CHANGE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

JO 7110.65Z
CHG 1

Effective Date:
December 2, 2021

SUBJ: Air Traffic Control

1. Purpose of This Change. This change transmits revised pages to Federal Aviation Administration Order JO 7110.65Z, 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 and https://employees.faa.gov/tools_resources/orders_notices/.

4. Explanation of Policy Change. See the Explanation of Changes attachment that 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 Retain this transmittal until superseded by a new basic order.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.

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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
2–1–9. REPORTING ESSENTIAL FLIGHT INFORMATION
10–6–4. INFLIGHT CONTINGENCIES
10–7–1. INFORMATION RELAY
10–7–5. EXTENDED NOTIFICATION

This editorial change complies with the Federal Women's Program (FWP) suggestions. The acronym NOTAM is updated from Notice to Airmen to the more applicable term Notice to Air Missions, which is inclusive of all aviators and missions.

b. 1–2–6. ABBREVIATIONS
4–2–1. CLEARANCE ITEMS
4–3–2. DEPARTURE CLEARANCES
4–8–9. MISSED APPROACH
5–6–1. APPLICATION
5–6–2. METHODS
5–6–3. VECTORS BELOW MINIMUM ALTITUDE
5–8–1. PROCEDURES
5–8–2. INITIAL HEADING

This change addresses revisions in Standard Instrument Departure (SID) criteria that have not been incorporated into Terminal Instrument Procedures (TERPS) for radar vector SIDs. Additionally, Diverse Vector Areas (DVAs) cannot be used concurrently with a SID when the SID is included as part of the IFR clearance. This change also addresses: 1. Vectors below Minimum Altitude by adding the Terminal Domain, addressing the FUSION environment by including mention of Increased Separation Required (ISR), adding additional methods that may be employed when vectoring below the minimum altitude, and addressing when radar vectors are used for aircraft conducting missed approaches or conducting go–arounds. 2. Adds provisions under Radar Departures so that SIDs and DVAs are not used concurrently. This also accounts for new TERPS criteria that will include a range of headings specified in the SID departure route description when phrases similar to "or as assigned by ATC" are published. 3. Corrects an ambiguity between the vectoring of missed approach aircraft once it commences and the requirements for vectoring below the minimum altitude. 4. Adds new procedures under Vectors below Minimum Altitude to permit vectoring in accordance with Radar SIDs under procedures outlined in a facility directive, permit vectoring when there are no prominent obstacles within 10 NM from the departure end of runway (DER), and assuring that after the first minimum vectoring altitude/minimum IFR altitude (MVA/MIA) sector is reached, all subsequent MVA/MIA sectors encountered are met. 5. Adds a new provision to provide an amended departure clearance to a pilot when cancelling a previously assigned SID and subsequently utilize a DVA or vice versa and do so in a timely manner so that the pilot can brief the changes before entering the takeoff runway.

c. 2–1–3. PROCEDURAL PREFERENCE
11–1–1. DUTY RESPONSIBILITY
11–1–2. DUTIES AND RESPONSIBILITIES
11–1–3. TIME BASED FLOW MANAGEMENT (TBFM)

This change adds trajectory–based operations (TBO) and time–based management (TBM) language to Chapter 2 and Chapter 11 of the order.

d. 2–1–26. SUPERVISORY NOTIFICATION

This change adds suspicious unmanned aircraft system (UAS) activity to the existing list contained in paragraph 2–1–26, which directs all personnel performing ATC duties to notify the operational supervisor (OS)/controller–in–charge (CIC) of flight activities that could have an impact to sector/position operations. In addition, the term "suspicious UAS" is added to the pilot controller glossary. This chance cancels and incorporates N JO 7110.780, which was effective May 21st, 2021.

e. 4–3–2. DEPARTURE CLEARANCES

This change adds guidance to subparagraph 4–3–2c2 regarding issuing a remain within distance when issuing a departure clearance that includes a Visual Climb Over airport (VCOA). It also provides example phraseology, and removes subparagraph 4–3–2c3 as it no longer provides the purpose that was intended.

f. 5–1–1. PRESENTATION AND EQUIPMENT PERFORMANCE
5–1–2. ALIGNMENT ACCURACY CHECK
5–1–3. ATC SURVEILLANCE SOURCE USE
5–1–4. BEACON RANGE ACCURACY
5–1–6. SERVICE LIMITATIONS
5–1–7. ELECTRONIC CURSOR
5–1–11. RADAR FIX POSTING
5–5–6. EXCEPTIONS

This change deletes several obsolete paragraphs and subparagraphs: 5–1–2, Alignment Accuracy Check; 5–1–4, Beacon Range Accuracy; 5–1–6, Service Limitations, subparagraphs a and b; and 5–1–7, Electronic Cursor. For better organization, paragraph 5–1–6, subparagraph b is moved to paragraph 5–5–6, Exceptions, as new subparagraph c; and paragraph 5–1–6, subparagraph c is updated and moved to paragraph 5–1–1, Presentation and Equipment Performance, as new subparagraph b. This change also rewrites paragraph 5–1–11, Radar Fix Posting, for better conformity with FAA Writing Standards, and deletes an obsolete reference.

g. 5–2–1. ASSIGNMENT CRITERIA
5–2–2. DISCRETE ENVIRONMENT
5–2–3. NONDISCRETE ENVIRONMENT
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5–2–7. EMERGENCY CODE ASSIGNMENT
5–2–8. RADIO FAILURE
5–2–9. UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK
5–2–10. VFR CODE ASSIGNMENTS
5–2–11. BEACON CODE FOR PRESSURE SUIT FLIGHTS AND FLIGHTS ABOVE FL 600
5–2–14. CODE MONITOR

This change removes several paragraphs and subparagraphs from JO 7110.65, Chapter 5, Section 2, containing obsolete information and procedures regarding discrete, nondiscrete, and mixed beacon code environments; function code assignments; and non–automated beacon decoding equipment. This change removes certain beacon code allocation information that is now contained in FAA Order JO 7610.4, Special Operations; and updates information in paragraph 5–2–7, VFR Code Assignments, regarding use of code 1202 for VFR gliders to reflect a recent change to FAA Order JO 7110.66, National Beacon Code Allocation Plan. This change adds information regarding what is displayed in the data block when an aircraft squawks 7400 (UAS Lost Link), 7500 (Hijack), 7600 (Communications Failure), or 7700 (Emergency). For all three FAA automation systems, the actual beacon code is not displayed for these four codes. In ERAM, the characters shown are “LLNK” for 7400, “HIJK” for 7500, “RDOF” for 7600, and “EMRG” for 7700; and in STARS and MEARTS, those characters are “LL,” “HJ,” “RF,” and “EM,” respectively. This change also makes minor editorial changes for better readability.

h. 5–3–3. BEACON/ADS–B IDENTIFICATION METHODS

This change corrects the phraseology to be used when establishing surveillance identification for en route aircraft.

i. 9–2–13. MILITARY AERIAL REFUELING

This change, when authorizing aerial refueling operations, deletes MAINTAIN REFUELING LEVEL (altitude) and incorporates existing phraseology to reflect the assignment of multiple altitudes as required, providing consistency between directives JO 7610.4 and JO 7110.65.

j. Editorial Changes

Editorial changes include the deletion of the abbreviation for automation embedded route text (AERT) and Bigelow Aerospace Advanced Space Studies (BAASS) and the addition of the abbreviation for embedded route text (ERT). In paragraph 9–3–2, Space Operations at ATCSCC is now called ATO Space Operations. The term/abbre-

viation acceptance rate is replaced with arrival rate. Out of date contact information for the Domestic Events Network (DEN) is deleted. An out of date reference is fixed in paragraph 5−15−4. Also, a broken link is fixed and some out of date references are corrected, including to departure clearance/IFR flight plan in paragraph 4−3−4f NOTE.

k. 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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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	Adapted arrival route
AAR	Airport arrival rate
AC	Advisory Circular
ACC	Area Control Center
ACE–IDS . . .	ASOS Controller Equipment– Information Display System
ACL	Aircraft list
ACLS	Automatic Carrier Landing System
ADAR	Adapted departure arrival route
ADC	Aerospace Defense Command
ADIZ	Air Defense Identification Zone (to be pronounced "AY DIZ")
ADR	Adapted departure route
ADS	Automatic Dependent Surveillance
ADS–B	Automatic Dependent Surveillance–Broadcast
ADS–C	Automatic Dependent Surveillance–Contract
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 STARS 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
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
BASE	Cloud base
CA	Conflict Alert
CARCAH . . .	Chief, Aerial Reconnaissance Coordination, All Hurricanes
CARF	Central Altitude Reservation Function
CAT	Clear air turbulence
CDT	Controlled departure time
CEP	Central East Pacific

Abbreviation	Meaning
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	Charted 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
EOVM	Emergency obstruction video map
EOS	End Service
ERAM	En Route Automation Modernization
ERIDS	En Route Information Display System
ERT	Embedded route text
ETA	Estimated time of arrival

Abbreviation	Meaning
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
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
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

Abbreviation	Meaning
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
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 Air Missions

Abbreviation	Meaning
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
PBCT	Proposed boundary crossing time
P/CG	Pilot/Controller Glossary
PDC	Pre−Departure Clearance
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
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

Abbreviation	Meaning
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
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

Abbreviation	Meaning
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

Chapter 2. General Control

Section 1. General

2–1–1. ATC SERVICE

a. The primary purpose of the ATC system is to prevent a collision involving aircraft operating in the system.

b. In addition to its primary purpose, the ATC system also:

1. Provides a safe, orderly, and expeditious flow of air traffic.

2. Supports National Security and Homeland Defense missions.

c. The ATC system must provide certain additional services to the extent permitted. The provision of additional services is not optional on the part of the controller, but rather required when the work situation permits. It is recognized that the provision of these services may be precluded by various factors, including, but not limited to:

1. Volume of traffic.

2. Frequency congestion.

3. Quality of surveillance.

4. Controller workload.

5. Higher priority duties.

6. The physical inability to scan and detect situations falling in this category.

d. Controllers must provide air traffic control service in accordance with the procedures and minima in this order, except when one or more of the following conditions exists:

1. A deviation is necessary to conform with ICAO Documents, National Rules of the Air, or special agreements where the U.S. provides air traffic control service in airspace outside the U.S. and its possessions or:

NOTE–
Pilots are required to abide by CFRs or other applicable regulations regardless of the application of any procedure or minima in this order.

2. Other procedures/minima are prescribed in a letter of agreement, FAA directive, or a military document, or:

NOTE–
These procedures may include altitude reservations, air refueling, fighter interceptor operations, law enforcement, etc.

REFERENCE–
FAA Order JO 7110.65, Para 1–1–10, Procedural Letters of Agreement (LOA).

3. A deviation is necessary to assist an aircraft when an emergency has been declared.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–6, Safety Alert.
FAA Order JO 7110.65, Chapter 10, Emergencies.
FAA Order JO 7110.65, Para 5–1–4, Merging Target Procedures.

e. Air Traffic Control services are not provided for model aircraft operating in the NAS or to any UAS operating in the NAS at or below 400ft AGL.

NOTE–
1. *This does not prohibit ATC from providing services to civil and public UAS.*

2. *The provisions of this paragraph apply to model aircraft operating at any altitude. For all other UAS, this paragraph applies only to those UAS operating entirely at or below 400ft AGL.*

REFERENCE–
P/CG Term – Model Aircraft.

2–1–2. DUTY PRIORITY

a. Give first priority to separating aircraft and issuing safety alerts as required in this order. Good judgment must be used in prioritizing all other provisions of this order based on the requirements of the situation at hand.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–6, Safety Alert.

NOTE–
Because there are many variables involved, it is virtually impossible to develop a standard list of duty priorities that would apply uniformly 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. That action which is most critical from a safety standpoint is performed first.

b. Provide support to national security and homeland defense activities to include, but not be limited to, reporting of suspicious and/or unusual aircraft/pilot activities.

REFERENCE–
FAA Order JO 7610.4 Special Operations.

c. Provide and/or solicit weather information in accordance with procedures and requirements outlined in this order.

NOTE–
Controllers are responsible to become familiar with and stay aware of current weather information needed to perform ATC duties.

d. Provide additional services to the extent possible, contingent only upon higher priority duties and other factors including limitations of radar, volume of traffic, frequency congestion, and workload.

2–1–3. PROCEDURAL PREFERENCE

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

b. Use automation procedures that provide closed loop clearances in preference to open loop clearances to promote operational advantage for time–based management (TBM) when workload permits. (e.g., a QU route pick that anticipates length of vector and includes the next fix that ties into the route of flight.)

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

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

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

2–1–4. OPERATIONAL PRIORITY

It is recognized that traffic flow may affect the controller's ability to provide priority handling. However, without compromising safety, good judgment must be used in each situation to facilitate the most expeditious movement of priority aircraft. Provide air traffic control service to aircraft on a "first come, first served" basis as circumstances permit, except the following:

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

a. An aircraft in distress has the right of way over all other air traffic.

REFERENCE–
14 CFR Section 91.113(c).

b. Treat air ambulance flights as follows:

1. Provide priority handling to civil air ambulance flights when the pilot, in radio transmissions, verbally identifies the flight by stating "MEDEVAC" followed by the FAA authorized call sign or the full civil registration letters/numbers. Good judgment must be used in each situation to facilitate the most expeditious movement of a MEDEVAC aircraft.

NOTE–
If a flight plan includes the letter "L" for "MEDEVAC" and/or includes "MEDEVAC" in Item 11 (Remarks) of the flight plan or Item 18 (Other Information) of an international flight plan, the entries are considered informational in nature only and not an identification for operational priority.

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

2. Provide priority handling to AIR EVAC and HOSP flights when verbally requested by the pilot.

NOTE–
If a flight plan includes "HOSP" or "AIR EVAC" in either Item 11 (Remarks) or Item 18 (Other Information) of an international flight plan, the entries are considered informational in nature only and not an identification for operational priority. For aircraft identification in radio transmissions, civilian pilots will use normal call signs when filing "HOSP" and military pilots will use the "EVAC" call sign.

3. Assist the pilots of MEDEVAC, AIR EVAC, and HOSP aircraft to avoid areas of significant weather and adverse conditions.

4. If requested by a pilot, provide additional assistance (i.e., landline notifications) to expedite ground handling of patients, vital organs, or urgently needed medical materials.

c. Provide priority handling and expedite the movement of presidential aircraft and entourage and any rescue support aircraft as well as related control messages when traffic conditions and communications facilities permit.

NOTE–
As used herein the terms presidential aircraft and entourage include aircraft and entourage of the President, Vice President, or other public figures when designated by the White House.

REFERENCE–
FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.
FAA Order JO 7110.65, Para 4–3–2, Departure Clearances.
FAA Order JO 7210.3, Para 5–1–1, Advance Coordination.

d. Provide priority handling and maximum assistance to SAR aircraft performing a SAR mission.

REFERENCE–
FAA Order JO 7110.65, Para 10–1–3, Providing Assistance.

e. Provide priority handling and maximum assistance to expedite the movement of interceptor aircraft on active air defense missions until the unknown aircraft is identified.

f. Provide priority handling to NIGHT WATCH aircraft when NAOC (pronounced NA–YOCK) is indicated in the remarks section of the flight plan or in air/ground communications.

NOTE–
The term "NAOC" will not be a part of the call sign but may be used when the aircraft is airborne to indicate a request for special handling.

REFERENCE–
FAA Order JO 7610.4, Para 12–1–1, Applications.

g. Provide priority handling to any civil or military aircraft using the code name "FLYNET."

REFERENCE–
FAA Order JO 7110.65, Para 9–2–5, FLYNET.
FAA Order JO 7610.4, Para 12–4–1, "FLYNET" Flights, Nuclear Emergency Teams.

h. Provide priority handling to aircraft using the code name "Garden Plot" only when CARF notifies you that such priority is authorized. Refer any questions regarding flight procedures to CARF for resolution.

NOTE–
Garden Plot flights require priority movement and are coordinated by the military with CARF. State authority will contact the Regional Administrator to arrange for priority of National Guard troop movements within a particular state.

i. Provide priority handling to USAF aircraft engaged in aerial sampling/surveying missions using the call sign "SAMP."

REFERENCE–
FAA Order JO 7110.65, Para 9–2–17, SAMP Flights.
FAA Order JO 7210.3, Para 5–3–2, Aerial Sampling/Surveying For Nuclear Contamination.
FAA Order JO 7610.4, Para 12–4–3, Aerial Sampling/Surveying For Nuclear Contamination.

j. Provide priority handling to Special Air Mission aircraft when SCOOT is indicated in the remarks section of the flight plan or used in air/ground communications.

NOTE–
The term "SCOOT" will not be part of the call sign but may be used when the aircraft is airborne to indicate a request for special handling.

REFERENCE–
FAA Order JO 7610.4, Para 12–6–1, Applications.

k. When requested, provide priority handling to TEAL and NOAA mission aircraft.

REFERENCE–
FAA Order JO 7110.65, Para 9–2–19, Weather Reconnaissance Flights.

l. Provide priority handling to expedite the movement of OPEN SKIES Treaty observation and demonstration (F and D) flights.

NOTE–
An Open Skies Treaty (F and D) aircraft has priority over all "regular" air traffic. "Regular" is defined as all aircraft traffic other than:

1. *Emergencies*
2. *Aircraft directly involved in presidential movement.*
3. *Forces or activities in actual combat.*
4. *MEDEVAC, and active SAR missions.*
5. *AIR EVAC and HOSP aircraft that have requested priority handling.*

REFERENCE–
FAA Order JO 7110.65, Para 9–2–22, Open Skies Treaty Aircraft.
FAA Order JO 7210.3, Para 5–3–5, Open Skies Treaty Aircraft Priority Flights (F and D).
Treaty on Open Skies, Treaty Document, 102–37.

m. Provide priority handling, as required to expedite Flight Check aircraft.

NOTE–
It is recognized that unexpected wind conditions, weather, or heavy traffic flows may affect controller's ability to provide priority or special handling at the specific time requested.

REFERENCE–
FAA Order JO 7110.65, Para 9–1–3, Flight Check Aircraft.

n. IFR aircraft must have priority over SVFR aircraft.

REFERENCE–
FAA Order JO 7110.65, Chapter 7, Section 5, Special VFR (SVFR).

o. Aircraft operating under the North American Route Program (NRP) are not subject to route limiting restrictions (e.g., published preferred IFR routes, letter of agreement requirements, standard operating procedures).

REFERENCE–
FAA Order JO 7110.65, Para 2–3–2, En Route Data Entries.
FAA Order JO 7110.65, Para 2–2–15, North American Route Program (NRP) Information.
FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments.
FAA Order JO 7210.3, Chapter 18, Section 17, North American Route Program.

p. If able, provide priority handling to diverted flights. Priority handling may be requested via use of "DVRSN" in the remarks section of the flight plan or by the flight being placed on the Diversion Recovery Tool (DRT).

REFERENCE–
FAA Order JO 7210.3, Para 18–4–5, Diversion Recovery.

q. If able, provide priority handling to FALLEN HERO flights when "FALLEN HERO" is indicated in the remarks section of the flight plan or requested in air/ground communications.

2–1–5. EXPEDITIOUS COMPLIANCE

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

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

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

2–1–6. SAFETY ALERT

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

NOTE–
1. *The issuance of a safety alert is a first priority (see paragraph 2–1–2, Duty Priority) once the controller observes and recognizes a situation of unsafe aircraft proximity to terrain, obstacles, or other aircraft. Conditions, such as workload, traffic volume, the quality/limitations of the radar system, and the available lead time to react are factors in determining whether it is reasonable for the controller to observe and recognize such situations. While a controller cannot see immediately the development of every situation where a safety alert must be issued, the controller must remain vigilant for such situations and issue a safety alert when the situation is recognized.*

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

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

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

PHRASEOLOGY–
LOW ALTITUDE ALERT (call sign),

CHECK YOUR ALTITUDE IMMEDIATELY.

and, if the aircraft is not yet on final approach,

THE (as appropriate) MEA/MVA/MOCA/MIA IN YOUR AREA IS (altitude).

REFERENCE–
P/CG Term – Final Approach – IFR

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

PHRASEOLOGY–
TRAFFIC ALERT (call sign) (position of aircraft) ADVISE YOU TURN LEFT/RIGHT (heading),

and/or

CLIMB/DESCEND (specific altitude if appropriate) IMMEDIATELY.

