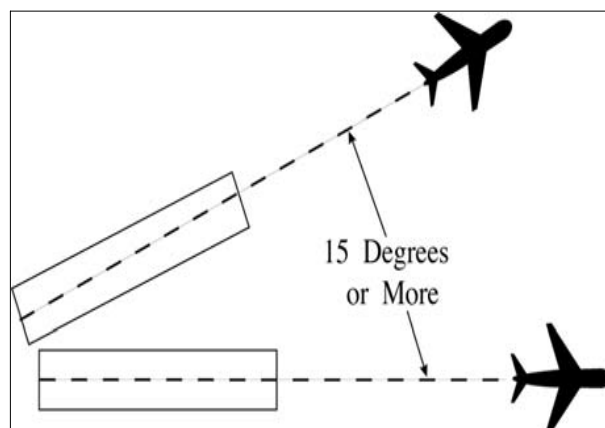
FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.

Delete

Delete

FIG 5-8-4

**Nonintersecting Runway Departures**

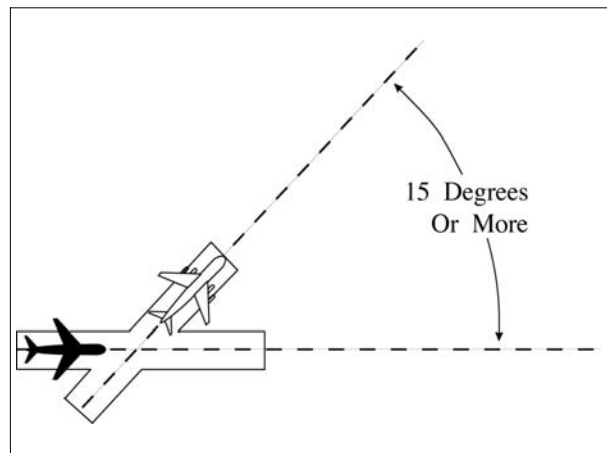


**2. Intersecting runways and/or helicopter takeoff courses which diverge by 15 degrees or more. Authorize takeoff of a succeeding aircraft when the preceding aircraft has passed the point of runway and/or takeoff course intersection. When applicable, apply the procedure in Paragraph 3-9-5, Anticipating Separation. (See FIG 5-8-5 and FIG 5-8-6.)**

Delete

Delete

FIG 5-8-5

**Intersecting Runway Departures****NOTE-**

*This procedure does not apply when wake turbulence separation is required.*

Delete

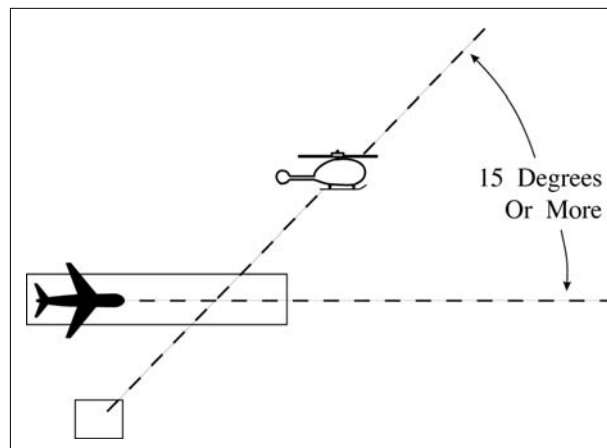
**REFERENCE-**

*FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.*

Delete

Delete

FIG 5-8-6

**Intersecting Helicopter Course Departures**

c. Between aircraft departing in the same direction from parallel runways/helicopter takeoff courses. Authorize simultaneous takeoffs if the centerlines/takeoff courses are separated by at least 2,500 feet and courses diverge by 15 degrees or more immediately after departure or 10 degrees or more when both aircraft are flying an RNAV SID. (See FIG 5-8-7 and FIG 5-8-8.)

**NOTE-**

RNAV SIDs specific to this paragraph are those SIDs constructed with a specific lateral path that begins at the DER.

Delete

Add

**1. Between successive departures from the same runway- 1 mile if courses diverge by 10 degrees or more immediately after departure.** (See FIG 5-8-1.)

Add

**NOTE-**

This procedure does not apply when wake turbulence separation is required.