EXAMPLE–
"Traffic Alert, Cessna Three Four Juliet, 12'o clock, 1 mile advise you turn left immediately."
or
"Traffic Alert, Cessna Three-Four Juliet, 12'o clock, 1 mile advise you turn left and climb immediately."

REFERENCE–
FAA Order JO 7110.65, Para 5–14–1, Conflict Alert (CA) and Mode C Intruder (MCI) Alert.
FAA Order JO 7110.65, Para 5–14–2, En Route Minimum Safe Altitude Warning (E–MSAW).
FAA Order JO 7110.65, Para 5–15–6, CA/MCI.
FAA Order JO 7110.65, Para 5–2–21, Altitude Filters.
FAA Order JO 7110.65, Para 2–1–21, Traffic Advisories.

2–1–7. INFLIGHT EQUIPMENT MALFUNCTIONS

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

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

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

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

2–1–8. MINIMUM FUEL

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

NOTE–
Use of the term "minimum fuel" indicates recognition by a pilot that his/her fuel supply has reached a state where, upon reaching destination, he/she cannot accept any undue delay. This is not an emergency situation but merely an advisory that indicates an emergency situation is possible should any undue delay occur. A minimum fuel advisory does not imply a need for traffic priority. Common sense and good judgment will determine the extent of assistance to be given in minimum fuel situations. If, at any time, the remaining usable fuel supply suggests the need for traffic priority to ensure a safe landing, the pilot should declare an emergency and report fuel remaining in minutes.

2–1–9. REPORTING ESSENTIAL FLIGHT INFORMATION

Report as soon as possible to the appropriate FSS, airport manager's office, ARTCC, approach control facility, operations office, or military operations office any information concerning components of the NAS or any flight conditions which may have an adverse effect on air safety.

NOTE–
FSSs are responsible for classifying and disseminating Notices to Air Missions.

REFERENCE–
FAA Order JO 7110.65, Para 3–3–3, Timely Information.
FAA Order JO 7210.3, Para 3–1–2, Periodic Maintenance.
USN, See OPNAVINST 3721.30.

2–1–10. NAVAID MALFUNCTIONS

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

1. Request a report from a second aircraft.

2. If the second aircraft reports normal operations, continue use and inform the first aircraft. Record the incident on FAA Form 7230–4 or appropriate military form.

3. If the second aircraft confirms the malfunction or in the absence of a second aircraft report, activate the standby equipment or request the monitor facility to activate.

4. If normal operation is reported after the standby equipment is activated, continue use, record the incident on FAA Form 7230–4 or appropriate military form, and notify technical operations personnel (the Systems Engineer of the ARTCC when an en route aid is involved).

5. If continued malfunction is reported after the standby equipment is activated or the standby equipment cannot be activated, inform technical operations personnel and request advice on whether

or not the aid should be shut down. In the absence of a second aircraft report, advise the technical operations personnel of the time of the initial aircraft report and the estimated time a second aircraft report could be obtained.

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

1. Record the following minimum information:

(a) Aircraft make, model, and call sign.

(b) Location or position, and altitude at the time where GPS or WAAS anomaly was observed.

(c) Date/time of occurrence.

2. Request a report from a second aircraft.

3. Record the incident on FAA Form 7230−4 or appropriate military form.

4. Inform other aircraft of the anomaly as specified in paragraph 4−8−1j or k, as applicable.

PHRASEOLOGY−
ATTENTION ALL AIRCRAFT, GPS REPORTED UNRELIABLE (OR WAAS UNAVAILABLE) IN VICINITY/AREA (position).

EXAMPLE−
"Attention all aircraft, GPS reported unreliable (or WAAS unavailable) in the area 30 miles south of Waco VOR."

c. When a pilot reports a WAAS anomaly, determine from the pilot what indications he or she observes and record the information in accordance with subparagraph b above.

2−1−11. USE OF MARSA

a. MARSA may only be applied to military operations specified in a letter of agreement or other appropriate FAA or military document.

NOTE−
Application of MARSA is a military command prerogative. It will not be invoked indiscriminately by individual units or pilots. It will be used only for IFR operations requiring its use. Commands authorizing MARSA will ensure that its implementation and terms of use are documented and coordinated with the control agency having jurisdiction over the area in which the operations are conducted. Terms of use will assign responsibility and provide for separation among participating aircraft.

b. ATC facilities do not invoke or deny MARSA. Their sole responsibility concerning the use of MARSA is to provide separation between military aircraft engaged in MARSA operations and other nonparticipating IFR aircraft.

c. DOD must ensure that military pilots requesting special use airspace/ATCAAs have coordinated with the scheduling agency, have obtained approval for entry, and are familiar with the appropriate MARSA procedures. ATC is not responsible for determining which military aircraft are authorized to enter special use airspace/ATCAAs.

REFERENCE−
FAA Order JO 7110.65, Para 9−2−13, Military Aerial Refueling.

2−1−12. MILITARY PROCEDURES

Military procedures in the form of additions, modifications, and exceptions to the basic FAA procedure are prescribed herein when a common procedure has not been attained or to fulfill a specific requirement. They must be applied by:

a. ATC facilities operated by that military service.

EXAMPLE−
1. *An Air Force facility providing service for an Air Force base would apply USAF procedures to all traffic regardless of class.*

2. *A Navy facility providing service for a Naval Air Station would apply USN procedures to all traffic regardless of class.*

b. ATC facilities, regardless of their parent organization (FAA, USAF, USN, USA), supporting a designated military airport exclusively. This designation determines which military procedures are to be applied.

EXAMPLE−
1. *An FAA facility supports a USAF base exclusively; USAF procedures are applied to all traffic at that base.*

2. *An FAA facility provides approach control service for a Naval Air Station as well as supporting a civil airport; basic FAA procedures are applied at both locations by the FAA facility.*

3. *A USAF facility supports a USAF base and provides approach control service to a satellite civilian airport; USAF procedures are applied at both locations by the USAF facility.*

REFERENCE−
FAA Order JO 7110.65, Para 1−2−5, Annotations.

c. Other ATC facilities when specified in a letter of agreement.

EXAMPLE–
A USAF unit is using a civil airport supported by an FAA facility– USAF procedures will be applied as specified in a letter of agreement between the unit and the FAA facility to the aircraft of the USAF unit. Basic FAA procedures will be applied to all other aircraft.

2–1–13. FORMATION FLIGHTS

Control formation flights as a single aircraft. Separation responsibility between aircraft within the formation rests with 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 during join–up and breakaway.

REFERENCE–
P/CG Term – Formation Flight
FAA Order JO 7610.4, Chapter 12, Section 11. Formation Flight
ICAO Annex 2, 3.1.8 Formation Flights

a. Support formation flight join–up for two aircraft when all of the following occur:

1. Requested by any participating pilot.

2. All participating pilots concur.

3. Either of the participating pilots reports the other/s in sight.

EXAMPLE–
"ROOK01 has EAGLE03 in sight, request formation join–up with EAGLE03 at flight level two zero zero. EAGLE03 will be the lead."

"EAGLE03 verify requesting flight join–up with ROOK01."

If affirmative:

"ROOK01 climb and maintain flight level two zero zero. Report (advise) when formation join–up is complete."

b. If multiple single aircraft request to join–up, multiple formations are joining as one, or aircraft are joining an established formation, obtain confirmation of required items listed in subparagraph 2–1–13a, from the lead aircraft.

REFERENCE–
P/CG Term – Formation Flight

c. After join–up, aircraft beacon code assignment will be determined by formation type.

1. For a standard formation only the aircraft acting as the lead will squawk an ATC assigned beacon code. Ensure all other aircraft squawk standby.

2. For a nonstandard formation, each aircraft should squawk an ATC assigned beacon code. Controller discretion allows aircraft in a nonstandard formation to squawk standby if operationally advantageous.

REFERENCE–
FAA Order JO 7610.4, Para 12–11–6, Nonstandard Formation Tactics, subparagraph b3.

EXAMPLE–
"N123JP squawk standby."

Or

"N123SP have N123JP squawk standby."

d. When formation break–up is requested, issue control instructions and/or clearances which will result in approved separation through the lead or directly to the requesting aircraft in the formation.

EXAMPLE–
"N5871S requesting flight break–up with N731K. N731K is changing destination to PHL."
"N731K squawk 5432, turn right, fly heading zero–seven–zero.

"Center, BAMA21. BAMA23 is requesting to RTB."
"BAMA21 have BAMA23 squawk 5544, descend and maintain flight level one–niner–zero and change to my frequency."

"Center, BAMA21. BAMA23 is requesting to RTB."
"BAMA23 squawk 5544. BAMA23 Radar contact (position if required). Cleared to SSC via direct. Descend and maintain flight level one–niner–zero."

REFERENCE–
FAA Order JO 7110.65, Para 5–5–8, Additional Separation for Formation Flights.
P/CG Term– Formation Flight.

e. Military and civil formation flights in RVSM airspace.

1. Utilize RVSM separation standards for a formation flight, which consists of all RVSM approved aircraft.

2. Utilize non–RVSM separation standards for a formation flight above FL 290, which does not consist of all RVSM approved aircraft.

3. If aircraft are requesting to form a formation flight to FL 290 or above, the controller who issues

the clearance creating the formation flight is responsible for ensuring that the proper equipment suffix is entered for the lead aircraft.

4. If the flight departs as a formation, and is requesting FL 290 or above, the first center sector must ensure that the proper equipment suffix is entered.

5. If the formation flight is below FL 290 and later requests FL 290 or above, the controller receiving the RVSM altitude request must ensure the proper equipment suffix is entered.

6. Upon break–up of the formation flight, the controller initiating the break–up must ensure that all aircraft or flights are assigned their proper equipment suffix.

2–1–14. COORDINATE USE OF AIRSPACE

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

b. Before you issue a control instruction directly to a pilot that will change the aircraft's heading, route, speed, or altitude, you must ensure that coordination has been completed with all controllers whose area of jurisdiction is affected by those instructions unless otherwise specified by a letter of agreement or facility directive. If your control instruction will be relayed to the pilot through a source other than another radar controller (FSS, New York Radio, San Francisco Radio, another pilot, etc.), you are still responsible to ensure that all required coordination is completed.

NOTE–
1. *It is good operating practice for controllers to confirm that required coordination has been/will be effected, especially in unusual circumstances, such as recently modified sector configurations, airspace changes, route changes, etc.*

2. *Ensuring that all required coordination has been completed does not necessarily imply that the controller issuing the control instruction directly to the pilot has to perform the coordination action.*

REFERENCE–
FAA Order JO 7110.65, Para 2–1–15, Control Transfer.
FAA Order JO 7110.65, Para 5–5–10, Adjacent 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.

2–1–15. CONTROL TRANSFER

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

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

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

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.

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

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

2–1–16. SURFACE AREAS

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

REFERENCE–
FAA Order JO 7210.3, Para 4–3–1, Letters of Agreement.
14 CFR Section 91.127, Operating on or in the Vicinity of an Airport in Class E Airspace.
P/CG Term – Surface Area.

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

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

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

REFERENCE–
FAA Order JO 7110.65, Para 2–1–17, Radio Communications.
FAA Order JO 7110.65, Para 3–1–11, Surface Area Restrictions.
FAA Order JO 7110.65, Para 7–6–1, Application.
14 CFR Section 91.129, Operations in Class D Airspace.

2–1–17. RADIO COMMUNICATIONS

a. Transfer radio communications before an aircraft enters the receiving controller's area of jurisdiction unless otherwise coordinated or specified by a letter of agreement or a facility directive.

b. Transfer radio communications by specifying the following:

NOTE–
Radio communications transfer procedures may be specified by a letter of agreement or contained in the route description of an MTR as published in the DOD Planning AP/1B (AP/3).

1. The facility name or location name and terminal function to be contacted. *TERMINAL*: Omit the location name when transferring communications to another controller within your facility, or, when the tower and TRACON share the same name (for example, Phoenix Tower and Phoenix TRACON).

EXCEPTION. Controllers must include the name of the facility when instructing an aircraft to change frequency for final approach guidance.

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

(a) FSS frequency.

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

(c) *TERMINAL:*

(1) Ground or local control frequency if in your opinion the pilot knows which frequency is in use.

(2) The numbers preceding the decimal point if the ground control frequency is in the 121 MHz bandwidth.

EXAMPLE–
"Contact Tower."
"Contact Ground."
"Contact Ground Point Seven."
"Contact Ground, One Two Zero Point Eight."
"Contact Huntington Radio."
"Contact Departure."
"Contact Los Angeles Center, One Two Three Point Four."

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

NOTE–
AIM, paragraph 5–3–1, ARTCC Communications, informs pilots that they are expected to maintain a listening watch on the transferring controller's frequency until the time, fix, or altitude specified.

PHRASEOLOGY–
CONTACT (facility name or location name and terminal function), (frequency).

If required,

AT (time, fix, or altitude).

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

NOTE–
For the purposes of this paragraph, a reasonable amount of time is considered to be 5 minutes from the time the aircraft enters the controller's area of jurisdiction or comes within range of radio/communications coverage. Communications include two–way VHF or UHF radio contact, data link, or high frequency (HF) radio through an approved third–party provider such as New York Radio or San Francisco Radio.

d. ERAM facilities, beginning with initial audio contact with an aircraft, must utilize the voice communication indicator to reflect the current status of voice communications.

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

EXAMPLE–
"Monitor Tower."
"Monitor Ground."
"Monitor Ground Point Seven."
"Monitor Ground, One Two Zero Point Eight."

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

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

EXAMPLE–
"United two twenty-two change to my frequency one two three point four."

REFERENCE–
AIM, Para 4–2–3, Contact Procedures.

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

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

REFERENCE–
AIM, Para 4–3–14, Communications.

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

PHRASEOLOGY–
REMAIN THIS FREQUENCY.

REFERENCE–
FAA Order JO 7110.65, Para 4–7–1, Clearance Information.
FAA Order JO 7110.65, Para 5–12–9, Communication Transfer.

2–1–18. OPERATIONAL REQUESTS

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

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

PHRASEOLOGY–
(Requested operation) APPROVED.

or

APPROVED AS REQUESTED.

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

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

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

PHRASEOLOGY–
UNABLE (requested operation).

and when necessary,

(reason and/or additional instructions.)

d. State the words "STAND BY."

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

REFERENCE–
FAA Order JO 7110.65, Para 2–1–21, Traffic Advisories.
FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments.
FAA Order JO 7110.65, Para 7–9–3, Methods.

2–1–19. WAKE TURBULENCE

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

NOTE–
Paragraph 5–5–4, Minima, subparagraphs g and h specify the required radar wake turbulence separations. Time-based separations are contained in paragraph 3–9–6, Same Runway Separation, paragraph 3–9–7, Wake Turbulence Separation for Intersection Departures, paragraph 3–9–8, Intersecting Runway Separation, paragraph 3–9–9, Nonintersecting Converging Runway Operations, paragraph 3–10–3, Same Runway Separation, paragraph 3–10–4, Intersecting Runway Separation, paragraph 6–1–4, Adjacent Airport Operation, paragraph 6–1–5, Arrival Minima, and paragraph 6–7–5, Interval Minima.

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

REFERENCE–
FAA Order JO 7110.65, Para 5–9–5, Approach Separation Responsibility.

2–1–20. WAKE TURBULENCE CAUTIONARY ADVISORIES

a. Issue wake turbulence cautionary advisories including the position, altitude if known, and direction of flight to aircraft operating behind an aircraft that requires wake turbulence separation when:

REFERENCE–
AC 90–23, Aircraft Wake Turbulence, Pilot Responsibility, Para 11.
FAA Order JO 7110.65, Para 5–5–4, Minima, subpara g.

1. *TERMINAL.* VFR aircraft not being radar vectored are behind the larger aircraft.

2. IFR aircraft accept a visual approach or visual separation.

REFERENCE–
FAA Order JO 7110.65, Para 7–4–1, Visual Approach.

3. *TERMINAL.* VFR arriving aircraft that have previously been radar vectored and the vectoring has been discontinued.

b. Issue cautionary information to any aircraft if in your opinion, wake turbulence may have an adverse effect on it. When traffic is known to be a Super aircraft, include the word *Super* in the description. When traffic is known to be a Heavy aircraft, include the word *Heavy* in the description.

NOTE–
Wake turbulence is generated when an aircraft produces lift. Because the location of wake turbulence is difficult to determine, the controller is not responsible for anticipating its existence or effect. Aircraft flying through a Super/Heavy aircraft's flight path may have an increased chance of a wake encounter.

REFERENCE–
AC 90–23, Aircraft Wake Turbulence.
P/CG Term– Aircraft Classes.
P/CG Term– Wake Turbulence.

PHRASEOLOGY–
CAUTION WAKE TURBULENCE (traffic information).

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

2–1–21. TRAFFIC ADVISORIES

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

a. To radar identified aircraft:

1. Azimuth from aircraft in terms of the 12–hour clock, or

2. When rapidly maneuvering aircraft prevent accurate issuance of traffic as in 1 above, specify the direction from an aircraft's position in terms of the eight cardinal compass points (N, NE, E, SE, S, SW, W, and NW). This method must be terminated at the pilot's request.

3. Distance from aircraft in miles.

4. Direction in which traffic is proceeding and/or relative movement of traffic.

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

5. If known, type of aircraft and altitude.

REFERENCE–
FAA Order JO 7110.65, Para 2–4–21, Description of Aircraft Types.

PHRASEOLOGY–
TRAFFIC, (number) O'CLOCK,

or when appropriate,

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

and if known,

(type of aircraft and altitude).

or

When appropriate,

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

If altitude is unknown,

ALTITUDE UNKNOWN.

EXAMPLE–
"Traffic, eleven o'clock, one zero miles, southbound, converging, Boeing Seven Twenty Seven, one seven thousand."
"Traffic, twelve o'clock, one five miles, opposite direction, altitude unknown."
"Traffic, ten o'clock, one two miles, southeast bound, one thousand feet below you."

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

7. If unable to provide vector service, inform the pilot.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–18, Operational Requests.

8. Inform the pilot of the following when traffic you have issued is not reported in sight:

(a) The traffic is no factor.

(b) The traffic is no longer depicted on radar.

PHRASEOLOGY–
TRAFFIC NO FACTOR/NO LONGER OBSERVED,

or

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

or

(direction) TRAFFIC NO FACTOR/NO LONGER OBSERVED.

b. To aircraft that are not radar identified:

1. Distance and direction from fix.

2. Direction in which traffic is proceeding.

3. If known, type of aircraft and altitude.

4. ETA over the fix the aircraft is approaching, if appropriate.

PHRASEOLOGY–
TRAFFIC, (number) MILES/MINUTES (direction) OF (airport or fix), (direction)–BOUND,

and if known,

(type of aircraft and altitude),

ESTIMATED (fix) (time),

or

TRAFFIC, NUMEROUS AIRCRAFT VICINITY (location).

If altitude is unknown,

ALTITUDE UNKNOWN.

EXAMPLE–
"Traffic, one zero miles east of Forsythe V–O–R, Southbound, M–D Eighty, descending to one six thousand."
"Traffic, reported one zero miles west of Downey V–O–R, northbound, Apache, altitude unknown, estimated Joliet V–O–R one three one five."
"Traffic, eight minutes west of Chicago Heights V–O–R, westbound, Mooney, eight thousand, estimated Joliet V–O–R two zero three five."
"Traffic, numerous aircraft, vicinity of Delia airport."

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

EXAMPLE–
"Traffic, one o'clock, six miles, eastbound, altitude indicates six thousand five hundred."

REFERENCE–
FAA Order JO 7110.65, Para 3–1–6, Traffic Information.
FAA Order JO 7110.65, Para 7–2–1, Visual Separation.
FAA Order JO 7110.65, Para 7–6–10, VFR Departure Information.

2–1–22. UNMANNED AIRCRAFT SYSTEM (UAS) ACTIVITY INFORMATION.

a. Issue UAS advisory information for known UAS activity, when in your judgment their proximity warrants it. If known, include position, distance, course, type of unmanned aircraft (UA), and altitude.