Add

**2. Between simultaneous departures from parallel runways/helicopter takeoff courses, authorize simultaneous takeoffs if the centerlines/takeoff courses are separated by at least 2,500 feet and courses diverge by 10 degrees or more immediately after departure.** (See FIG 5-8-4, and FIG 5-8-5.)

Add

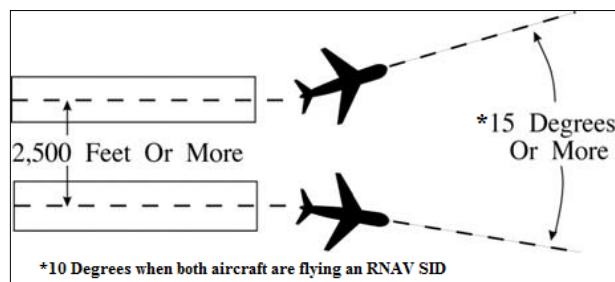
**NOTE-**

RNAV SIDs specific to this paragraph are those SIDs constructed with a specific lateral path that begins at the DER.

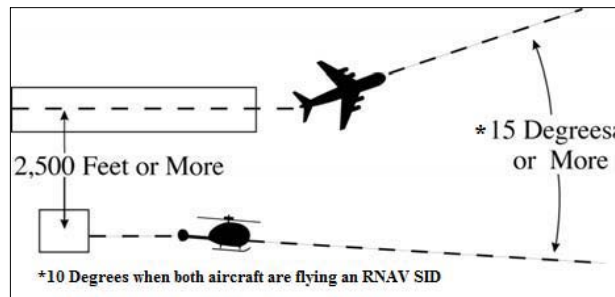
Add

**FIG 5-8-4**

**Parallel Runway Departures**



Add

*FIG 5-8-5***Parallel Helicopter Course Departures**

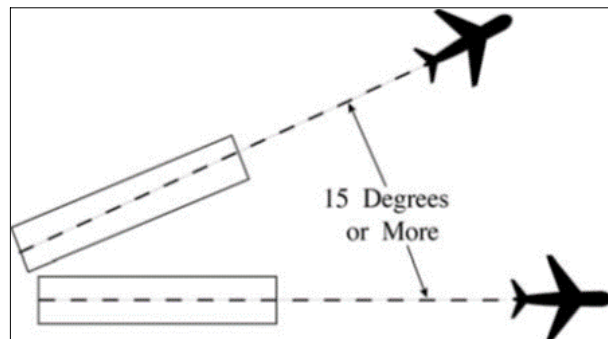
Add

**d. Between aircraft departing from diverging runways:**

Add

**1. Nonintersecting runways. Authorize simultaneous takeoffs if runways diverge by 15 degrees or more. (See FIG 5-8-6.)**

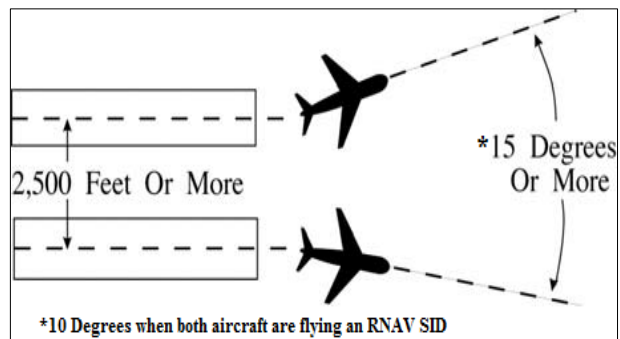
Add

*FIG 5-8-6***Nonintersecting Runway Departures**

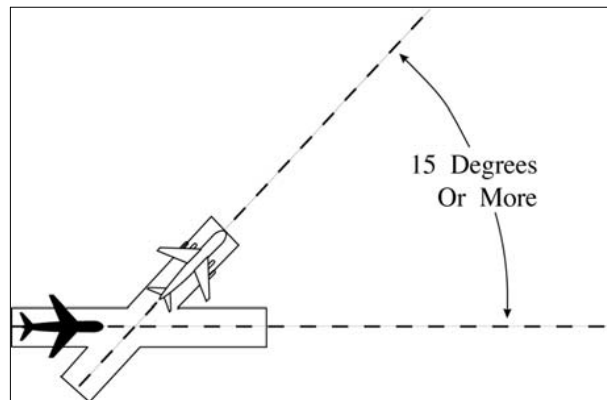
Add

**2. Intersecting runways and/or helicopter takeoff courses which diverge by 15 degrees or more. Authorize takeoff of a succeeding aircraft when the preceding aircraft has passed the point of runway and/or takeoff course intersection. When applicable, apply the procedure in Paragraph 3-9-5, Anticipating Separation. (See FIG 5-8-7 and FIG 5-8-8.)**