EXAMPLE–
"U–A–S activity, 12 o'clock, 1 mile, southbound, quad copter, 400 feet and below."
"Unmanned aircraft system activity, 2 miles east of Brandywine Airport, 300 feet and below."

b. Issue UAS advisory information for pilot–reported or tower–observed activity, when in your judgment, their proximity warrants it. If known, include position, altitude, course, and type. Continue to issue advisories to potentially impacted aircraft for at least 15 minutes following the last report.

EXAMPLE–
"U–A–S activity reported, 12 o'clock, 1 mile, altitude reported one thousand two hundred."
"Unmanned aircraft system activity observed, 1 mile east of Trenton Airport, altitude unknown."

2–1–23. BIRD ACTIVITY INFORMATION

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

EXAMPLE–
"Flock of geese, one o'clock, seven miles, northbound, last reported at four thousand."
"Flock of small birds, southbound along Mohawk River, last reported at three thousand."
"Numerous flocks of ducks, vicinity Lake Winnebago, altitude unknown."

b. Relay bird activity information to adjacent facilities and to FSSs whenever it appears it will become a factor in their areas.

2–1–24. TRANSFER OF POSITION RESPONSIBILITY

The transfer of position responsibility must be accomplished in accordance with the "Standard Operating Practice (SOP) for the Transfer of Position Responsibility," and appropriate facility directives each time operational responsibility for a position is transferred from one specialist to another.

2–1–25. WHEELS DOWN CHECK

USA/USN

Remind aircraft to check wheels down on each approach unless the pilot has previously reported wheels down for that approach.

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

a. Tower must issue the wheels down check at an appropriate place in the pattern.

PHRASEOLOGY–
CHECK WHEELS DOWN.

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

1. To aircraft conducting ASR, PAR, or radar monitored approaches, before the aircraft starts descent on final approach.

2. To aircraft conducting instrument approaches and remaining on the radar facility's frequency, before the aircraft passes the outer marker/final approach fix.

PHRASEOLOGY–
WHEELS SHOULD BE DOWN.

2–1–26. SUPERVISORY NOTIFICATION

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

a. Weather.

b. Equipment status.

c. Potential sector overload.

d. Emergency situations.

e. Special flights/operations.

f. Aircraft/pilot activity, including unmanned aircraft system (UAS) operation that is considered suspicious, as prescribed in FAA Order JO 7610.4, paragraph 7–3–1, and for information more specific to UAS, FAA Order JO 7210.3, paragraph 2–1–32.

REFERENCE–
P/CG Term – Suspicious UAS.

2–1–27. PILOT DEVIATION NOTIFICATION

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

PHRASEOLOGY–
(Identification) POSSIBLE PILOT DEVIATION ADVISE YOU CONTACT (facility) AT (telephone number).

REFERENCE–
FAA Order JO 8020.16, Air Traffic Organization Aircraft Accident and Aircraft Incident Notification, Investigation, and Reporting, Chapter 11, Para 3, Air Traffic Facility Responsibilities.

2–1–28. TCAS RESOLUTION ADVISORIES

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

b. Unless advised by other aircraft that they are also responding to a TCAS RA, do not assume that other aircraft in the proximity of the responding aircraft are involved in the RA maneuver or are aware of the responding aircraft's intended maneuvers. Continue to provide control instructions, safety alerts, and traffic advisories as appropriate to such aircraft.

NOTE–
When notified by the pilot of an RA, the controller is not prohibited from issuing traffic advisories and safety alerts.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–6, Safety Alert.
FAA Order JO 7110.65, Para 2–1–21, Traffic Advisories.

c. Once the responding aircraft has begun a maneuver in response to an RA, the controller is not

responsible for providing approved separation between the aircraft that is responding to an RA and any other aircraft, airspace, terrain or obstructions. Responsibility for approved separation resumes when one of the following conditions are met:

1. The responding aircraft has returned to its assigned altitude, or

2. A crew member informs you that the TCAS maneuver is completed and you observe that approved separation has been reestablished, or

3. The responding aircraft has executed an alternate clearance and you observe that approved separation has been reestablished.

NOTE–
1. *AC 120–55, Air Carrier Operational Approval and Use of TCAS II, suggests pilots use the following phraseology to notify controllers during TCAS events. When a TCAS RA may affect an ATC clearance, inform ATC when beginning the maneuver, or as soon as workload permits.*

EXAMPLE–
1. *"New York Center, United 321, TCAS RA."*

NOTE–
2. *When the RA has been resolved, the flight crew should advise ATC they are returning to their previously assigned clearance or subsequent amended clearance.*

EXAMPLE–
2. *"New York Center, United 321, clear of conflict, returning to assigned altitude."*

2–1–29. RVSM OPERATIONS

Controller responsibilities must include but not be limited to the following:

a. Non–RVSM aircraft operating in RVSM airspace.

1. Ensure non-RVSM aircraft are not permitted in RVSM airspace unless they meet the criteria of excepted aircraft and are previously approved by the operations supervisor/CIC. The following aircraft are excepted: DOD, DOD-certified aircraft operated by NASA (T38, F15, F18, WB57, S3, and U2 aircraft only), MEDEVAC, manufacturer aircraft being flown for development/certification, and Foreign State aircraft. These exceptions are accommodated on a workload or traffic-permitting basis.

NOTE–
The operations supervisor/CIC is responsible for system acceptance of a non–RVSM aircraft beyond the initial sector–to–sector coordination following the pilot request to access the airspace. Operations supervisor/CIC responsibilities are defined in FAA Order JO 7210.3, Chapter 6, Section 9, Reduced Vertical Separation Minimum (RVSM).

2. Ensure sector–to–sector coordination for all non–RVSM aircraft operations within RVSM airspace.

3. Inform the operational supervisor/CIC when a non–RVSM exception flight is denied clearance into RVSM airspace or is removed from RVSM airspace.

b. Non–RVSM aircraft transitioning RVSM airspace.

Ensure that operations supervisors/CICs are made aware when non–RVSM aircraft are transitioning through RVSM airspace.

c. Apply appropriate separation standards and remove any aircraft from RVSM airspace that advises it is unable RVSM due to equipment while en route.

d. Use "negative RVSM" in all verbal ground–to–ground communications involving non–RVSM aircraft while cleared to operate within RVSM airspace.

EXAMPLE–
"Point out Baxter1 climbing to FL 360, negative RVSM."

e. For the following situations, use the associated phraseology:

1. To deny clearance into RVSM airspace.

PHRASEOLOGY–
"UNABLE CLEARANCE INTO RVSM AIRSPACE."

2. To request a pilot to report when able to resume RVSM.

PHRASEOLOGY–
"REPORT ABLE TO RESUME RVSM."

f. In the event of a change to an aircraft's RVSM eligibility, amend the RVSM qualifier ("W") in the ICAO equipment string in order to properly identify non–RVSM aircraft on the controller display.

NOTE–
Changing the equipment suffix instead of amending the equipment string may result in incorrect revisions to other ICAO qualifiers.

REFERENCE–
AIM, Para 5–1–9, International Flight Plan (FAA Form 7233–4) IFR Flights (For Domestic or International Flights).
AIM, TBL 5–1–4 Aircraft COM, NAV, and Approach Equipment Qualifiers.

g. ATC may allow aircraft to remain in RVSM airspace using reduced vertical separation minima after the loss of a transponder or Mode C altitude reporting.

NOTE–
In a transponder out situation, the aircraft's altitude–keeping capabilities required for flight in RVSM airspace should remain operational.

REFERENCE–
FAA Order JO 7110.65, Para 4–5–1, Vertical Separation Minima.
FAA Order JO 7110.65, Para 2–3–8, Aircraft Equipment Suffix.
14 CFR Section 91.215 ATC Transponder and Altitude Reporting Equipment and Use.
Advisory Circular AC 91–85B, Authorization of Aircraft and Operators for Flight in Reduced Vertical Separation Minimum (RVSM) Airspace.

2–1–30. TERRAIN AWARENESS WARNING SYSTEM (TAWS) ALERTS

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

b. Once the responding aircraft has begun a maneuver in response to TAWS alert, the controller is not responsible for providing approved separation between the aircraft that is responding to a TAWS alert and any other aircraft, airspace, terrain or obstructions. Responsibility for approved separation resumes when one of the following conditions are met:

1. The responding aircraft has returned to its assigned altitude, or

2. A crew member informs you that the TAWS maneuver is completed and you observe that approved separation has been reestablished, or

3. The responding aircraft has executed an alternate clearance and you observe that approved separation has been reestablished.

2–1–31. "BLUE LIGHTNING" EVENTS

Ensure that the supervisor/controller–in–charge (CIC) is notified of reports of possible human trafficking. These may be referred to as "Blue Lightning" events.

NOTE–
If the specific taxi route ends into a connecting taxiway with the same identifier (for example, taxiway "A" connects with Taxiway "A1") at the approach end of the runway, the connecting taxiway may be omitted from the clearance.

PHRASEOLOGY–
RUNWAY (number), TAXI VIA (route as necessary).

or

RUNWAY (number), TAXI VIA (route as necessary)(hold short instructions as necessary)."

EXAMPLE–
"Runway Three–Six Left, taxi via taxiway Alpha, hold short of taxiway Charlie."

or

"Runway Three–Six Left, taxi via Alpha, hold short of Charlie."

or

"Runway Three–Six Left, taxi via taxiway Alpha, hold short of Runway Two–Seven Right."

or

"Runway Three–Six Left, taxi via Charlie, cross Runway Two–Seven Left, hold short of Runway Two–Seven Right."

or

"Runway Three–Six Left, taxi via Alpha, Charlie, cross Runway One–Zero."

c. Issue a crossing clearance to aircraft for each runway their route crosses. An aircraft must have crossed a previous runway before another runway crossing clearance may be issued. At those airports where the taxi distance between runway centerlines is 1,300 feet or less, multiple runway crossings may be issued with a single clearance. The air traffic manager must submit a request to the appropriate Service Area Director of Air Traffic Operations and receive approval before authorizing multiple runway crossings.

NOTE–
Controllers should avoid crossing points that are not perpendicular or nearly perpendicular to the runway to be crossed, (for example, reverse high speed taxiways).

PHRASEOLOGY–
"Cross (runway) at(runway/taxiway), hold short of (runway)", or
Cross (runways) at (runway/taxiway).

EXAMPLE–
"Cross Runway One–Six Left at Taxiway Bravo, hold short of Runway One–Six Right."
"Cross Runway One–Six Left and Runway One–Six Right at Taxiway Bravo."

REFERENCE–
FAA Order JO 7210.3, Para 10–3–11 Multiple Runway Crossings.

d. When an aircraft/vehicle is instructed to "follow" traffic and requires a runway crossing, issue a runway crossing clearance in addition to the follow instructions and/or hold short instructions, as applicable.

EXAMPLE–
"Follow (traffic), cross Runway Two–Seven Right, at Taxiway Whiskey"

or

"Follow (traffic), cross Runway Two Seven–Right at Taxiway Whiskey, hold short of Runway Two–Seven Left."

e. Issue a crossing clearance to vehicles for each runway their route crosses. A vehicle must have crossed a previous runway before another runway crossing clearance may be issued.

NOTE–
A clearance is required for vehicles to operate on any active, inactive, or closed runway except for vehicles operating on closed runways in accordance with a Letter of Agreement (LOA).

f. Vehicles that have been issued a clearance onto a runway to conduct runway operations are authorized to cross intersecting runways, unless otherwise restricted. Issue hold short instructions as needed.

NOTE–
Vehicles should not normally use runways as transition routes to other parts of the airfield. These movements are not considered runway operations and the use of alternative routes is preferred.

g. Crossing of active runway(s) by aircraft/vehicle(s):

1. During departure operations, ensure that aircraft/vehicles intending to cross a runway do not cross the runway holding position markings until the controller visually observes the departure aircraft in a turn, or the departure aircraft has passed the point where the crossing aircraft/vehicle is located, regardless of altitude, unless authorized in FAA Or-

der JO 7110.65, paragraph 3–10–10, Altitude Restricted Low Approach.

REFERENCE–
AIM, Runway Position Holding Markings, Subpara 2–3–5a.
FAA Order 7110.65, Para 3–10–10, Altitude Restricted Low Approach.

2. During arrival operations, ensure the following:

(a) An aircraft/vehicle has completed crossing prior to the arriving aircraft crossing the landing threshold, or

REFERENCE–
P/CG Term – Clear of the Runway.

(b) A crossing aircraft/vehicle will not cross the runway holding position markings until the arrival has landed and either:

(1) The controller has confirmed by verbal commitment from the pilot that the arriving aircraft will exit the runway prior to the point at which the crossing is intended, or

(2) The controller visually observes the aircraft exiting the runway prior to the point at which the crossing is intended, or

(3) The arriving aircraft has passed the point at which the crossing is intended.

REFERENCE–
FAA Order JO 7110.65, Para 3–10–4, Intersecting Runway/Intersecting Flight Path Separation.
FAA Order JO 7210.3, Para 10–3–7, Land and Hold Short Operations (LAHSO).

h. Request a read back of runway hold short instructions when it is not received from the pilot/vehicle operator.

PHRASEOLOGY–
READ BACK HOLD INSTRUCTIONS.

EXAMPLE–
1. *"American Four Ninety Two, Runway Three Six Left, taxi via taxiway Charlie, hold short of Runway Two Seven Right."*

or

"American Four Ninety Two, Runway Three Six Left, taxi via Charlie, hold short of Runway Two Seven Right."

"American Four Ninety Two, Roger."

"American Four Ninety Two, read back hold instructions."

2. *"Cleveland Tower, American Sixty Three is ready for departure."*

"American Sixty Three, hold short of Runway Two Three Left, traffic one mile final."

"American Sixty Three, Roger."

"American Sixty Three, read back hold instructions."

3. *"OPS Three proceed via taxiway Charlie hold short of Runway Two Seven."*

or

"OPS Three proceed via Charlie hold short of Runway Two Seven."

"OPS Three, Roger."

"OPS Three, 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.

i. Issue progressive taxi/ground movement instructions when:

1. A pilot/operator requests.

2. The specialist deems it necessary due to traffic or field conditions, e.g., construction or closed taxiways.

3. Necessary during reduced visibility, especially when the taxi route is not visible from the tower.

NOTE–
Progressive instructions may include step–by–step directions and/or directional turns.

REFERENCE–
FAA Order JO 7110.65, Para 3–7–4, Runway Proximity.
FAA Order JO 7110.65, Para 3–11–1, Taxi and Ground Movement Operation.

j. Issue instructions to expedite a taxiing aircraft or a moving vehicle.

PHRASEOLOGY–
TAXI WITHOUT DELAY (traffic if necessary).

EXIT/PROCEED/CROSS (runway/taxiway) at (runway/taxiway) WITHOUT DELAY.

k. Issue instructions to aircraft/vehicle to hold short of an approach/departure hold area when required.

PHRASEOLOGY–
HOLD SHORT OF (runway) APPROACH

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]

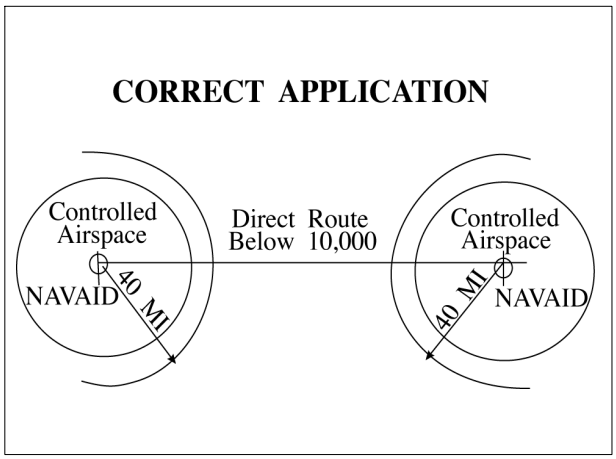
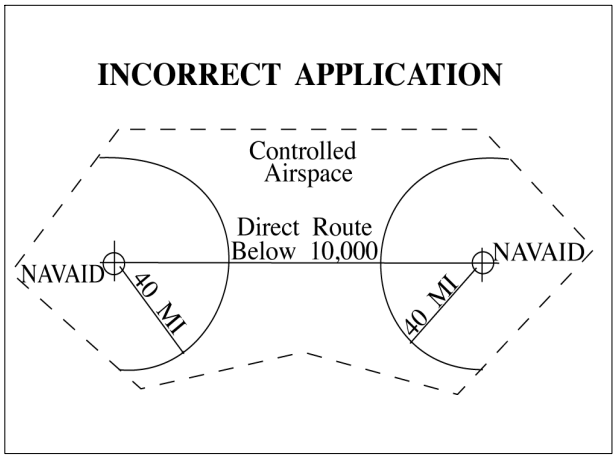


FIG 4–1–2
Application of Altitude and Distance Limitations [Application 2]



4–1–2. EXCEPTIONS

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

a. 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 5–1–6, 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

Section 2. Clearances

4–2–1. CLEARANCE ITEMS

Issue the following clearance items, as appropriate, in the order listed below:

a. Aircraft identification.

b. Clearance limit.

1. When the clearance limit is an airport, the word "airport" must follow the airport name.

PHRASEOLOGY–
CLEARED TO (destination) AIRPORT.

2. When the clearance limit is a NAVAID, and the NAVAID type is known, the type of NAVAID must follow the NAVAID name.

PHRASEOLOGY–
CLEARED TO (NAVAID name and type).

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).

c. Standard Instrument Departure (SID) or vectors, where applicable.

d. Route of flight including ADR/ADAR/AAR when applied.

e. Altitude data in the order flown.

f. Mach number, if applicable.

g. *USAF.* When issuing a clearance to an airborne aircraft containing an altitude assignment, do not include more than one of the following in the same transmission:

1. Frequency change.

2. Transponder change.

3. Heading.

4. Altimeter setting.

5. Traffic information containing an altitude.

h. Holding instructions.

i. Any special information.

j. Frequency and beacon code information.

REFERENCE–
FAA Order JO 7110.65, Para 4–2–8, IFR–VFR and VFR–IFR Flights.
FAA Order JO 7110.65, Para 4–5–7, Altitude Information.

4–2–2. CLEARANCE PREFIX

a. Prefix a clearance, information, or a request for information which will be relayed to an aircraft through a non–ATC facility by stating "A–T–C clears," "A–T–C advises," or "A–T–C requests."

b. Flight service stations and ARTCC Flight Data Units must prefix a clearance with the appropriate phrase: "ATC clears," "ATC advises," etc.

4–2–3. DELIVERY INSTRUCTIONS

Issue specific clearance delivery instructions, if appropriate.

4–2–4. CLEARANCE RELAY

Relay clearances verbatim.

REFERENCE–
FAA Order JO 7110.65, Para 10–4–4, Communications Failure.

4–2–5. ROUTE OR ALTITUDE AMENDMENTS

a. Amend route of flight in a previously issued clearance by one of the following:

1. State which portion of the route is being amended and then state the amendment.

PHRASEOLOGY–
CHANGE (portion of route) TO READ (new portion of route).

2. State the amendment to the route and then state that the rest of the route is unchanged.

PHRASEOLOGY–
(Amendment to route), REST OF ROUTE UNCHANGED.

3. Issue a clearance "direct" to a point on the previously issued route.

PHRASEOLOGY–
CLEARED DIRECT (fix,waypoint).
Or
CLEARED DIRECT (destination) AIRPORT.

NOTE–
Clearances authorizing "direct" to a point on a previously issued route do not require the phrase "rest of route unchanged." However, it must be understood where the

previously cleared route is resumed. When necessary, "rest of route unchanged" may be used to clarify routing.

4. Issue the entire route by stating the amendment.

EXAMPLE–
(Cessna 21A has been cleared to the Airville Airport via V41 Delta VOR V174 Alfa VOR, direct Airville Airport, maintain 9000. After takeoff, the aircraft is rerouted via V41 Frank intersection, V71 Delta VOR, V174 Alfa VOR. The controller issues one of the following as an amended clearance):

1. *"Cessna Two One Alfa change Victor Forty–One Delta to read Victor Forty–One Frank, Victor Seventy–One Delta."*

2. *"Cessna Two One Alfa cleared via Victor Forty–One Frank, Victor Seventy–One Delta, rest of route unchanged."*

3. *"Cessna Two One Alfa cleared via Victor Forty–One Frank, Victor Seventy–One Delta, Victor One Seventy–Four Alfa V–O–R, direct Airville airport, maintain Niner Thousand."*

b. When route or altitude in a previously issued clearance is amended, restate all applicable altitude restrictions.

EXAMPLE–
1. *(A departing aircraft is cleared to cross Ollis intersection at or above 3,000; Gordonsville VOR at or above 12,000; maintain FL 200. Shortly after departure the altitude to be maintained is changed to FL 240. Because altitude restrictions remain in effect, the controller issues an amended clearance as follows):*

"Amend altitude. Cross Ollis intersection at or above Three Thousand; cross Gordonsville V–O–R at or above One Two Thousand; maintain Flight Level Two Four Zero."

(Shortly after departure, altitude restrictions are no longer applicable, the controller issues an amended clearance as follows):

"Climb and maintain Flight Level Two Four Zero."

2. *(An aircraft is cleared to climb via a SID with published altitude restrictions. Shortly after departure the top altitude is changed to FL 230 and compliance with the altitude restrictions is still required, the controller issues an amended clearance as follows):*

"Climb via SID except maintain Flight Level Two Three Zero."

NOTE–
1. *Restating previously issued altitude to "maintain" is an amended clearance. If altitude to "maintain" is changed or restated, whether prior to departure or while airborne and previously issued altitude restrictions are omitted, altitude restrictions are canceled, including SID/STAR altitude restrictions if any.*

2. *Crossing altitudes and speed restrictions on Obstacle Departure Procedure/s (ODP/s) cannot be canceled or amended by ATC.*

c. Issue an amended clearance if a speed restriction is declined because it cannot be complied with concurrently with a previously issued altitude restriction.

EXAMPLE–
(An aircraft is cleared to cross Gordonsville VOR at 11,000. Shortly thereafter he/she is cleared to reduce his/her airspeed to 300 knots. The pilot informs the controller he/she is unable to comply with both clearances simultaneously. The controller issues an amended clearance as follows):

"Cross Gordonsville VOR at One One Thousand. Then, reduce speed to Three Zero Zero."

NOTE–
The phrase "do the best you can" or comparable phrases are not valid substitutes for an amended clearance with altitude or speed restrictions.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–18, Operational Requests.
FAA Order JO 7110.65, Section 6, Vectoring, Para 5–6–2, Methods.
FAA Order JO 7110.65, Section 7, Speed Adjustment, Para 5–7–2, Methods.

d. Air traffic control specialists should avoid route and/or altitude changes for aircraft participating in the North American Route Program (NRP) and that are displaying "NRP" in the remarks section of their flight plan.

NOTE–
Air traffic control specialists retain the latitude necessary to tactically resolve conflicts. Every effort should be made to ensure the aircraft is returned to the original filed flight plan/altitude as soon as conditions warrant.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–4, Operational Priority.
FAA Order JO 7110.65, Para 2–2–15, North American Route Program (NRP) Information.
FAA Order JO 7110.65, Para 2–3–2, En Route Data Entries.
FAA Order JO 7210.3, Chapter 18, Section 17, North American Route Program.

Section 3. Departure Procedures

4–3–1. DEPARTURE TERMINOLOGY

Avoid using the term "takeoff" except to actually clear an aircraft for takeoff or to cancel a takeoff clearance. Use such terms as "depart," "departure," or "fly" in clearances when necessary.

REFERENCE–
FAA Order JO 7110.65, Para 3–9–9, Takeoff Clearance.
FAA Order JO 7110.65, Para 3–9–11, Cancellation of Takeoff Clearance.

4–3–2. DEPARTURE CLEARANCES

Include the following items in IFR departure clearances:

NOTE–
When considered necessary, controllers or pilots may initiate read backs of a clearance. Some pilots may be required by company rule to do so.

a. Always include the airport of departure when issuing a departure clearance for relay to an aircraft by an FSS, dispatcher, etc.

b. Clearance Limit.

1. Specify the destination airport when practicable, even though it is outside controlled airspace. Issue short range clearances as provided for in any procedures established for their use.

(a) When the clearance limit is an airport, the word "airport" must follow the airport name.

PHRASEOLOGY–
CLEARED TO (destination) AIRPORT

(b) When the clearance limit is a NAVAID and the NAVAID type is known, the type of NAVAID must follow the NAVAID name.

PHRASEOLOGY–
CLEARED TO (NAVAID name and type)

(c) When the clearance limit is an intersection or waypoint and the type is known, the type must follow the intersection or waypoint name.

PHRASEOLOGY–
CLEARED TO (intersection or waypoint name and type)

2. For Air Force One (AF1) operations, do not specify the destination airport.

NOTE–
Presidential detail is responsible for ensuring the accuracy of the destination airport.

PHRASEOLOGY–
DESTINATION AS FILED.

c. Departure Procedures.

1. Specify direction of takeoff/turn or initial heading to be flown after takeoff as follows:

(a) Locations with Airport Traffic Control Service–Specify direction of takeoff/turn or initial heading as necessary, consistent with published:

(1) Departure Procedures (DP). If an aircraft is vectored off a published Standard Instrument Departure (SID) or Obstacle Departure Procedure (ODP), that vector cancels the DP and ATC becomes responsible for separation from terrain and /or obstructions. IFR aircraft must be assigned an altitude.

(2) Diverse Vector Areas (DVA). The assignment of an initial heading using a DVA can be given to the pilot as part of the initial clearance, but must be given no later than with the takeoff clearance. Once airborne, an aircraft assigned headings within the DVA can be vectored below the MVA/MIA. Controllers cannot interrupt an aircraft's climb in the DVA until the aircraft is at or above the MVA/MIA.

NOTE–
1. *It is important for controllers to understand that there can be differences in published climb gradients applicable to individual departure procedures serving the same airport or runway. Assigning a different departure procedure without the pilot being able to re–brief may result in the pilot rejecting the new procedure.*

2. *When a departure clearance includes a SID, concurrent use of a diverse vector area (DVA) is not permitted.*

REFERENCE–
AIM, Para 5–2–7, Departure Control.
AIM, Para 5–2–9, Instrument Departure Procedures (DP) – Obstacle Departure Procedures (ODP) and Standard Instrument Departures (SID).

(b) Locations without Airport Traffic Control Service, but within a Class E surface area – specify direction of takeoff/turn or initial heading if necessary. Obtain/solicit the pilot's concurrence concerning a turn or heading before issuing them in a clearance.

NOTE–
Direction of takeoff and turn after takeoff can be obtained/solicited directly from the pilot, or relayed by an FSS, dispatcher, etc., as obtained/solicited from the pilot.

(c) At all other airports– Do not specify direction of takeoff/turn after takeoff. If necessary to specify an initial heading to be flown after takeoff, issue the initial heading so as to apply only within controlled airspace.

2. Where an ODP has been published for a location and pilot compliance is necessary to ensure separation, include the procedure as part of the ATC clearance. Additionally, when an ODP is included in the clearance and the Visual Climb over Airport (VCOA) is requested by the pilot or assigned by ATC when it is the only procedure published in the ODP, include an instruction to remain within the published visibility of the VCOA.

EXAMPLE–
"Depart via the (airport name)(runway number) obstacle departure procedure. Remain within (number of miles) miles of the (airport name) during visual climb" if applicable. Or,
"Depart via the (graphic ODP name) obstacle departure procedure. Remain within (number of miles) miles of the (airport name) during visual climb" if applicable.

NOTE–
1. *Pilots will advise ATC of their intent to use the VCOA option when requesting their IFR clearance.*

2. *Some aircraft are required by 14 CFR 91.175 to depart a runway under IFR using the ODP absent other instructions from ATC.*

3. *IFR takeoff minimums and obstacle departure procedures are prescribed for specific airports/runways and published in either a textual, or graphic form with the label (OBSTACLE) in the procedure title, and documented on an appropriate FAA Form 8260. To alert pilots of their existence, instrument approach procedure charts are annotated with a symbol:*

3. Compatibility with a procedure issued may be verified by asking the pilot if items obtained/solicited will allow him/her to comply with local traffic pattern, terrain, or obstruction avoidance.

PHRASEOLOGY–
FLY RUNWAY HEADING.

DEPART (direction or runway).

TURN LEFT/RIGHT.

WHEN ENTERING CONTROLLED AIRSPACE (instruction), FLY HEADING (degrees) UNTIL REACHING (altitude, point, or fix) BEFORE PROCEEDING ON COURSE.

FLY A (degree) BEARING/AZIMUTH FROM/TO (fix) UNTIL (time),

or

UNTIL REACHING (fix or altitude),

and if required,

BEFORE PROCEEDING ON COURSE.

EXAMPLE–
"Verify right turn after departure will allow compliance with local traffic pattern,"or "Verify this clearance will allow compliance with terrain or obstruction avoidance."

NOTE–
If a published IFR departure procedure is not included in an ATC clearance, compliance with such a procedure is the pilot's prerogative.

4. SIDs:

(a) Assign a SID (including transition if necessary). Assign an ADR/ADAR, when applicable or the route filed by the pilot, when a SID is not established for the departure route to be flown, or the pilot has indicated that he/she does not wish to use a SID.

NOTE–
Departure procedure descriptive text contained within parentheses (for example, "Jimmy One (RNAV) Departure") is not included in departure clearance phraseology.

PHRASEOLOGY–
(SID name and number) DEPARTURE.

(SID name and number) DEPARTURE, (transition name) TRANSITION.

EXAMPLE–
"Stroudsburg One Departure."
"Stroudsburg One Departure, Sparta Transition."

NOTE–
If a pilot does not wish to use a SID issued in an ATC clearance, or any other SID published for that location, he/she is expected to advise ATC.

(b) If it is necessary to assign a crossing altitude which differs from the SID altitude emphasize the change to the pilot.

PHRASEOLOGY–
(SID name and number) DEPARTURE, EXCEPT CROSS (revised altitude information).

EXAMPLE–
"Stroudsburg One Departure, except cross Quaker at 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, Para 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 niner 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, Para 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 paragraph 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 Hutchinson 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 9–2–14, Military Operations Above FL 600.

4–3–4. DEPARTURE RELEASE, HOLD FOR RELEASE, RELEASE TIMES, DEPARTURE RESTRICTIONS, AND CLEARANCE VOID TIMES

Assign departure restrictions, clearance void times, or release times to separate departures from other traffic or to restrict or regulate the departure flow. Departures from an airport without an operating control tower must be issued either a departure release, a hold for release, or a release time.

REFERENCE–
FAA Order JO 7110.65, Para 10–3–1, Overdue Aircraft.
FAA Order JO 7110.65, Para 10–4–1, Traffic Restrictions.
FAA Order JO 7110.65, Para 10–4–3, Traffic Resumption.

a. Departure Release. When conditions allow, release the aircraft as soon as possible.

PHRASEOLOGY–
To another controller,
(aircraft identification) RELEASED.

To a flight service specialist, or Flight Data Communication Specialist (FDCS).

ADVISE (aircraft identification) RELEASED FOR DEPARTURE.

To a pilot at an airport without an operating control tower,
(aircraft identification) RELEASED FOR DEPARTURE.

b. Hold For Release (HFR).

1. "Hold for release" instructions must be used to inform a pilot or a controller that a departure clearance is not valid until additional instructions are received.

REFERENCE–
P/CG Term – Hold for Release.

2. When issuing hold for release instructions, include departure delay information.

PHRASEOLOGY–
(aircraft identification) HOLD FOR RELEASE, EXPECT (time in hours and/or minutes) DEPARTURE DELAY.

c. Release Times.

1. Release times must be issued to pilots when necessary to specify the earliest time an aircraft may depart.

NOTE–
A release time is a departure restriction issued to a pilot (either directly or through authorized relay) to separate a departing aircraft from other traffic.

2. The facility issuing a release time to a pilot must issue a time check. A release time using a specified number of minutes does not require a time check.

PHRASEOLOGY–
(aircraft identification) RELEASED FOR DEPARTURE AT (time in hours and/or minutes),

and if required,

IF NOT OFF BY (time), ADVISE (facility) NOT LATER THAN (time) OF INTENTIONS.

TIME (time in hours, minutes, and nearest quarter minute).

(aircraft identification) RELEASED FOR DEPARTURE IN (number of minutes) MINUTES

and if required,

IF NOT OFF IN (number of minutes) MINUTES, ADVISE (facility) OF INTENTIONS WITHIN (number of minutes) MINUTES.

d. When expect departure clearance times (EDCT) are assigned through traffic management programs, excluding overriding call for release (CFR) operations as described in subparagraph e, the departure terminal must, to the extent possible, plan ground movement of aircraft destined to the affected airport(s) so that flights are sequenced to depart no earlier than 5 minutes before, and no later than 5 minutes after the EDCT. Do not release aircraft on their assigned EDCT if a ground stop (GS) applicable to that aircraft is in effect, unless approval has been received from the originator of the GS.

e. Call for Release (CFR). When CFR is in effect, release aircraft so they are airborne within a window that extends from 2 minutes prior and ends 1 minute after the assigned time, unless otherwise coordinated.

NOTE–
1. *Subparagraph e applies to all facilities.*

2. *Coordination may be verbal, electronic, or written.*

1. If an aircraft has begun to taxi or requests taxi in a manner consistent with meeting the EDCT, the aircraft must be released. Additional coordination is not required.

2. If an aircraft requests taxi or clearance for departure inconsistent with meeting the EDCT window, ask the pilot to verify the EDCT.

(a) If the pilot's EDCT is the same as the FAA EDCT, the aircraft is released consistent with the EDCT.

(b) If the pilot's EDCT is not the same as the FAA EDCT, refer to Trust and Verify note below.

3. If an aircraft requests taxi too late to meet the EDCT, contact the ATCSCC through the appropriate TMU.

NOTE–
(Trust & Verify) EDCTs are revised by Air Carriers and Traffic Management for changing conditions en route or at affected airport(s). Terminal controllers' use of aircraft reported EDCT for departure sequencing should be verified with the appropriate TMU prior to departure if this can be accomplished without the aircraft incurring delay beyond the EDCT reported by the aircraft. The preferred method for verification is the Flight Schedule Monitor (FSM). If the EDCT cannot be verified without incurring additional delay, the aircraft should be released based on the pilot reported EDCT. The aircraft operator is responsible for operating in a manner consistent to meet the EDCT.

f. Clearance Void Times.

1. When issuing clearance void times at airports without an operating control tower, provide alternative instructions requiring the pilots to advise ATC of their intentions no later than 30 minutes after the clearance void time if not airborne.

2. The facility delivering a clearance void time to a pilot must issue a time check. A void time issued using a specified number of minutes does not require a time check.

NOTE–
If the clearance void time expires, it does not cancel the departure clearance or IFR flight plan. It withdraws the pilot's authority to depart IFR until a new departure release/release time has been issued by ATC and acknowledged by the pilot.

PHRASEOLOGY–
CLEARANCE VOID IF NOT OFF BY (clearance void time),

and if required,
IF NOT OFF BY (clearance void time), ADVISE (facility) NOT LATER THAN (time) OF INTENTIONS.

TIME (time in hours, minutes, and the nearest quarter minute).

Or

CLEARANCE VOID IF NOT OFF IN (number of minutes) MINUTES

and if required,

IF NOT OFF IN (number of minutes) MINUTES, ADVISE (facility) OF INTENTIONS WITHIN (number of minutes) MINUTES.

4–3–5. GROUND STOP

Do not release an aircraft if a ground stop (GS) applicable to that aircraft is in effect, without the approval of the originator of the GS.

4–3–6. DELAY SEQUENCING

When aircraft elect to take delay on the ground before departure, issue departure clearances to them in the order in which the requests for clearance were originally made if practicable.

4–3–7. FORWARD DEPARTURE DELAY INFORMATION

Inform approach control facilities and/or towers of anticipated departure delays.

4–3–8. COORDINATION WITH RECEIVING FACILITY

a. Coordinate with the receiving facility before the departure of an aircraft if the departure point is less than 15 minutes flying time from the transferring facility's boundary unless an automatic transfer of data between automated systems will occur, in which case, the flying time requirement may be reduced to 5 minutes or replaced with a mileage from the boundary parameter when mutually agreeable to both facilities.

NOTE–
Agreements requiring additional time are encouraged between facilities that need earlier coordination. However, when agreements establish mandatory radar handoff procedures, coordination needs only be effected in a timely manner prior to transfer of control.

REFERENCE–
FAA Order JO 7110.65, Chapter 5, Section 4, Transfer of Radar Identification, Para 5–4–1, Application.

b. The actual departure time or a subsequent strip posting time must be forwarded to the receiving facility unless assumed departure times are agreed upon and that time is within 3 minutes of the actual departure time.

4–3–9. VFR RELEASE OF IFR DEPARTURE

When an aircraft which has filed an IFR flight plan requests a VFR departure through a terminal facility, FSS, ARTCC Flight Data Unit, or air/ground communications station:

a. After obtaining, if necessary, approval from the facility/sector responsible for issuing the IFR clearance, you may authorize an IFR flight planned aircraft to depart VFR. Inform the pilot of the proper frequency and, if appropriate, where or when to contact the facility responsible for issuing the clearance.

PHRASEOLOGY–
VFR DEPARTURE AUTHORIZED. CONTACT (facility) ON (frequency) AT (location or time if required) FOR CLEARANCE.

b. If the facility/sector responsible for issuing the clearance is unable to issue a clearance, inform the pilot, and suggest that the delay be taken on the ground. If the pilot insists upon taking off VFR and obtaining an IFR clearance in the air, inform the facility/sector holding the flight plan of the pilot's intentions and, if possible, the VFR departure time.

4–3–10. FORWARDING DEPARTURE TIMES

TERMINAL

Unless alternate procedures are prescribed in a letter of agreement or automatic departure messages are being transmitted between automated facilities, forward departure times to the facility from which you received the clearance and also to the terminal departure controller when that position is involved in the departure sequence.

NOTE–
1. *Letters of agreement prescribing assumed departure times or mandatory radar handoff procedures are alternatives for providing equivalent procedures.*

2. *The letters "DM" flashing in the data block signify unsuccessful transmission of a departure message.*

Section 7. Arrival Procedures

4–7–1. CLEARANCE INFORMATION

Clear an arriving aircraft to a clearance limit by specifying the following:

a. Name of fix or airport.

PHRASEOLOGY–
CLEARED TO (destination) AIRPORT.
Or
CLEARED TO (NAVAID name and type if known).
Or
CLEARED TO (intersection or waypoint name and type if known).

b. Route of flight including a STAR/RNAV STAR/FMSP and STAR/RNAV STAR/FMSP transition, if appropriate. Assign a STAR/RNAV STAR/FMSP and STAR/RNAV STAR/FMSP transition to any aircraft in lieu of other routes; e.g., airways or preferential arrival routes when the routings are the same. The clearance must include the name and transition, if necessary, of the STAR/RNAV STAR/FMSP to be flown.

TERMINAL: When the STAR/RNAV STAR/FMSP transition is designed to provide course guidance to multiple runways, the facility must state intended runway number on initial contact, or as soon as practical. If the runway assignment, or any subsequent runway change, is not issued prior to 10 NM from the runway transition waypoint, radar vectors to final must be provided.

PHRASEOLOGY–
(STAR/RNAV STAR/FMSP name and number) ARRIVAL.
(STAR/RNAV STAR/FMSP name and number) ARRIVAL, (transition name) TRANSITION.
CHANGE/AMEND TRANSITION TO (runway number).
CHANGE/AMEND TRANSITION TO (runway number) TURN LEFT/RIGHT or HEADING (heading) FOR VECTOR TO FINAL APPROACH COURSE.

EXAMPLE–
"Rosewood One arrival."
"Rosewood One arrival, Delta transition."
"Change transition to Runway 09 right."
"Amend transition to Runway 22 left, turn right heading 180 for vector to final approach course."

NOTE–
1. *If a civil pilot does not wish to use a STAR issued in an ATC clearance or any other STAR published for that location, the pilot is expected to advise ATC.*

2. *Arrival procedure descriptive text contained within parentheses (for example, "Devine One (RNAV) Arrival") are not included in arrival clearance phraseology.*

c. Altitude instructions, as follows:

1. Assigned altitude; or

2. Instructions to vertically navigate on the STAR/FMSP or STAR/FMSP transition.

EXAMPLE–
"Bayview Three Arrival, Helen Transition, maintain Flight Level Three Three Zero."
"Descend via the Civit One Arrival."
"Descend via the Lendy One Arrival, Runway 22 left."