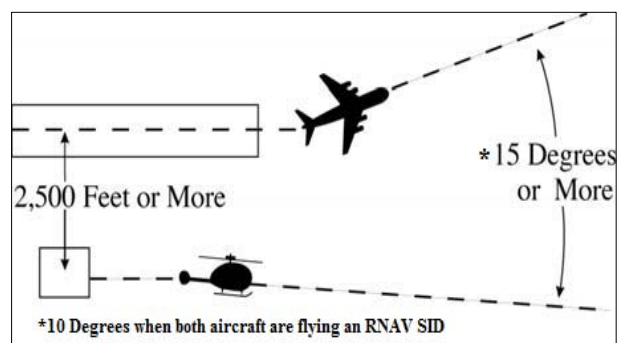
Delete

*FIG 5-8-7***Parallel Runway Departures**

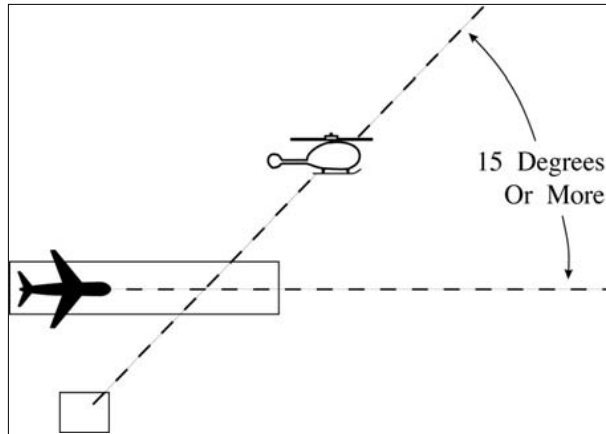
Add

*FIG 5-8-7***Intersecting Runway Departures**

Delete

*FIG 5-8-8***Parallel Helicopter Course Departures**

Add

*FIG 5-8-8***Intersecting Helicopter Course Departures**

Add

**NOTE-**

**This procedure does not apply when wake turbulence separation is required.**

Add

**REFERENCE-**

**FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.**

**1. PARAGRAPH NUMBER AND TITLE:**

5-9-9. SIMULTANEOUS OFFSET INSTRUMENT APPROACHES (SOIA)- HIGH UPDATE RADAR

**2. BACKGROUND:** The Flight Standards Service (AFS) completed a safety study DOT-FAA-AFS-400-84 in July 2014 titled Separation Requirements for Simultaneous Offset Independent Dual Instrument Approaches – High Update Rate Surveillance Not Required. The primary purpose of the study was to assess collision risk using an ASR-9 in lieu of high update rate surveillance for Simultaneous Independent Dual Instrument Approaches to runways with centerline spacing of 3000 feet or greater. Additionally, AFS evaluated the unique offset approach called Simultaneous Offset Instrument Approaches (SOIA) at San Francisco (SFO) where the runways are separated by 750 feet. AFS concluded that since the SOIA operations terminates with a visual segment from the point where the approaches reach the 3000 foot point between the two approach courses to the runway thresholds, that this study can be used to alleviate the high update rate surveillance requirements for SOIA operations. Historically, the PRM terminology has been synonymous with a type of high update radar system. In 2014, AFS removed the requirement for a high update rate surveillance system from the required facets of PRM.