"Cross JCT at Flight Level Two Four Zero."
"Descend via the Coast Two Arrival."
"Civit One Arrival, Descend and Maintain Flight Level Two Four Zero."

REFERENCE–
FAA Order JO 7110.65, Para 4–5–7, Altitude Information.
AIM, Para 5–4–1, Standard Terminal Arrival (STAR) Procedures.

d. Issue holding instructions, EFC, and additional delay information as required.

e. Instructions regarding further communications as appropriate.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–17, Radio Communications.

4–7–2. ADVANCE DESCENT CLEARANCE

EN ROUTE

Take the following action when exercising control of aircraft landing at an airport located in an adjacent center's control area near the common boundary:

a. Coordinate with the receiving facility for a lower altitude and issue a clearance to the aircraft as appropriate.

b. Initiate this action at a distance sufficient from destination to allow for normal descent and speed reduction.

4–7–3. SINGLE FREQUENCY APPROACHES (SFA)

TERMINAL

Where SFA procedures for military single-piloted turbojet aircraft on an IFR flight plan are contained in

a letter of agreement, do not require a radio frequency change after the aircraft begins approach or after initial contact during an en route descent until a landing or low approach has been completed except under the following conditions:

REFERENCE–
FAA Order JO 7610.4, Special Operations, Para 9–3–6, Single Frequency Approach (SFA).
P/CG Term – Single-Piloted Aircraft.

a. During daylight hours while the aircraft is in VFR conditions.

b. On pilot request.

c. When pilot cancels IFR flight plan.

d. In an emergency situation.

e. When aircraft is cleared for visual approach.

4–7–4. RADIO FREQUENCY AND RADAR BEACON CHANGES FOR MILITARY AIRCRAFT

When military single-piloted turbojet aircraft will conduct an approach wholly or partly in IFR conditions or at night, take the following action:

NOTE–
It is known that the mental distraction and the inadvertent movement of aircraft controls resulting from the pilot's turning, reaching, or leaning to change frequencies can induce spatial disorientation (vertigo).

a. Avoid radio frequency and radar beacon changes to the maximum extent that communications capabilities and traffic will permit. However, when changes are required:

1. Give instructions early enough to allow the change before the aircraft reaches the approach fix or handoff point.

2. Keep frequency/radar beacon changes to a minimum below 2,500 feet above the surface.

3. Avoid requiring frequency/radar beacon changes during the time the aircraft is making a turn.

b. When traffic volume requires, a frequency other than the one used by aircraft making approaches may be assigned for use in transferring control to the approach control facility.

TERMINAL

c. If practicable, use a frequency common to both the GCA unit and approach control to minimize frequency changes.

d. When a GCA unit is not able to communicate on a common frequency, a change to a GCA frequency may be authorized.

e. When a nonradar approach will be made, aircraft may be instructed to change to tower frequency when:

1. The reported ceiling is at or above 1,500 feet and visibility is 5 statute miles or more.

2. The aircraft reports able to proceed by visual reference to the surface.

3. The aircraft requests and is cleared for a contact approach.

4. The aircraft is cleared for a visual approach.

f. Avoid making frequency/radar beacon changes after an aircraft begins a high altitude approach.

g. In the event of a missed approach, do not require a frequency/radar beacon change before the aircraft reaches the missed approach altitude, the MEA, or the MVA.

4–7–5. MILITARY TURBOJET EN ROUTE DESCENT

Provide military turbojet aircraft the same arrival procedures that are provided for nonmilitary turbojet aircraft except:

NOTE–
It is the responsibility of the pilot to request a high altitude approach if he/she does not want normal arrival handling.

a. An en route descent may be used in a nonradar environment; however, radar capability should exist which will permit the aircraft to be vectored to the final approach course of a published high altitude instrument approach procedure or PAR/ASR approach. Do not use this procedure if other than normal vectoring delays are anticipated.

b. Prior to issuance of a descent clearance below the highest initial approach fix altitude established for any high altitude instrument approach procedure for the destination airport inform the aircraft:

1. Type of approach to expect.

EXAMPLE–
"Expect V–O–R approach to runway three two."

altitude instrument approach procedure will be determined through coordination between the ATC facility concerned 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 90–66, Non–Towered Airport Flight Operations.

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. After an aircraft commences a missed approach, it may be vectored at or above the MVA/MIA, or follow the provisions of paragraph 5–6–3, Vectors Below Minimum Altitude.

NOTE–

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, Para 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, Para 5–1–17, Cold Temperature Operations.
AIM, Para 5–5–4, Instrument Approach.
AIM, Para 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

APPROACH APPROVED, NO SEPARATION SERVICES PROVIDED."

(c) Provide traffic information or advise the pilot to contact the appropriate facility.

4. If an altitude is assigned, including at or above/below altitudes, the altitude specified must meet MVA, minimum safe altitude, or minimum IFR altitude criteria.

REFERENCE–
FAA Order JO 7110.65, Para 7–7–5, Altitude Assignments.

5. All VFR aircraft must be instructed to maintain VFR on initial contact or as soon as possible thereafter.

NOTE–
This advisory is intended to remind the pilot that even though ATC is providing IFR-type instructions, the pilot is responsible for compliance with the applicable parts of the CFR governing VFR flight.

b. Missed Approaches.

1. Unless alternate instructions have been issued, IFR aircraft are automatically authorized to execute the missed approach depicted for the instrument approach being flown.

REFERENCE–
FAA Order JO 7110.65, Para 4–8–9, Missed Approach.

2. VFR aircraft are not automatically authorized to execute the missed approach procedure. This authorization must be specifically requested by the pilot and approved by the controller. When a missed approach has been approved and the practice approach is conducted in accordance with paragraph 4–8–11 a2, separation must be provided throughout the procedure including the missed approach. If the practice approach is conducted in accordance with paragraph 4–8–11 a3, separation services are not required during the missed approach.

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

4–8–12. LOW APPROACH AND TOUCH-AND-GO

Consider an aircraft cleared for a touch-and-go, low approach, or practice approach as an arriving aircraft until that aircraft touches down or crosses the landing threshold; thereafter, consider the aircraft as a departing aircraft. Before the aircraft begins its final descent, issue the appropriate departure instructions the pilot is to follow upon completion of the approach (in accordance with paragraph 4–3–2, Departure Clearances). Climb-out instructions must include a specific heading or a route of flight and altitude, except when the aircraft will maintain VFR and contact the tower.

EXAMPLE–
"After completing low approach, climb and maintain six thousand. Turn right, heading three six zero."

"Maintain VFR, contact tower."

(Issue other instructions as appropriate.)

NOTE–
Climb-out instructions may be omitted after the first approach if instructions remain the same.

Chapter 5. Radar

Section 1. General

5–1–1. PRESENTATION AND EQUIPMENT PERFORMANCE

a. Provide radar services 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 services 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.

b. Notify the OS/CIC of any radar malfunctions or unexpected outages. Advise adjacent 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 12 Section 6.

5–1–2. ATC SURVEILLANCE SOURCE USE

Use approved ATC Surveillance Sources.

REFERENCE–
FAA Order JO 7110.65, Para 5–2–13, 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 5–2–14, 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. *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 WAM cannot be used to provide 3 NM separation in the EAS. 3 NM targets are not derived from 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, Para 3–6–2, ATC Surveillance Source Use.

5–1–3. 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).

5–1–4. 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 subparagraph 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 subparagraph 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.

5–1–5. 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.

5–1–6. 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.
AC 90-100A, U.S. Terminal and En Route Area Navigation (RNAV) Operations, Para 8a. Navigation System Accuracy.

5–1–7. MANUAL FIX POSTING

EN ROUTE

Manually record the observed or reported time over a fix at least once for each controlled aircraft in your sector of responsibility 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.

5–1–8. 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.

5–1–9. 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 paragraph 5–9–7, Simultaneous Independent Approaches–Dual & Triple.*

2. *Termination of radar monitoring where PAR equipment is used to monitor approaches is prescribed in paragraph 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.

3. At tower-controlled airports where radar coverage does not exist to within $^{1}/_{2}$ mile of the end

of the runway, arriving aircraft must be informed when radar service is terminated.

REFERENCE–
FAA Order JO 7210.3, Para 10–5–6, Radar Tolerances.

4. *TERMINAL*. An arriving VFR aircraft receiving radar service to a tower-controlled airport within Class B airspace, Class C airspace, TRSA, or where basic radar service is provided has landed, or to all other airports, is instructed to change to tower or advisory frequency.

5. *TERMINAL*. An aircraft completes a radar approach.

REFERENCE–
FAA Order JO 7110.65, Para 7–6–12, Service Provided When Tower is Inoperative.

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 beacon code is one of the required message elements of ADS–B Out.

b. Unless otherwise specified in this section, a facility directive, or a letter of agreement, issue beacon codes assigned by the computer. Computer–assigned codes may be modified as required.

NOTE–
The computer will assign only discrete beacon codes unless all the discrete codes allocated to a facility are in use.

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 facility's delegated airspace must be assigned a beacon code assigned by the ARTCC computer.

NOTE–
This will provide the adjacent facility advance information on the aircraft and will cause auto–acquisition of the aircraft prior to handoff. When an airborne 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, appropriate action should be taken to remove flight plan information on that aircraft.

PHRASEOLOGY–
SQUAWK THREE/ALFA (code),

or

SQUAWK (code).

REFERENCE–
FAA Order JO 7110.65, Para 5–3–3, Beacon/ADS–B Identification Methods.
FAA Order JO 7110.65, Para 5–3–4, Terminal Automation Systems Identification Methods.

c. Code 4000 should be assigned when aircraft are operating on a flight plan specifying frequent or rapid changes in assigned altitude in more than one stratum or other category of flight not compatible with a discrete 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 frequencies is not required and frequent altitude changes are approved, and other flights requiring special handling by ATC.*

2. *Military aircraft operating in restricted/warning areas or on VR routes will squawk 4000 unless another code has been assigned or coordinated with ATC.*

5–2–2. 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/ADS–B Identification Methods.

5–2–3. EMERGENCY CODE ASSIGNMENT

Assign codes to emergency aircraft as follows:

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

PHRASEOLOGY–
SQUAWK MAYDAY ON 7700.

NOTE–
Instead of displaying "7700" in the data block, ERAM will display "EMRG," and STARS/MEARTS will display "EM."

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 a computer–assigned discrete code.

NOTE–
1. *The code change, based on pilot concurrence, the nature of the emergency, and current flight conditions, will*

signify to other ATC 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 change transponder settings during an emergency.*

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

REFERENCE−
FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B 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.

5−2−4. RADIO FAILURE

When you observe a **Code 7600** display, apply the procedures in paragraph 10−4−4, Communications Failure.

NOTE−
1. *An aircraft experiencing a loss of two−way radio communications capability can be expected to squawk **Code 7600**.*

2. *Instead of displaying "7600" in the data block, ERAM will display "RDOF," and STARS/MEARTS will display "RF."*

REFERENCE−
FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B Identification Methods.

5−2−5. HIJACK/UNLAWFUL INTERFERENCE

When you observe a Code 7500 display, apply the procedures in paragraph 10−2−6, Hijacked Aircraft.

NOTE−
Instead of displaying "7500" in the data block, ERAM will display "HIJK," and STARS/MEARTS will display "HJ."

REFERENCE−
FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B Identification Methods.

5−2−6. UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK

Code 7400 may be transmitted 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:

NOTE−
Instead of displaying "7400" in the data block, ERAM will display "LLNK," and STARS/MEARTS will display "LL."

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 the OS/CIC, 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.*

5−2−7. VFR CODE ASSIGNMENTS

a. For VFR aircraft receiving radar advisories, issue a computer−assigned beacon code.

1. If the aircraft is outside of your area of responsibility and an operational benefit will be

gained by retaining the aircraft on your frequency for the purpose of providing services, ensure that coordination has been effected:

(a) As soon as possible after positive identification, and

(b) Prior to issuing a control instruction or providing a service other than a safety alert/traffic 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 an IFR aircraft that cancels its IFR flight plan and is not requesting radar advisory service, or a VFR aircraft for which radar advisory service is being terminated, to squawk VFR.

PHRASEOLOGY–
SQUAWK VFR.

or

SQUAWK 1200.

NOTE–
1. *Aircraft not in contact with ATC may squawk **1255** in lieu of **1200** while en route to/from or within designated firefighting areas.*

2. *VFR aircraft that 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. *VFR gliders 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 JO 7110.66, National Beacon Code Allocation Plan.

c. When an aircraft changes from VFR to IFR, 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/ADS–B Identification Methods.

5–2–8. BEACON CODES FOR PRESSURE SUIT FLIGHTS AND FLIGHTS ABOVE FL 600

Special use Mode 3/A codes are reserved for certain pressure suit flights and aircraft operations above FL 600 in accordance with FAA Order JO 7610.4, Special Operations.

a. Ensure that these flights remain on one of the special use codes if filed in the flight plan, except:

b. When unforeseen events cause more than one aircraft to be in the same or adjacent ARTCC's airspace at the same time on the same special use discrete code, if necessary, you may request the pilot to make a code change, squawk standby, or stop squawk as appropriate.

NOTE–
1. *Current FAA automation systems track multiple targets on the same beacon code with much greater reliability than their predecessors, and a code change may not be necessary for such flights.*

2. *The beacon code is often preset on the ground for such flights and is used throughout the flight profile, including operations below FL 600. Due to equipment inaccessibility, the flight crew may not be able to accept transponder changes identified in this subparagraph.*

3. *In case of emergency, Code 7700 can still be activated. Instead of displaying "7700" in the data block, ERAM will display "EMRG," and STARS/MEARTS will display "EM."*

REFERENCE–
FAA Order JO 7110.65, Para 5–3–3, Beacon/ADS–B Identification Methods.

5–2–9. 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/ADS–B Identification Methods.

5–2–10. 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/ADS–B Identification Methods.

5–2–11. CODE MONITOR

a. Continuously monitor the codes assigned to aircraft operating within your area of responsibility. Additionally, monitor **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. When your area of responsibility contains or is immediately adjacent to a restricted area, warning area, VR route, or other category where Code 4000 is appropriate, monitor **Code 4000** and any other code used in lieu of **4000**.

REFERENCE–
FAA Order JO 7210.3, Para 3–6–3, Monitoring of Mode 3/A Radar Beacon Codes.

5–2–12. 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/ADS–B Identification Methods.

5–2–13. 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 5–1–2, ATC Surveillance Source Use.
FAA Order JO 7110.65, Para 5–3–3, Beacon/ADS–B Identification Methods.

5–2–14. 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 5–1–2, ATC Surveillance Source Use.
FAA Order JO 7110.65, Para 5–3–3, Beacon/ADS–B Identification Methods.

5–2–15. 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 5−2−21, Altitude Filters.
FAA Order JO 7110.65, Para 5−14−5, Selected Altitude Limits.

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.

5−2−16. 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/ADS–B Identification Methods.

5–2–17. 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/ADS–B Identification Methods.

5–2–18. 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 5–2–15, Validation of Mode C Readout.
FAA Order JO 7110.65, Para 5–3–3, Beacon/ADS–B Identification Methods.
P/CG Term – Automatic Altitude Report.

5–2–19. 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/ADS–B Identification Methods.

5–2–20. 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/ADS–B Identification Methods.

5–2–21. 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 5–2–15, Validation of Mode C Readout, subparagraph c2 may be applied. Air traffic managers may authorize temporary suspension of this requirement when target clutter is excessive.

5–2–22. INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER

a. Except as provided in paragraph 5–2–24, 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.

5–2–23. 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.

5–2–24. 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 5–2–22, 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, subparagraphs 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 5–12–11, 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),

or, if aircraft's altitude reporting capability is turned off,

SQUAWK (4 digit discrete code), 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," 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/ADS–B 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/ADS–B 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).

Section 4. Transfer of Radar Identification

5–4–1. APPLICATION

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

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

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

REFERENCE–
FAA Order JO 7110.65, Para 4–3–8, Coordination with Receiving Facility.

5–4–2. TERMS

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

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

c. *Point Out.* An action taken by a controller to transfer the radar identification of an aircraft to another controller and radio communications will not be transferred.

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

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

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.

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

5–4–3. METHODS

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

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

2. Use landline voice communications.

3. Use automation capabilities.

NOTE–
Automated handoff capabilities are only available when FDP is operational.

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

REFERENCE–
FAA Order JO 7210.3, Para 12–6–4, Use of Stars Quick Look Functions.

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

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

EXAMPLE–
"Point out, Southwest of Richmond VOR . . .."

2. The aircraft identification, as follows:

(a) The aircraft call sign, or

(b) The discrete beacon code of the aircraft during interfacility point-outs only, if both the receiving and the transferring controllers agree.

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

(c) EN ROUTE. The Computer Identification Number (CID) during intrafacility point-outs.

EXAMPLE–
"Point Out, Southwest of Richmond VOR, C-I-D 123…"

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

NOTE–
When physically pointing to the target, you do not have to state the aircraft position.

4. Advise the receiving controller of pertinent information not contained in the data block or available flight data unless covered in an LOA or facility directive. Pertinent information may include:

(a) Assigned heading.

(b) Speed/altitude restrictions.

(c) Observed track or deviation from the last route clearance.

(d) Any other pertinent information.

PHRASEOLOGY–
HANDOFF/POINT–OUT/TRAFFIC (aircraft position), (aircraft ID or discrete beacon code), (altitude, restrictions, and other pertinent information, if applicable).

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

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

or

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

or

TRAFFIC OBSERVED,

or

UNABLE (appropriate information, as required).

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

REFERENCE–
FAA Order JO 7110.65, Para 5–2–15, Validation of Mode C Readout.

5–4–4. TRAFFIC

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

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

5–4–5. TRANSFERRING CONTROLLER HANDOFF

Unless otherwise coordinated or specified in an LOA or facility directive, the transferring controller must:

a. Complete a handoff prior to an aircraft entering the airspace delegated to the receiving controller.

b. Verbally obtain the receiving controller's approval prior to making any changes to an aircraft's flight path, altitude, speed, or data block information while the handoff is being initiated or after acceptance.

c. Advise the receiving controller of pertinent information not contained in the data block or flight progress strip, including:

1. Assigned heading.

2. Airspeed 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.

d. Initiate verbal coordination to verify the position of primary or nondiscrete targets, except for

5–4–9. PREARRANGED COORDINATION

Prearranged coordination allowing aircraft under your control to enter another controller's area of jurisdiction may only be approved provided procedures are established and published in a facility directive/LOA in accordance with FAA Order JO 7210.3, paragraph 3–6–6, Prearranged Coordination.

NOTE–
Under no circumstances may one controller permit an aircraft to enter another's airspace without proper coordination. Coordination can be accomplished by several means; i.e., radar handoff, automated information transfer, verbal, point–out, and by prearranged coordination procedures identified in a facility directive that clearly describe the correct application. Airspace boundaries should not be permitted to become barriers to the efficient movement of traffic. In addition, complete coordination, awareness of traffic flow, and understanding of each position's responsibility concerning penetration of another's airspace cannot be overemphasized.

REFERENCE–
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 7210.3, Para 3–6–6, Prearranged Coordination.

5–4–10. EN ROUTE FOURTH LINE DATA BLOCK USAGE

a. The fourth line of the data block must be displayed. When used for forwarding control information, only the specified messages listed in this section may be used. Any additional control information must be forwarded via other communications methods. Free text may be used by individual sector teams for recording information the team deems appropriate for managing the sector, but must be removed prior to initiation of identification transfer.

REFERENCE–
FAA Order JO 7110.65, Para 5–4–5, Transferring Controller Handoff, subpara b.
FAA Order JO 7110.65, Para 5–4–8, Automated Information Transfer (AIT).

b. The en route fourth line data block area must be used for coordination purposes only in association with radar identified aircraft.

c. When automated information transfer (AIT) procedures are applied, en route fourth line usage for transfer of control information must be specifically defined within facility AIT directive.

REFERENCE–
FAA Order JO 7110.65, Para 5–4–8, Automated Information Transfer (AIT).
FAA Order JO 7210.3, Para 4–3–8, Automated Information Transfer (AIT).

d. Coordination format for assigned headings must use the designation character "H" preceding a three–digit number.