**3. CHANGE:****OLD**

**5-9-9. SIMULTANEOUS OFFSET  
INSTRUMENT APPROACHES (SOIA)-  
HIGH RADAR UPDATE**

***TERMINAL***

**NEW**

**5-9-9. SIMULTANEOUS OFFSET  
INSTRUMENT APPROACHES (SOIA)**

No Change

a. Simultaneous offset instrument approaches (SOIA) may be conducted at FAA designated airports that have an authorization issued by the Director, Operations–Headquarters, AJT–2, in coordination with AFS with parallel runways that have centerlines separated by less than 3,000 feet with one final approach course offset by 2.5 to 3.0 degrees using a high update rate surveillance system with a 1.0–second radar update; and

**a1 through c6**

d. Advise the pilot of the trailing offset aircraft of traffic on the adjacent lead straight-in approach course, if that traffic will be a factor in the visual segment of the approach. The provisions of Paragraph 7–2–1, Visual Separation, subparagraph a2, concerning visual separation between aircraft being provided by the tower must not be applied to aircraft conducting SOIAs.

**NOTE–**

*Once advised, the pilot is authorized to continue past the offset approach MAP if all of the following conditions are met: The pilot has the straight-in approach traffic in sight and expects the traffic to remain in sight; the pilot advises ATC that the traffic is in sight; and the pilot has the runway environment in sight. Otherwise, it is the pilot's responsibility to execute a missed approach at the offset approach MAP.*

a. Simultaneous offset instrument approaches (SOIA) may be conducted at FAA designated airports that have an authorization issued by the Director, Operations–Headquarters, AJT–2, in coordination with AFS with parallel runways that have centerlines separated by **at least 750 feet and** less than 3,000 feet with one final approach course offset by 2.5 to 3.0 degrees; and

**No Change**

d. Advise the pilot of the trailing offset aircraft of traffic on the adjacent lead straight-in approach course, if that traffic will be a factor in the visual segment of the approach. The provisions of Paragraph 7–2–1, Visual Separation, subparagraph a1, concerning visual separation between aircraft being provided by the tower must not be applied to aircraft conducting SOIAs.

**No Change**

---

**1. PARAGRAPH NUMBER AND TITLE:**

8–7–3. LONGITUDINAL SEPARATION

8–7–4. LATERAL SEPARATION

8–8–3. LONGITUDINAL SEPARATION

8–8–4. LATERAL SEPARATION

8–9–3. LONGITUDINAL SEPARATION

8–9–4. LATERAL SEPARATION

8–10–3. LONGITUDINAL SEPARATION

8–10–4. LATERAL SEPARATION

**2. BACKGROUND:** The FAA implemented Performance Based Communication and Surveillance (PBCS) requirements and monitoring on March 29, 2018 to fulfill international agreements and comply with International Civil Aviation Organization Annex 6, Annex 11, and Document 4444. PBCS requires aircraft to have communication (data communication) and surveillance (Automatic Dependent Surveillance –Contract [ADS–C]) equipment that is certified to meet performance requirements (Required Communication Performance [RCP] and Required Surveillance Performance [RSP]) in order to be eligible for performance-based separation minima, including 30 NM and 50 NM longitudinal separation and 30 NM lateral separation. PBCS also obliges an Air Navigation Service Provider that wishes to apply performance-based separation minima to meet the applicable set of requirements for RCP240 and RSP180. In order to affirm that performance-based separation minima are being applied in FAA airspace in accordance with RCP240 and RSP180, the PBCS communication and surveillance requirements are being added to the lateral and longitudinal separation paragraphs in FAA Order JO 7110.65.

**3. CHANGE:****OLD****8-7-3. LONGITUDINAL SEPARATION**

Title through e1(b)

**NEW****8-7-3. LONGITUDINAL SEPARATION**

No Change

**OLD***TBL 8-7-1***ADS-C Criteria**

<u>Minima</u>	RNP	Maximum ADS-C Periodic Reporting Interval
50 NM	10	27 minutes
50 NM	4	32 minutes
30 NM	4	10 minutes

**NEW***TBL 8-7-1***ADS-C Criteria**

<u>Minima</u>				
<u>Standard</u>	RNP	<u>RCP</u> <u>See</u> <u>Note</u> <u>1</u>	<u>RSP</u> <u>See</u> <u>Note</u> <u>2</u>	Maximum ADS-C Periodic Reporting Interval
50 NM	10	<b>240</b>	<b>180</b>	27 minutes
50 NM	4	<b>240</b>	<b>180</b>	32 minutes
30 NM	4	<b>240</b>	<b>180</b>	10 minutes