EXAMPLE–
H080, H270

e. Aircraft assigned a heading until receiving a fix or joining a published route must be designated with assigned heading format followed by the fix or route.

EXAMPLE–
H080/ALB, 080/J121, PH/ALB

NOTE–
1. *The notation "PH" may be used to denote present heading.*

2. *The character "H" may be omitted as a prefix to the heading assignment only if necessary due to character field limitations, and it does not impede understanding.*

f. Coordination format for weather deviations must use the designated characters:
D-deviation
L-left
R-right
N-north
E-east
S-south
W-west
/F – direct next NAVAID/waypoint
D+2 headings – deviate between.

NOTE–
1. *Two digits specify turns in degrees and must include direction character(s). Three digits specify heading(s).*

2. *The inclusion of a /NAVAID, /waypoint, or /F indicates that the pilot has been authorized to deviate for weather and must rejoin the route at the next NAVAID, waypoint, or fix in the route of flight in accordance with the phraseology in paragraph 2–6–4.*

EXAMPLE–
D90/ATL, DL/KD75U, D090/F

3*. The absence of a NAVAID, waypoint, or /F indicates that 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 subparagraph 2–1–15c.*

EXAMPLE–
DN, D20L, D30R, D080+120

g. Coordination format for assigned airspeeds must use the designation character "S" preceding a three−digit number.

NOTE−
A "+" notation may be added to denote an assigned speed at or greater than the displayed value. A "−" notation may be added to denote an assigned speed at or less than the displayed value.

EXAMPLE−
S210, S250, S250+, S280−

h. Aircraft assigned a Mach number must use the designation "M" preceding the two−digit assigned value.

EXAMPLE−
M80, M80+, M80−

REFERENCE−
FAA Order JO 7110.65, Para 5−4−10, En Route Fourth Line Data Block Usage, subpara g NOTE.

i. Aircraft authorized to conduct celestial navigation training within 30 NM of the route centerline specified within the en route clearance.

EXAMPLE−
CELNAV

j. Coordination format for aircraft requesting an altitude change must use the designation characters "RQ" preceding a three−digit number.

EXAMPLE−
RQ170, RQ410

k. Coordination format for aircraft requesting a route change must use the designation "RQ/" preceding a specific fix identifier.

EXAMPLE−
RQ/LAX, RQ/NEUTO

l. The acceptance of a handoff by the receiving controller must constitute receipt of the information contained within the en route fourth line data block. 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. It is the responsibility of the receiving controller to advise the transferring controller if any information is not understood, or needs to be revised.

NOTE−
Due to system and character limitations the usage of these standardized entries may require additional support via facility directive in order to provide complete coordination.

m. All other control information must be coordinated via other methods.

NOTE–
Consider parallel runways less than 2,500 feet apart as a single runway because of the possible effects of wake turbulence.

1. Small behind large– *4 miles*.

2. Small behind heavy– *6 miles.*

If the landing threshold cannot be determined, apply the above minima as constant or increasing at the 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 5–2–15, 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 subparagraph 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 5–2–15, 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, subparagraph 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 9–2–13, Military Aerial Refueling.

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

c. *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.

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, subparagraph 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, subparagraph 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.

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

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

NOTE–
The additional separation provided in paragraph 5–5–8, Additional Separation for Formation Flights, is not normally added to wake turbulence separation when a formation is following a heavier aircraft since none of the formation aircraft are likely to be closer to the heavier aircraft than the lead aircraft (to which the prescribed wake turbulence separation has been applied).

REFERENCE–
FAA Order JO 7110.65, Para 9–2–13 , Military Aerial Refueling.

5–5–9. SEPARATION FROM OBSTRUCTIONS

a. TERMINAL. Separate aircraft from prominent obstructions depicted on the radar display by the following minima:

1. When less than 40 miles from the antenna– *3 miles.*

2. When 40 miles or more from the antenna– *5 miles.*

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

4. For single sensor ASR–11 MSSR Beacon, when less than 60 miles from the antenna – *3 miles.*

5. FUSION:

(a) Fusion target symbol – *3 miles*.

(b) When ISR is displayed – *5 miles*.

NOTE–
When operating in FUSION, distances from the antenna listed in paragraph 5–5–9, a1 through a4, do not apply.

b. TERMINAL. Vertical separation of aircraft above a prominent obstruction depicted on the radar display and contained within a buffer area may be discontinued after the aircraft has passed the obstruction.

c. EAS. Apply the radar separation minima specified in paragraph 5–5–4, Minima.

5–5–10. ADJACENT AIRSPACE

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

REFERENCE–
FAA Order JO 7110.65, Para 2–1–14 , Coordinate Use of Airspace.

1. When less than 40 miles from the antenna– *1 $^{1}/_{2}$ miles.*

2. When 40 miles or more from the antenna– *2 $^{1}/_{2}$ miles.*

3. *EAS:*

(a) Below Flight Level 600– *2 $^{1}/_{2}$ miles*.

(b) Flight Level 600 and above– *5 miles*.

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

1. When less than 40 miles from the antenna– *3 miles*.

2. When 40 miles or more from the antenna– *5 miles*.

3. *EAS:*

(a) Below Flight Level 600– *5 miles.*

(b) Flight Level 600 and above– *10 miles.*

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

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

5–5–11. EDGE OF SCOPE

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

a. When less than 40 miles from the antenna– *3 miles* from edge of scope.

b. When 40 miles or more from the antenna– *5 miles* from edge of scope.

c. *EAS:*

1. Below Flight Level 600– *5 miles*.

2. Flight Level 600 and above– *10 miles*.

5–5–12. BEACON TARGET DISPLACEMENT

When using a radar target display with a previously specified beacon target displacement to separate a beacon target from a primary target, adjacent airspace, obstructions, or terrain, add a 1 mile correction factor to the applicable minima. The maximum allowable beacon target displacement which may be specified by the facility air traffic manager is $^1/_2$ mile.

REFERENCE–
FAA Order JO 7210.3, Para 3–6–4, Monitoring of Mode 3/A Radar Beacon Codes.

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, radar departures, 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, 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, Para 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. TERMINAL. As described in facility directives, when vectoring a departing IFR aircraft, or one executing a missed approach, when ISR is not displayed in the full data block 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 one of the following:

1. 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, or;

2. 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, or;

3. Radar facilities may vector aircraft below the MVA/MIA, provided:

(a) No prominent obstacles are within 10 NM of the departure end of runway (DER).

(b) Aircraft must be allowed an uninterrupted climb to meet the MVA/MIA within 10 NM of the DER.

NOTE–
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 if issued go–around instructions, except after conducting a visual approach. ATC does not assume this responsibility when utilizing a Diverse Vector Area (DVA) or when operating on SIDs with or without a published range of headings in the departure route description.

b. After reaching the first MVA/MIA sector, all subsequent MVA/MIA sectors encountered must be met.

REFERENCE–
P/CG Term – Obstacle.
P/CG Term – Obstruction.
P/CG Term – Prominent Obstacle.

c. 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.

d. At those locations using radar SIDs, radar facilities may vector aircraft below the MVA/MIA, in accordance with facility directives.

e. At locations that vector aircraft conducting a go–around or missed approach, use authorized headings and display those prominent obstacles stipulated in facility directives until reaching the MVA/MIA.

REFERENCE–
FAA Order JO 7110.65, Para 5–8–1, Procedures.
FAA Order JO 7210.3, Para 3–8–5, Establishing Diverse Vector Area/s (DVA).
FAA Order JO 7210.3, Para 10–3–15, Go–Around/Missed Approach.

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.

(if required) EXCEPT (alternate instructions).

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.

Section 8. Radar Departures

5–8–1. PROCEDURES

a. When vectoring a departing aircraft on a radar SID, concurrent use of a diverse vector area (DVA) is not permitted.

b. When the departure route description on a radar SID contains the phrase, "Fly assigned heading," "as assigned by ATC," or similar phrases, with a published range of headings in the route description, assign headings or vectors as needed not to exceed those headings in the published range until reaching the MVA/MIA.

REFERENCE–
FAA Order JO 7110.65, Para 5–6–3, Vectors Below Minimum Altitude.

5–8–2. INITIAL HEADING

a. Before departure, assign the initial heading consistent with either a SID being flown or DVA, if applicable, when a departing aircraft is to be vectored immediately after takeoff. At locations that have a DVA, concurrent use of both a SID and DVA is not permitted.

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 if issued go–around instructions, except after conducting a visual approach. ATC does not assume this responsibility when utilizing a Diverse Vector Area (DVA) or when operating on SIDs with or without a published range of headings in the departure route description.*

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. At locations with both SIDs and DVAs, an amended departure clearance is required to cancel a previously assigned SID and subsequently utilize a DVA or vice versa. The amended clearance must be provided to the pilot in a timely manner so that the pilot may brief the changes in advance of entering the runway.

c. 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.

d. 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 proce-*

dures 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 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.)

FIG 5–8–1
Successive Departures

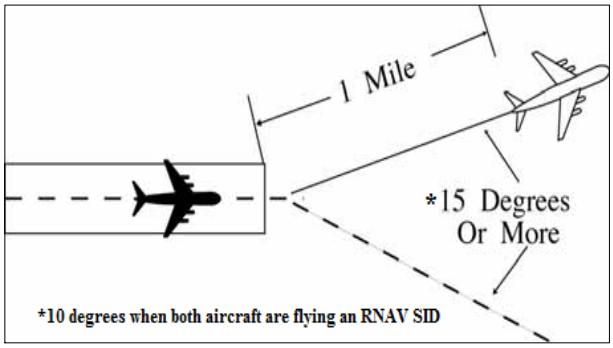


FIG 5–8–2
Simultaneous Departures

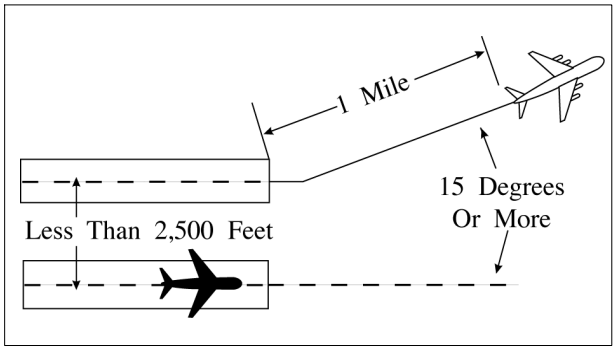
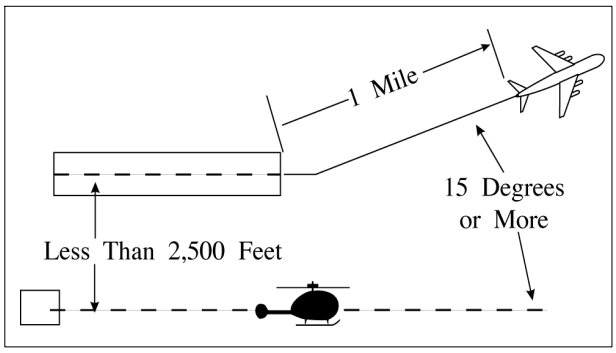


FIG 5–8–3
Simultaneous Departures



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

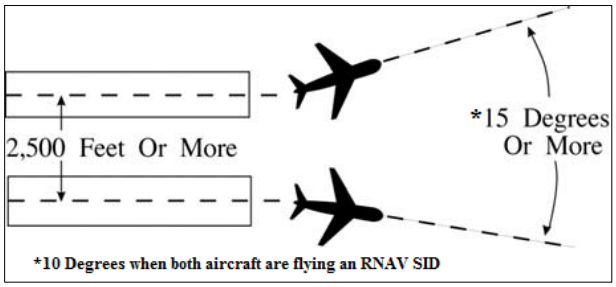
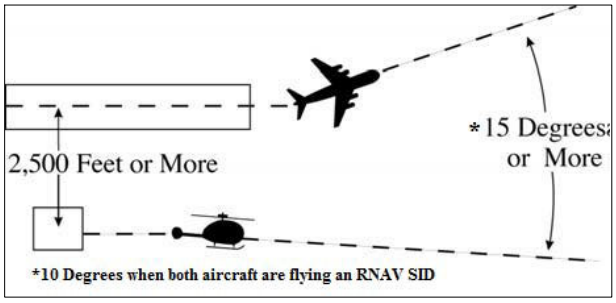


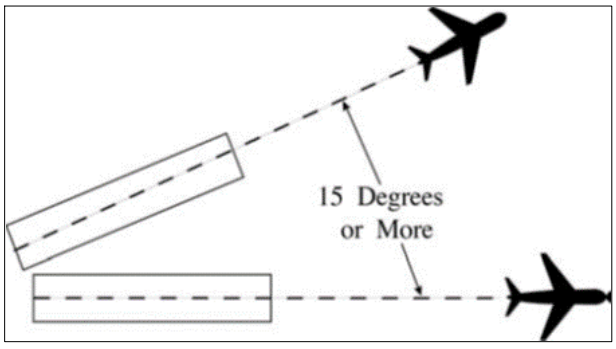
FIG 5–8–5
Parallel Helicopter Course Departures



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

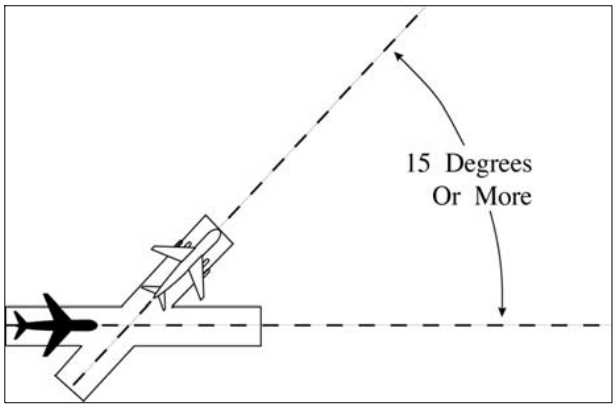
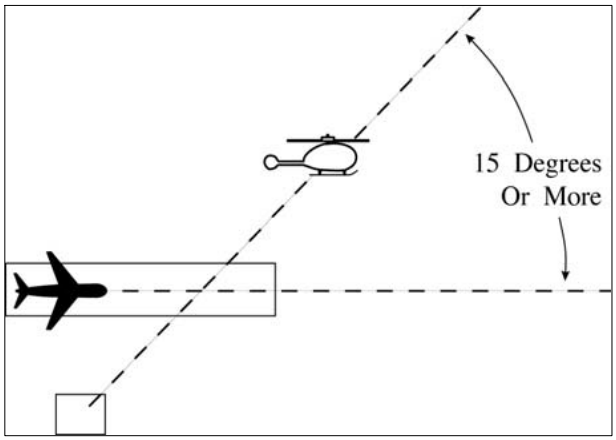


FIG 5–8–8
Intersecting Helicopter Course Departures



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

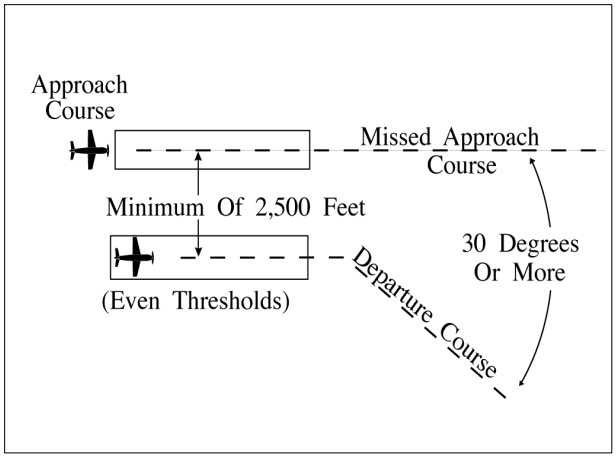
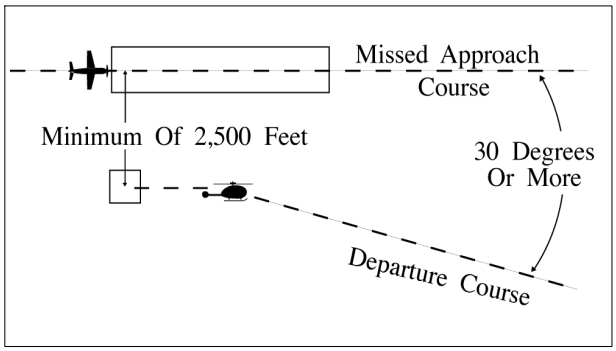


FIG 5–8–10
Parallel Thresholds are Even



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

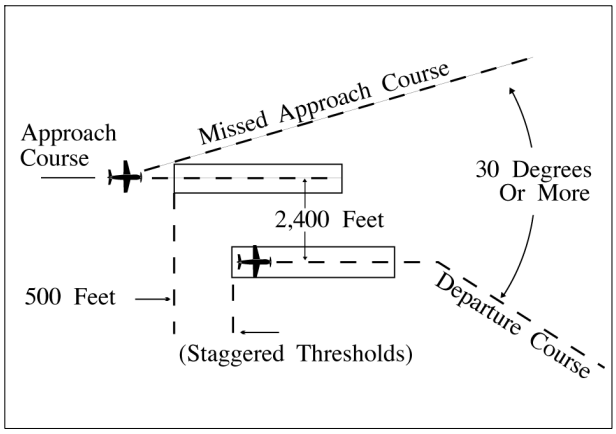
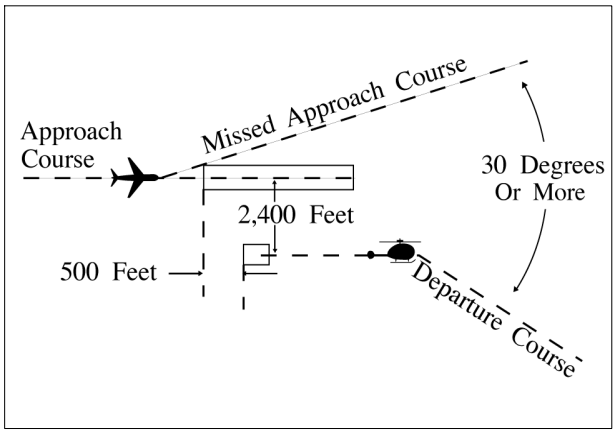


FIG 5–8–12
Parallel Thresholds are Staggered

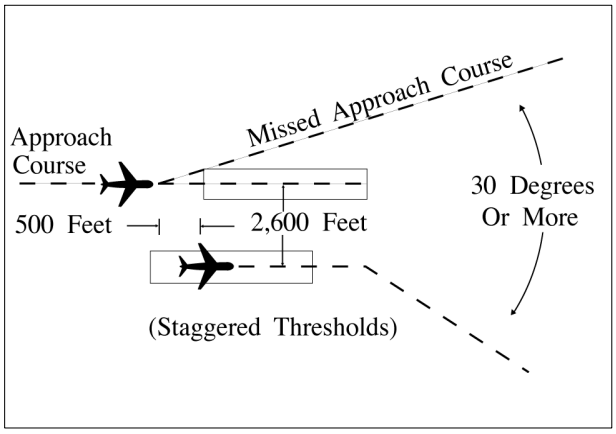


NOTE–
In the event of a missed approach by an aircraft requiring wake turbulence separation behind it, apply the procedures in paragraph 3–9–6, Same Runway Separation and/or paragraph 3–9–8, Intersecting Runway/Intersecting Flight Path Operations to ensure that the larger aircraft does not overtake or 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.

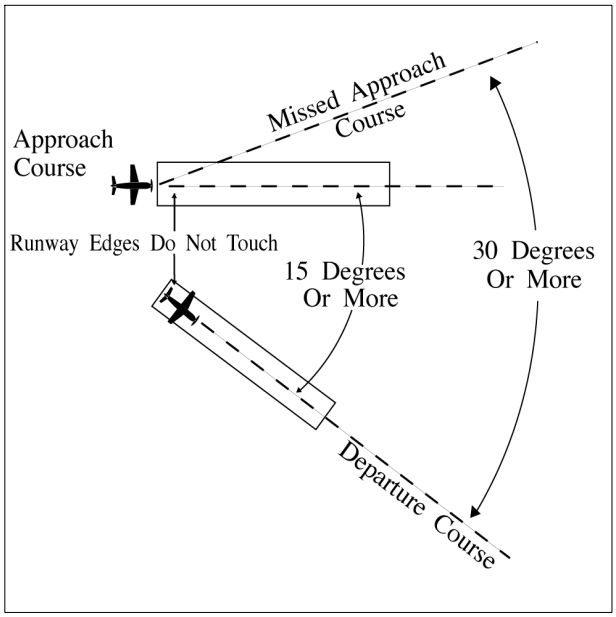
2. The arriving aircraft is approaching the farther runway: the runway centerlines separation exceeds 2,500 feet by at least 100 feet for each 500 feet the landing thresholds are staggered. (See FIG 5–8–13.)

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 subparagraphs a, b, or c.

REFERENCE–
FAA Order JO 7110.65, Para 5–8–4, Departure and Arrival.

PHRASEOLOGY–
TRAFFIC ALERT, (call sign), TURN (right/left) IMMEDIATELY HEADING (degrees), CLIMB/DESCEND 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 simultaneous independent approaches.

f. Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight when simultaneous independent approaches, or PRM approaches, if applicable, 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 approach in use.

REFERENCE–
FAA Order JO 7110.65, Para 5–1–9, Radar Service Termination.
FAA Order JO 7110.65, Para 5–9–2, Final Approach Course Interception.

5–9–8. SIMULTANEOUS INDEPENDENT CLOSE PARALLEL APPROACHES –PRECISION RUNWAY MONITOR (PRM) APPROACHES

TERMINAL

When conducting PRM approaches, apply all pertinent provisions of paragraph 5–9–7 and the following:

a. PRM approaches may only be conducted when charted in the approach title, and where instrument approach charts specifically authorize simultaneous approaches.

REFERENCE–
P/CG – Precision Runway Monitor (PRM) System.
P/CG – Simultaneous Close Parallel Approaches.
P/CG – PRM Approach.

b. PRM approaches must be assigned when conducting instrument approaches to dual and triple parallel runways with runway centerlines separated by less than 4,300 feet.

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) 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.

NOTE–
Where RCLS is ≤3400 feet, the normal operating zone (NOZ) is constant at 700 feet; and for RCLS ≥3400 feet, the no transgression zone (NTZ) remains constant at 2000 feet.

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 5–1–9, 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 subparagraph 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.

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 subparagraph 3.

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.*

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.

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 5–2–21, 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 STARS 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 3–6–7, 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 3. VFR-On-Top

7–3–1. VFR-ON-TOP

a. You may clear an aircraft to maintain "VFR-on-top" if the pilot of an aircraft on an IFR flight plan requests the clearance.

PHRASEOLOGY–
MAINTAIN VFR-ON-TOP.

NOTE–
1. *When an aircraft has been cleared to maintain "VFR-on-top," the pilot is responsible to fly at an appropriate VFR altitude, comply with VFR visibility and distance from cloud criteria, and to be vigilant so as to see and avoid other aircraft. The pilot is also responsible to comply with instrument flight rules applicable to the flight (e.g., adherence to ATC clearances).*

2. *Although IFR separation is not applied, controllers must continue to provide traffic advisories and safety alerts, and apply merging target procedures to aircraft operating VFR-on-top.*

REFERENCE–
FAA Order JO 7110.65, Para 2–1–6, Safety Alert.
FAA Order JO 7110.65, Para 2–1–21, Traffic Advisories.
FAA Order JO 7110.65, Para 5–1–4, Merging Target Procedures.
FAA Order JO 7110.65, Para 7–1–1, Class A Airspace Restrictions.
AIM, Para 5–5–13, VFR–on–top.
14 CFR Section 91.157, Special VFR Weather Minimums.
14 CFR Section 91.159, VFR Cruising Altitude or Flight Level.

b. You may clear an aircraft to climb through clouds, smoke, haze, or other meteorological formations and then to maintain "VFR-on-top" if the following conditions are met:

1. The pilot requests the clearance.

2. You inform the pilot of the reported height of the tops of the meteorological formation, or

3. You inform the pilot that no top report is available.

4. When necessary, you ensure separation from all other traffic for which you have separation responsibility by issuing an alternative clearance.

5. When an aircraft is climbing to and reports reaching "VFR-on-top," reclear the aircraft to maintain "VFR-on-top."

PHRASEOLOGY–
CLIMB TO AND REPORT REACHING VFR-ON-TOP,

and

TOPS REPORTED (altitude),

or

NO TOPS REPORTS.

IF NOT ON TOP AT (altitude), MAINTAIN (altitude), AND ADVISE.

MAINTAIN VFR-ON-TOP.

c. Do not clear an aircraft to maintain "VFR-on-top" between sunset and sunrise to separate holding aircraft from each other or from en route aircraft unless restrictions are applied to ensure the appropriate IFR vertical separation.

PHRASEOLOGY–
MAINTAIN VFR-ON-TOP AT OR ABOVE/BELOW/BETWEEN (altitudes).

EXAMPLE–
"Maintain VFR-on-top at or above one three thousand five hundred."

"Maintain VFR-on-top at or below one two thousand five hundred."

"Maintain VFR-on-top at or between six thousand and one zero thousand."

d. When, in your judgment, there is reason to believe that flight in VFR conditions may become impractical, issue an alternative clearance which will ensure separation from all other aircraft for which you have separation responsibility.

PHRASEOLOGY–
IF UNABLE, (alternative procedure), AND ADVISE.

REFERENCE–
FAA Order JO 7110.65, Para 9–3–3, VFR-On-Top.

7–3–2. ALTITUDE FOR DIRECTION OF FLIGHT

Inform an aircraft maintaining "VFR-on-top" when a report indicates the pilot is not complying with 14 CFR Section 91.159(a).

NOTE–
As required by 14 CFR Section 91.159(a), the appropriate VFR altitudes for aircraft (not in a holding pattern of 2 minutes or less, or turning) operating more than 3,000 feet above the surface to and including 18,000 feet MSL:

Magnetic courses 0–179– odd cardinal altitudes plus

500 feet; e.g., 3,500, 5,500.

Magnetic courses 180–359– even cardinal altitudes plus 500 feet; e.g., 4,500, 8,500.

PHRASEOLOGY–

VFR-ON-TOP CRUISING LEVELS FOR YOUR DIRECTION OF FLIGHT ARE:

more than 3,000 feet above the surface to FL 180:

ODD/EVEN ALTITUDES/FLIGHT LEVELS PLUS FIVE HUNDRED FEET.

REFERENCE–
FAA Order JO 7110.65, Para 5–1–9, Radar Service Termination.

b. Do not assign landing sequence.

Section 9. Class B Service Area– Terminal

7–9–1. APPLICATION

Apply Class B services and procedures within the designated Class B airspace.

a. No person may operate an aircraft within Class B airspace unless:

1. The aircraft has an operable two-way radio capable of communications with ATC on appropriate frequencies for that Class B airspace.

2. The aircraft is equipped with the applicable operating transponder and automatic altitude reporting equipment specified in paragraph (a) of 14 CFR Section 91.215, except as provided in paragraph (d) of that section.

7–9–2. VFR AIRCRAFT IN CLASS B AIRSPACE

a. VFR aircraft must obtain an ATC clearance to operate in Class B airspace.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–18, Operational Requests.
FAA Order JO 7110.65, Para 2–4–22, Airspace Classes.

PHRASEOLOGY–
CLEARED THROUGH/TO ENTER/OUT OF BRAVO AIRSPACE,

and as appropriate,

VIA (route). MAINTAIN (altitude) WHILE IN BRAVO AIRSPACE.

or

CLEARED AS REQUESTED.

(Additional instructions, as necessary.)

REMAIN OUTSIDE BRAVO AIRSPACE. (When necessary, reason and/or additional instructions.)

NOTE–
1. *Assignment of radar headings, routes, or altitudes is based on the provision that a pilot operating in accordance with VFR is expected to advise ATC if compliance will cause violation of any part of the CFR.*

2. *Separation and sequencing for VFR aircraft is dependent upon radar. Efforts should be made to segregate VFR traffic from IFR traffic flows when a radar outage occurs.*

b. Approve/deny requests from VFR aircraft to operate in Class B airspace based on workload, operational limitations and traffic conditions.

c. Inform the pilot when to expect further clearance when VFR aircraft are held either inside or outside Class B airspace.

d. Inform VFR aircraft when leaving Class B airspace.

PHRASEOLOGY–
LEAVING (name) BRAVO AIRSPACE,

and as appropriate,

RESUME OWN NAVIGATION, REMAIN THIS FREQUENCY FOR TRAFFIC ADVISORIES, RADAR SERVICE TERMINATED, SQUAWK ONE TWO ZERO ZERO.

7–9–3. METHODS

a. To the extent practical, clear large turbine engine-powered airplanes to/from the primary airport using altitudes and routes that avoid VFR corridors and airspace below the Class B airspace floor where VFR aircraft are operating.

NOTE–
Pilots operating in accordance with VFR are expected to advise ATC if compliance with assigned altitudes, headings, or routes will cause violation of any part of the CFR.

b. Vector aircraft to remain in Class B airspace after entry. Inform the aircraft when leaving and reentering Class B airspace if it becomes necessary to extend the flight path outside Class B airspace for spacing.

NOTE–
14 CFR Section 91.131 states that "Unless otherwise authorized by ATC, each person operating a large turbine engine-powered airplane to or from a primary airport for which a Class B airspace area is designated must operate at or above the designated floors of the Class B airspace area while within the lateral limits of that area." Such authorization should be the exception rather than the rule.

REFERENCE–
FAA Order JO 7110.65, Para 5–1–6, Deviation Advisories. ■

c. Aircraft departing controlled airports within Class B airspace will be provided the same services as those aircraft departing the primary airport.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–18, Operational Requests.

7–9–4. SEPARATION

a. Standard IFR services to IFR aircraft.

b. VFR aircraft must be separated from VFR/IFR aircraft/ helicopter/rotorcraft that weigh more than 19,000 pounds and turbojets by no less than:

1. 1 ½ miles separation, or

NOTE–
When ISR is being displayed, discontinue 1 ½ –NM separation.

2. 500 feet vertical separation, or

NOTE–
Apply the provisions of paragraph 5–5–4, Minima, when wake turbulence separation is required.

3. Visual separation, as specified in paragraph 7–2–1, Visual Separation, paragraph 7–4–2, Vectors for Visual Approach, and paragraph 7–6–7, Sequencing.

NOTE–
Issue wake turbulence cautionary advisories in accordance with paragraph 2–1–20, Wake Turbulence Cautionary Advisories.

c. For the application of Class Bravo airspace separation requirements, the V-22 Osprey must be treated as a helicopter/rotorcraft.

d. VFR aircraft must be separated from all VFR/IFR aircraft which weigh 19,000 pounds or less by a minimum of:

1. Target resolution, except when ISR is being displayed, or

2. 500 feet vertical separation, or

NOTE–
1. *Apply the provisions of paragraph 5–5–4, Minima, when wake turbulence separation is required.*

2. *Aircraft weighing 19,000 pounds or less are listed in FAA Order JO 7360.1, Aircraft Type Designators.*

REFERENCE–
FAA Order JO 7360.1, Para 2–2, How Designators are Formulated.

3. Visual separation, as specified in paragraph 7–2–1, Visual Separation, paragraph 7–4–2, Vectors for Visual Approach, and paragraph 7–6–7, Sequencing.

NOTE–
Issue wake turbulence cautionary advisories in accordance with paragraph 2–1–20, Wake Turbulence Cautionary Advisories.

REFERENCE–
P/CG Term – Lateral Separation.
P/CG Term – Radar Separation.
P/CG Term – Target Resolution.
P/CG Term – Visual Separation.

7–9–5. TRAFFIC ADVISORIES

a. Provide mandatory traffic advisories and safety alerts, between all aircraft.

b. Apply merging target procedures in accordance with paragraph 5–1–4, Merging Target Procedures.

7–9–6. HELICOPTER TRAFFIC

VFR helicopters need not be separated from VFR or IFR helicopters. Traffic advisories and safety alerts must be issued as appropriate.

7–9–7. ALTITUDE ASSIGNMENTS

a. Altitude information contained in a clearance, instruction, or advisory to VFR aircraft must meet MVA, MSA, or minimum IFR altitude criteria.

b. Issue altitude assignments, if required, consistent with the provisions of 14 CFR Section 91.119.

NOTE–
The MSAs are:
1. *Over congested areas, an altitude at least 1,000 feet above the highest obstacle,*
2. *Over other than congested areas, an altitude at least 500 feet above the surface.*

REFERENCE–
FAA Order JO 7110.65, Para 4–5–2, Flight Direction.
FAA Order JO 7110.65, Para 4–5–3, Exceptions.
FAA Order JO 7110.65, Para 4–5–6, Minimum En Route Altitudes.

c. Aircraft assigned altitudes which are contrary to 14 CFR Section 91.159 must be advised to resume altitudes appropriate for the direction of flight when the altitude assignment is no longer required or when leaving Class B airspace.

PHRASEOLOGY–
RESUME APPROPRIATE VFR ALTITUDES.

7–9–8. APPROACH INTERVAL

The tower must specify the approach interval.

Section 2. Special Operations

9–2–1. AIRCRAFT CARRYING DANGEROUS MATERIALS

a. Provide the following special handling to military aircraft or military contracted aircraft carrying dangerous materials when:

1. The words "dangerous cargo," or "inert devices," or both are contained in the remarks section of the filed flight plan, or

NOTE–
1. *Certain types of military flights carrying dangerous materials require strict adherence to military regulations and flight planning along carefully selected routes. These flights must avoid heavily populated areas.*

2. *"Inert devices" are devices containing no dangerous materials but closely resembling nuclear or explosive items that are classified as dangerous and could be easily mistaken for their dangerous counterparts.*

2. The pilot uses these words in radio communication.

b. If it becomes necessary to issue a clearance to amend the route/altitude, advise the pilot:

1. Of the proposed change, and

2. The amount of delay to expect if it is necessary to maintain the present route/altitude.

c. When it becomes necessary for the pilot to refuse a clearance amending his/her route/altitude, he/she will advise if the traffic delay is acceptable or if an alternate route/altitude is desired. In such cases, offer all possible assistance.

d. When the aircraft is provided an en route descent, do not vector the aircraft from the planned route unless the pilot concurs.

e. Use special patterns and routings in areas where they have been developed for these flights. If special patterns and routings have not been developed, employ normal procedures.

9–2–2. CELESTIAL NAVIGATION TRAINING

EN ROUTE

a. Approve flight plans specifying celestial navigation only when it is requested for USAF or USN aircraft.

NOTE–
An ATC clearance must be obtained by the pilot before discontinuing conventional navigation to begin celestial navigation training. The pilot will advise when discontinuing celestial navigation and resuming conventional navigation. Celestial navigation training will be conducted within 30 NM of the route centerline specified in the en route clearance unless otherwise authorized by ATC. During celestial navigation training, the pilot will advise ATC before initiating any heading changes which exceed 20 degrees.

b. Within conterminous U.S. airspace, limit celestial navigation training to transponder-equipped aircraft within areas of ARTCC radar coverage.

c. Prior to control transfer, ensure that the receiving controller is informed of the nature of the celestial navigation training leg.

REFERENCE–
FAA Order JO 7110.65, Para 2–2–6, IFR Flight Progress Data.

9–2–3. EXPERIMENTAL AIRCRAFT OPERATIONS

a. When notified that an experimental aircraft requires special handling:

NOTE–
14 CFR Section 91.319(d)(3) requires that each person operating an aircraft with an experimental certificate must notify the control tower of the experimental nature of the aircraft when operating into or out of airports with operating control towers.

1. Clear the aircraft according to pilot requests as traffic permits and if not contrary to ATC procedures.

2. Once approved, do not ask the pilot to deviate from a planned action except to preclude an emergency situation.

b. At locations where volume or complexity of experimental aircraft operations warrant, a letter of agreement may be consummated between the facility and operator.

9–2–4. FAA RESEARCH AND DEVELOPMENT FLIGHTS

When coordinated in advance and traffic permits, approve requests for special flight procedures from aircraft participating in FAA research and develop-

ment test activities. These special procedures must be applied to participating aircraft/vehicles.

NOTE–
Special flight procedures for FAA research and development test activities must be approved by the facility air traffic manager prior to their use.

9–2–5. FLYNET

Provide expeditious handling for U.S. Government, civil or military aircraft using the code name "FLYNET." Relay the code name as an element in the remarks position of the flight plan.

NOTE–
The code name "FLYNET" indicates that an aircraft is transporting a nuclear emergency team or a disaster control team to the location of a potential or actual nuclear accident or an accident involving chemical agents or hazardous materials. It is in the public interest that they reach their destination as rapidly as possible.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–4, Operational Priority.
FAA Order JO 7610.4, Para 12–4–1, "FLYNET" Flights, Nuclear Emergency Teams.

9–2–6. IFR MILITARY TRAINING ROUTES

a. Except for aircraft operating in the same altitude reservation, clear aircraft into an MTR provided separation will be applied between successive aircraft unless otherwise covered in a letter of agreement between the military scheduling activity and the concerned ATC facility.

PHRASEOLOGY–
CLEARED INTO IR (designator).
MAINTAIN (altitude),

or

MAINTAIN IR (designator) ALTITUDE(S),

or

MAINTAIN AT OR BELOW (altitude),

or

CRUISE (altitude),

and if required,

CROSS (fix) AT OR LATER THAN (time).

b. Unless otherwise covered in a letter of agreement between the military scheduling activity and the concerned FAA facility, clear aircraft to exit an MTR.

PHRASEOLOGY–
CLEARED TO (destination/clearance limit) FROM IR (designator/exit fix) VIA (route).
MAINTAIN (altitude).

c. If the provisions of subparagraph a above cannot be accomplished, MTRs may be designated for MARSA operations. To preclude an inadvertent compromise of MARSA standards by ATC, appropriate MARSA application for such routes must be covered in a letter of agreement with the military scheduling activity. Establish separation between aircraft as soon as practicable after operation on the designated MARSA route is ended.

NOTE–
For designated MARSA routes, the military assumes responsibility for separation for MTR aircraft that have passed the primary/alternate entry fix until separation is established by ATC after operations on the MARSA route are completed.

d. The lateral airspace to be protected along an MTR is the designated width of the route.

e. Prior to an aircraft entering an MTR, request the pilot's estimate for the route's exit/alternate exit fix, the pilot's requested altitude after exiting and, if applicable, the number of reentries on a Strategic Training Range (STR).

PHRASEOLOGY–
(Call sign) VERIFY YOUR EXIT FIX ESTIMATE AND REQUESTED ALTITUDE AFTER EXIT,

and if applicable,

THE NUMBER OF REENTRIES.

f. Forward estimates for exit/alternate exit fixes, requested altitude after exit, and, if applicable, the number of reentries on the STR.

g. Apply the procedures of paragraph 6–1–2, Nonreceipt of Position Report, based upon the pilot's estimate for the route exit fix.

h. Clearance may be issued to amend or restrict operations on a route for ATC considerations. Where a route has been designated MARSA in accordance with subparagraph c, ATC must not amend or restrict operations in such a manner as to compromise MARSA provisions.

NOTE–
When MARSA is provided through route scheduling and circumstances prevent the pilot from entering the route within established time limits, it must be the responsibility of the pilot to inform the ATC facility and advise his/her intentions.

i. If an aircraft on an IR experiences a two-way radio communications failure and you are unable to determine if the aircraft is proceeding VFR in accordance with 14 CFR Section 91.185(b) or the aircraft has not been positively radar identified:

1. Provide separation to the destination airport based on the aircraft complying with the following:

(a) Maintain to the exit/alternate exit fix the higher of the following altitudes:

(1) The minimum IFR altitude for each of the remaining route segment(s) remaining on the route.

(2) The highest altitude assigned in the last ATC clearance.

(b) Depart the exit/alternate exit fix at the appropriate altitude specified in subparagraph (a) above, then climb/descend to the altitude filed in the flight plan for the remainder of the flight, or

NOTE–
In the event of a two-way communications failure, ATC will be based on the following anticipated pilot action at the exit fix. Unless otherwise covered in a letter of agreement, and if the pilot is unable to comply with the VFR provisions of 14 CFR Section 91.185/FLIP IFR Supplement, the pilot will exercise his/her emergency authority, squawk transponder ***Code 7700****, depart the exit/alternate exit fix and climb/descend (continuing to squawk 7700) to the altitude filed in the flight plan. Subsequent transponder operations will be in accordance with paragraph 10–4–4, Communications Failure. Air traffic controller action from the exit fix is as prescribed in paragraph 10–1–1, Emergency Determinations.*

(c) Proceed in accordance with the lost communication procedure contained in letters of agreement.