Add

**NOTE-****1. Required Communication Performance (RCP).**

Add

**2. Required Surveillance Performance (RSP).****OLD****8-7-4. LATERAL SEPARATION**

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 4, Lateral Separation, apply the following:

a. 30 NM to RNP-4 approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**NEW****8-7-4. LATERAL SEPARATION**

No Change

a. 30 NM to **(at a minimum, RNP-4, RCP 240, and RSP 180)** approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**OLD****8-8-3. LONGITUDINAL SEPARATION**Title through **f1(b)****NEW****8-8-3. LONGITUDINAL SEPARATION**

No Change

**OLD***TBL 8-8-1***ADS-C Criteria**

<u>Minima</u>	RNP	Maximum ADS-C Periodic Reporting Interval
50 NM	10	27 minutes
50 NM	4	32 minutes
30 NM	4	10 minutes

**NEW***TBL 8-8-1***ADS-C Criteria**

<u>Minima</u>				
<u>Standard</u>	RNP	<u>RCP</u>	<u>RSP</u>	Maximum ADS-C Periodic Reporting Interval
50 NM	10	<b><u>240</u></b>	<b><u>180</u></b>	27 minutes
50 NM	4	<b><u>240</u></b>	<b><u>180</u></b>	32 minutes
30 NM	4	<b><u>240</u></b>	<b><u>180</u></b>	10 minutes

**OLD****8-8-4. LATERAL SEPARATION**

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 4, Lateral Separation, apply the following:

**a.** 30 NM to RNP-4 approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**NEW****8-8-4. LATERAL SEPARATION**

No Change

**a.** 30 NM to **(at a minimum, RNP-4, RCP 240, and RSP 180)** approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**OLD****8-9-3. LONGITUDINAL SEPARATION**Title through **c1(b)****NEW****8-9-3. LONGITUDINAL SEPARATION**

No Change

**OLD***TBL 8-9-1***ADS-C Criteria**

<b><u>Minima</u></b>	<b>RNP</b>	<b>Maximum ADS-C Periodic Reporting Interval</b>
50 NM	10	27 minutes
50 NM	4	32 minutes
30 NM	4	14 minutes

**NEW***TBL 8-9-1***ADS-C Criteria**

<b><u>Minima</u></b>				
<b><u>Standard</u></b>	<b>RNP</b>	<b><u>RCP</u></b>	<b><u>RSP</u></b>	<b>Maximum ADS-C Periodic Reporting Interval</b>
50 NM	10	<del>240</del>	<del>180</del>	27 minutes
50 NM	4	<del>240</del>	<del>180</del>	32 minutes
30 NM	4	<del>240</del>	<del>180</del>	10 minutes

**OLD****8-9-4. LATERAL SEPARATION****Title through a**

b. Apply *30 NM* to RNP-4 approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**NEW****8-9-4. LATERAL SEPARATION****No Change**

b. Apply *30 NM* to **(at a minimum, RNP-4, RCP 240, and RSP 180)** approved aircraft operating within airspace designated for RNP-4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

**OLD****8-10-3. LONGITUDINAL SEPARATION****Title through c1(b)****NEW****8-10-3. LONGITUDINAL SEPARATION****No Change**

**OLD***TBL 8-10-1***ADS-C Criteria**

<b><u>Minima</u></b>	<b>RNP</b>	<b>Maximum ADS-C Periodic Reporting Interval</b>
50 NM	10	27 minutes
50 NM	4	32 minutes
30 NM	4	10 minutes

**NEW***TBL 8-10-1***ADS-C Criteria**

<b><u>Minima</u></b>				
<b><u>Standard</u></b>	<b>RNP</b>	<b><u>RCP</u></b>	<b><u>RSP</u></b>	<b>Maximum ADS-C Periodic Reporting Interval</b>
50 NM	10	<b><u>240</u></b>	<b><u>180</u></b>	27 minutes
50 NM	4	<b><u>240</u></b>	<b><u>180</u></b>	32 minutes
30 NM	4	<b><u>240</u></b>	<b><u>180</u></b>	10 minutes

**OLD****8-10-4. LATERAL SEPARATION****Title through a**

b. 30 NM to RNP-4 approved aircraft operating within the Anchorage Oceanic CTA and Anchorage Continental CTA when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (for example, ATOP).

**NEW****8-10-4. LATERAL SEPARATION****No Change**

b. 30 NM to **(at a minimum, RNP-4, RCP 240, and RSP 180)** approved aircraft operating within the Anchorage Oceanic CTA and Anchorage Continental CTA when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS-C contracts are maintained and monitored by an automated flight data processor (for example, ATOP).

**1. PARAGRAPH NUMBER AND TITLE: 9-3-2. SEPARATION MINIMA**

**2. BACKGROUND:** In May 2017, an SRM panel evaluated certain space launches in the NAS. As a result of this panel, the Acceptable Level of Risk (ALR) concept was devised, which created requirements for aircraft operations in the vicinity of space launch and reentry operations.

**3. CHANGE:****OLD****9-3-2. SEPARATION MINIMA**

Unless clearance of nonparticipating aircraft in/through/adjacent to a prohibited/restricted/warning area/MOA/ATCAA/stationary ALTRV is provided for in a letter of agreement (LOA) or letter of procedure (LOP), separate nonparticipating aircraft from active special use airspace, ATCAAs, and stationary ALTRVs by the following minima:

Add

a through a *REFERENCE*

b. Provide radar separation of 3 miles (FL 600 and above – 6 miles) from the special use airspace, ATCAA, or stationary ALTRV peripheral boundary.

Add

Add

c. Clear aircraft on airways or routes whose widths or protected airspace do not overlap the peripheral boundary.

d. Exception. Some prohibited/restricted/warning areas are established for security reasons or to contain hazardous activities not involving aircraft operations. Where facility management has identified these areas as outlined in FAA Order JO 7210.3, Facility Operation and Administration, vector aircraft to remain clear of the peripheral boundary.

**NEW****9-3-2. SEPARATION MINIMA**

No Change

**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, ATCAA, or stationary ALTRV. VFR traffic is not prohibited from transiting stationary ALTRVs or transitional hazard areas (THA).

No Change

b. Provide radar separation of 3 miles (FL 600 and above – 6 miles) from the special use airspace, ATCAA, or stationary ALTRV peripheral boundary. **EXCEPTIONS:**

**1. Some prohibited/restricted/warning areas are established for security reasons or to contain hazardous activities not involving aircraft operations. Where facility management has identified these areas as outlined in FAA Order JO 7210.3, Facility Operation and Administration, vector aircraft to remain clear of the peripheral boundary.**

**2. For stationary ALTRVs issued for the purpose of space launch or reentry operations, ensure aircraft remain clear of the peripheral boundary.**

No Change

**d. For stationary ALTRVs and temporary flight restrictions (TFR) issued for the purpose of space launch or reentry operations to protect aircraft hazard areas (AHA):**

**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, ATCAA, or stationary ALTRV in question. VFR traffic is not prohibited from transiting stationary ALTRVs.

Delete

Add

**1. Do not allow nonparticipating aircraft to operate in an AHA unless real-time notifications of the actual start of activity and end of activity of the AHA is provided to affected facilities via ATCSCC coordination.**

Add

**2. Do not provide ATC services to aircraft at airports that lie within an AHA unless real-time notifications of the actual start of activity and end of activity of the AHA is provided to affected facilities via ATCSCC coordination.**

Add

**REFERENCE-**  
**FAA Order JO 7210.3, Para 20-6-4, Airports within Aircraft Hazard Areas and Transitional Hazard Areas.**

Add

**e. For NOTAMs issued for the purpose of space launch or reentry operations to protect THAs:**

Add

**1. Aircraft may enter provided they are not holding, loitering, or hovering, and are cleared on:**

Add

**(a) Routing approved by the ATCSCC that has an angular difference of 30 through 150 degrees from the launch/reentry course, or**

Add

**(b) Crossing courses that have an angular difference of 45 through 135 degrees from the launch/reentry course.**

Add

**NOTE-**  
**The intent is to provide a crossing angle that accounts for the effects of wind.**

Add

**REFERENCE-**  
**FAA Order JO 7110.65, Para 1-2-2, Course Definitions.**

Add

**2. Do not provide ATC services to aircraft at airports that lie within a THA unless real-time notifications of the actual start of activity and end of activity of the THA is provided to affected facilities via ATCSCC coordination.**

Add

**REFERENCE-**  
**FAA Order JO 7210.3, Para 20-6-4, Airports within Aircraft Hazard Areas and Transitional Hazard Areas.**