2. Continue to monitor the last ATC assigned discrete code.

NOTE–
Pilots who experience a two-way radio failure will adjust their transponder to ***Code 7700*** *during climb/descent to altitude filed for the next leg of the flight plan; then change to* ***Code 7600*** *for a period of 15 minutes. At the end of each 15–minute period, he/she will squawk 7700 for a period of 1 minute; all other times he/she will squawk 7600.*

j. Impose delays, if needed, to eliminate conflict with nonparticipating IFR aircraft when necessary to preclude denial of IR usage. Advise the pilot of the expected length and reason for delay.

9–2–7. INTERCEPTOR OPERATIONS

Provide maximum assistance to expedite the movement of interceptor aircraft on active air defense (scrambles) missions until the unknown aircraft is identified in accordance with the policies and procedures published in FAA Order JO 7610.4, Special Operations.

NOTE–
The FAA and the military have mutually agreed to the implementation of policies and procedures for control of air defense interceptor operations. Effective coordination and cooperation between FAA and the military at all levels are essential if policy objectives are to be met.

a. The ADCF initiating the SCRAMBLE must identify the mission as an active air defense mission.

b. ATC services must be used for active air defense missions insofar as the circumstances and situation permits.

c. Upon request, the ATC facility must expedite transfer of the control jurisdiction of the interceptors to the requesting ADCF.

9–2–8. SPECIAL INTEREST SITES

a. Immediately relay any reports or information regarding unusual aircraft activities in the vicinity of special interest sites such as nuclear power plants, power plants, dams, refineries, etc., to supervisory/CIC personnel.

NOTE–
Air traffic controllers have no responsibilities to monitor or observe aircraft in the vicinity of special interest sites unless directed by supervisory/CIC personnel.

9–2–9. SPECIAL AIR TRAFFIC RULES (SATR) AND SPECIAL FLIGHT RULES AREA (SFRA)

The Code of Federal Regulations prescribes special air traffic rules for aircraft operating within the boundaries of certain designated airspace. These areas are listed in 14 CFR Part 93 and can be found throughout the NAS. Procedures, nature of opera-

tions, configuration, size, and density of traffic vary among the identified areas.

a. Special Flight Rules Areas are areas of airspace wherein the flight of aircraft is subject to special air traffic rules set forth in 14 CFR Part 93, unless otherwise authorized by air traffic control. Not all areas listed in 14 CFR Part 93 are Special Flight Rules Areas, but special air traffic rules apply to all areas designated as SFRA.

REFERENCE–
14 CFR Part 93, Special Air Traffic Rules.
P/CG, SPECIAL AIR TRAFFIC RULES (SATR)
P/CG, SPECIAL FLIGHT RULES AREA (SFRA)

b. Each person operating an aircraft to, from, or within airspace designated as a SATR area or SFRA must adhere to the special air traffic rules set forth in 14 CFR Part 93, as applicable, unless otherwise authorized or required by ATC.

9–2–10. ATC SECURITY SERVICES FOR THE WASHINGTON, DC, SPECIAL FLIGHT RULES AREA (DC SFRA)

Provide ATC security services at locations where procedures are required for tracking aircraft in security services airspace. ATC security services are designed to support the national security mission of the FAA and other agencies. Two–way radio communications, flight planning, and an operational transponder on an assigned code are required for operations in the designated area.

a. When the assigned code is observed, advise the aircraft to proceed on course/as requested but to remain outside of Class B, C, and/or D airspace as appropriate.

PHRASEOLOGY–
(ACID) TRANSPONDER OBSERVED PROCEED ON COURSE/AS REQUESTED; REMAIN OUTSIDE (class) AIRSPACE.

1. Maintain continuous security tracking of VFR aircraft operating in the designated area to assist security forces in situational awareness. Immediately report all instances of loss of radio communication or the inability to conduct security tracking of an aircraft to the operations supervisor (OS)/CIC and wait for instructions.

2. Basic separation services to aircraft, for example, IFR, SVFR, Class B, Class C, TRSA, do not apply to ATC security tracking.

3. Aircraft with operating transponders, but without operating Mode C (altitude), require specific authorization from ATC to operate in the SFRA. ATC must coordinate with the Domestic Events Network (DEN) before approval.

4. Aircraft flying too low for radar coverage must be instructed to report landing or exiting the SFRA. Keep flight progress strips on these aircraft until pilot reports landing or exiting the SFRA. If a flight progress strip does not exist for the aircraft, record the call sign, transponder code, entry point (for example, north, northeast, east), and time of entry into the SFRA.

PHRASEOLOGY–
(Call sign), REPORT LANDING OR LEAVING THE SFRA.

5. United States military, law enforcement, and aeromedical flights are exempt from filing flight plans.

b. Establishing two–way Communications.

1. Pilots must establish two–way radio communications with ATC prior to entering the security service area. Responding to a radio call with, "(a/c call sign) standby," establishes radio communications and the pilot may enter the area, provided all other security requirements have been satisfied.

2. Aircraft requesting security services should not normally be held. However, if holding is necessary or workload/traffic conditions prevent immediate provision of ATC security services, inform the pilot to remain outside the designated area until conditions permit the provision of ATC security services. Inform the pilot of the expected length of delay.

PHRASEOLOGY–
(A/C call sign) REMAIN OUTSIDE OF THE (location) AND STANDBY. EXPECT (time) MINUTES DELAY.

c. Termination of Service.

1. If the aircraft is not landing within the designated area, provide security services until the aircraft exits the area and then advise the aircraft to squawk VFR and that frequency change is approved.

PHRASEOLOGY–
SQUAWK VFR, FREQUENCY CHANGE APPROVED.

or

CONTACT (facility identification).

2. When an aircraft is landing at an airport inside the area, instruct the pilot to remain on the assigned transponder code until after landing.

PHRASEOLOGY–
(ACID) REMAIN ON YOUR ASSIGNED TRANSPONDER CODE UNTIL YOU LAND, FREQUENCY CHANGE APPROVED.

3. Using approved handoff functionality, transfer the data blocks of all security tracked aircraft that will enter another sector/position for coordination of aircraft information/location. Upon acceptance of the transferred information, instruct the pilot to contact the next sector/positions' frequency.

9–2–11. SECURITY NOTICE (SECNOT)

Upon receiving notification of a SECNOT, the controller must forward all information on the subject aircraft to the OS/CIC. If information is not known, broadcast call sign on all frequencies and advise the OS/CIC of the response.

REFERENCE–
P/CG Term – Security Notice.
FAA Order JO 7210.3, Chapter 20, Section 9, Security Notice (SECNOT).

9–2–12. LAW ENFORCEMENT OPERATIONS

a. In the event information is received pertaining to stolen aircraft, the controller must forward all information to the OS/CIC for reporting on the Domestic Events Network (DEN).

REFERENCE–
FAA Order JO 7210.3, Para 2–7–7, Cooperation With Law Enforcement Agencies.

b. Special law enforcement operations.

1. Special law enforcement operations include inflight identification, surveillance, interdiction and pursuit activities performed in accordance with official civil and/or military mission responsibilities.

2. To facilitate accomplishment of these special missions, exemptions from specified parts of Title 14 of the Code of Federal Regulations have been granted to designated departments and agencies. However, it is each organization's responsibility to apprise ATC of their intent to operate under an authorized exemption before initiating actual operations.

REFERENCE–
FAA Order JO 7210.3, Para 19–3–1, Authorizations and Exemptions from Title 14, Code of Federal Regulations (14 CFR).

3. Additionally, some departments and agencies that perform special missions have been assigned coded identifiers to permit them to apprise ATC of ongoing mission activities and solicit special air traffic assistance.

REFERENCE–
FAA Order 7110.67, Air Traffic Management Security Services for Special Operations.

NOTE–
As specified in paragraph 2–1–4, Operational Priority, priority of handling for aircraft operating with coded identifiers will be the same as that afforded to SAR aircraft performing a SAR mission.

c. Assistance to law enforcement aircraft operations.

1. Provide the maximum assistance possible to law enforcement aircraft, when requested, in helping them locate suspect aircraft.

2. Communicate with law enforcement aircraft, when possible and if requested, on a frequency not paired with your normal communications frequencies.

3. Do not allow assistance to law enforcement aircraft to violate any required separation minima.

4. Do not assist VFR law enforcement aircraft in any way that will create a situation which, in your judgment, places the aircraft in unsafe proximity to terrain or other aircraft.

9–2–13. MILITARY AERIAL REFUELING

Authorize aircraft to conduct aerial refueling along published or special tracks at their flight plan altitudes, unless otherwise requested.

PHRASEOLOGY–
CLEARED TO CONDUCT REFUELING ALONG (number) TRACK,

or

FROM (fix) TO (fix),

and

MAINTAIN BLOCK (altitude) THROUGH (altitude),

or

COMMENCING AT (altitude), DESCENDING TO (altitude).

NOTE–
1. *During aerial refueling, tanker aircraft are responsible for receiver aircraft communication with ATC and for their navigation along the track.*

2. *Aerial refueling airspace is not sterilized airspace and other aircraft may transit this airspace provided vertical or lateral separation is provided from refueling aircraft.*

3. *MARSA begins between the tanker and receiver when the tanker and receiver(s) have entered the air refueling airspace and the tanker advises ATC that he/she is accepting MARSA.*

4. *MARSA ends between the tanker and receiver when the tanker advises ATC that the tanker and receiver aircraft are vertically positioned within the air refueling airspace and ATC advises MARSA is terminated.*

REFERENCE–
FAA Order JO 7110.65, Para 2–1–11, Use of MARSA.
FAA Order JO 7110.65, Para 5–5–8, Additional Separation for Formation Flights.
FAA Order JO 7610.4, Chapter 10, Aerial Refueling.

a. Provide radar assistance to the rendezvous for participating aircraft:

1. When requested, and

2. By providing vertical separation prior to MARSA declaration.

b. Do not request receiver aircraft that have been cleared to conduct air refueling and have departed the ARIP to:

1. Make code changes when less than 5 miles from the tanker.

2. Squawk standby when less than 1 mile or more than 3 miles from the tanker.

NOTE–
Requests for receiver aircraft to make code changes during air refueling diverts the receiver pilot's attention during a critical phase of flight.

c. When issuing an initial air refueling clearance, you may request a receiver to squawk standby when the receiver reaches a point 3 miles from the tanker.

NOTE–
1. *Receiver aircraft will squawk normal when separation from the tanker is greater than 3 miles.*

2. *Once rendezvous is completed, heading and altitude assignments may be made with the tanker concurrence with MARSA remaining in effect.*

3. *Upon rendezvous completion, the tanker must keep receiver aircraft within 3 miles of the tanker until MARSA is terminated.*

d. After MARSA has been declared, you should avoid issuing course or altitude changes prior to rendezvous.

NOTE–
Altitude or course changes issued will automatically void MARSA.

e. Do not use the altitude vacated during the refueling operation until the refueling aircraft has reported reaching the next IFR altitude.

REFERENCE–
FAA Order JO 7110.65, Para 6–6–2, Exceptions.

f. Approve requests by the tanker pilot for vectors or alternative routes or altitudes as follows:

1. Furnish vectors or alternative altitudes at any time.

2. Furnish nonradar routes only after the refueling aircraft have passed the ARCP.

NOTE–
1. *To meet a training requirement that aerial refueling be accomplished in a nonradar environment, the military has requested that vectors be furnished only upon request.*

2. *The tanker commander is responsible for coordinating all inflight requests with other aircraft in the refueling mission before submission of such requests to the center.*

3. *Normally, aircraft conducting aerial refueling operations will utilize at least three consecutive altitudes.*

g. Unless a vector or alternative route has been furnished, clear the aircraft to depart the refueling track at a navigational reference point or egress fix.

h. Request an aircraft to report the ARIP, ARCP, or egress fix as necessary.

PHRASEOLOGY–
REPORT:

A–R–I–P,

or

A–R–C–P,

or

EGRESS FIX.

i. Expect the following procedures in addition to those required by the appropriate parts of Title 14 of the Code of Federal Regulations in the event of two-way communications failure:

1. The tanker will depart the track from the highest altitude in the block.

2. The receiver will depart the track from the lowest altitude in the block.

3. Aircraft will squawk 7600 for at least 2 minutes prior to departing the track.

REFERENCE–
FAA Order JO 7110.65, Para 9–2–14, Military Operations Above FL 600.

9–2–14. MILITARY OPERATIONS ABOVE FL 600

Control aircraft operating above FL 600 using the following procedures:

a. Flight plans involving supersonic flight are required 16 hours in advance of proposed departure times for processing and approval by the ARTCCs concerned. The originating ARTCC, where the flight plan is first filed, may waive the 16–hour advance filing requirement.

b. The route of flight must be defined by at least one high altitude fix within each ARTCC area without regard to the distance between fixes. Additionally, the entry and exit points of turns of 90 degrees or more will be designated.

c. Elapsed times from takeoff to the first fix in each ARTCC area must be included in the route of flight.

d. The ARTCC which originates the flight plan must forward departure times to all ARTCCs responsible for processing the flight plan.

e. Approval of the flight plan indicates approval of both route and flight levels (if stated) including operations below FL 600 (aerial refueling).

PHRASEOLOGY–
CLEARED AS FILED VIA ROUTE AND FLIGHT LEVELS.

REFERENCE–
FAA Order JO 7110.65, Para 9–2–13, Military Aerial Refueling.

f. Separation. Use the following as minima in lieu of the corresponding type of separation prescribed in:

NOTE–
The primary method described to provide separation between two supersonic aircraft is to descend the aircraft at the lower FL and provide vertical separation since the aircraft at the higher FL may not be able to climb rapidly enough to establish the required separation. Another aspect which should be considered is that supersonic aircraft during turns, either programmed or as the result of vectors, will lose a few thousand feet. Vectoring supersonic aircraft seriously affects the range and mission objectives. Radar separation is the preferred method of separating a subsonic aircraft both from another subsonic aircraft or from a supersonic aircraft.

1. Paragraph 4–5–1, Vertical Separation Minima: *5,000 feet.*

NOTE–
1. *The security requirements of the military services preclude the transmission of actual altitude information on the air/ground or landline circuits. Altitude information for the day should be readily available to the controllers at their positions of operation. The classification requirements of the altitude information remains unchanged.*

2. *Pilots will report their altitude, using the coded plan, and intended flight profile on initial contact with each ARTCC.*

2. Paragraph 6–5–4, Minima Along Other Than Established Airways or Routes: Protect the airspace 25 miles either side of the route centerline. For turns by supersonic aircraft, protect the airspace 75 miles on the overflown side and 25 miles on the other side. For turns by subsonic aircraft, protect the airspace 34 miles on the overflown side and 25 miles on the other side.

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

9–2–15. MILITARY SPECIAL USE FREQUENCIES

a. Assign special use frequency to:

NOTE–
Special use frequencies are assigned to ARTCCs in such a manner that adjacent ARTCCs will not have the same frequency. They are to be used within the ARTCC area jurisdiction from the established FL base of the high altitude sectors and above. Each high altitude sector should have the capability to use the special use frequency on a shared basis.

1. USAF, U.S. Navy, and Air National Guard (ANG) single-pilot jet aircraft formations operating at night or in instrument weather conditions. Formations of five or more USAF aircraft deploying either to a continental U.S. staging base or nonstop to an overseas location are authorized to use special use frequencies at any time. Normally these deployments will be conducted within an altitude reservation.

2. U–2 and B–57 (pressure suit flights) aircraft at all altitudes/FLs except where terminal operations require the assignment of other frequencies.

NOTE–
Aerial refueling operations may require that aircraft leave the special use frequency for communications with the tanker. This will occur when the receiver is approximately 200 miles from the ARCP. The tanker aircraft will remain on the ARTCC assigned frequency and will relay clearances to the receiver as required. An alternate means of communications between the tanker and receiver is HF radio.

3. All aircraft during supersonic flight.

NOTE–
Pilots are expected to request assignment of the special use frequency in the remarks section of the flight plan or before entering supersonic flight. B–57 aircraft engaged in pressure suit operations will use the static call sign KITE and flights will normally be conducted from Dover, Eielson, Ellington, Hickman, Howard, Kirtland, and McClellan Air Force Bases.

4. E–3A AWACS mission crews when operations are being conducted as an MRU in accordance with appropriate letters of agreement.

b. The special use frequency may be assigned as "backup" for the high-altitude sector when direct communications are essential because of a potential emergency control situation.

c. Do not assign the special use frequency to the aircraft in subparagraph a1 above, when they will operate in airspace assigned for special military operations.

9–2–16. AVOIDANCE OF AREAS OF NUCLEAR RADIATION

a. Advise pilots whenever their proposed flight path will traverse a reported or forecasted area of hazardous radiation and reroute the aircraft when requested by the pilot.

REFERENCE–
FAA Order JO 7610.4, Para 4–4–4, Avoidance of Hazardous Radiation Areas.

b. Inform pilots when an airfield of intended landing lies within a reported or forecasted area of hazardous radiation and request the pilot to advise his/her intentions.

9–2–17. SAMP FLIGHTS

Provide special handling to U.S. Government and military aircraft engaged in aerial sampling/surveying missions, sampling for nuclear, chemical, or hazardous material contamination. Honor inflight clearance requests for altitude and route changes to the maximum extent possible. Other IFR aircraft may be recleared so that requests by SAMP aircraft are honored. Separation standards as outlined in this order must be applied in all cases.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–4, Operational Priority.
FAA Order JO 7110.65, Para 2–4–20, Aircraft Identification.
FAA Order JO 7610.4, Para 4–4–4, Avoidance of Hazardous Radiation Areas.

9–2–18. AWACS/NORAD SPECIAL FLIGHTS

Do not delay E–3 AWACS aircraft identified as "AWACS/NORAD Special" flights. The following control actions are acceptable while expediting these aircraft to the destination orbit.

a. En route altitude changes $^{+}$/– 2,000 feet from the requested flight level.

b. Radar vectors or minor route changes that do not impede progress towards the destination orbit.

NOTE–
NORAD has a requirement to position E–3 AWACS aircraft at selected locations on a time-critical basis. To the extent possible these flights will utilize routes to the destination orbit that have been precoordinated with the impacted ATC facilities. To identify these flights, the words "AWACS/NORAD SPECIAL" will be included as the first item in the remarks section of the flight plan.

9–2–19. WEATHER RECONNAISSANCE FLIGHTS

TEAL and NOAA mission aircraft fly reconnaissance flights to gather meteorological data on winter storms, (NWSOP missions), hurricanes and tropical cyclones (NHOP missions). The routes and timing of these flights are determined by movement of the storm areas and not by traffic flows.

a. When a dropsonde release time is received from a TEAL or NOAA mission aircraft, workload and priorities permitting, controllers must advise the mission aircraft of any traffic estimated to pass through the area of the drop at altitudes below that of the mission aircraft. This traffic advisory must include:

1. Altitude.

2. Direction of flight.

3. ETA at the point closest to drop area (or at the fix/intersection where drop will occur).

NOTE–
A dropsonde is a 14–inch long cardboard cylinder about 2.75 inches in diameter, that weighs approximately 14 ounces (400 grams), and has a parachute attached. When released from the aircraft it will fall at a rate of approximately 2,500 feet per minute. Controllers should recognize that a dropsonde released at FL 310 will be a factor for traffic at FL 210 four minutes later. It is the aircraft commanders responsibility to delay release of dropsondes if traffic is a factor. Aircraft commanders will delay release of dropsondes based solely upon traffic as issued by ATC.

b. When advised that an airborne TEAL or NOAA aircraft is requesting a clearance via CARCAH, issue the clearance in accordance with Chapter 4, IFR, Section 2, Clearances.

REFERENCE–
FAA Order JO 7110.65, Para 4–2–1, Clearance Items.
FAA Order JO 7110.65, Para 4–2–2, Clearance Prefix.
FAA Order JO 7110.65, Para 4–2–3, Delivery Instructions.

c. If a TEAL or NOAA mission aircraft must be contacted but is out of VHF, UHF, and HF radio range, advise the supervisory traffic management coordinator–in–charge.

REFERENCE–
FAA Order JO 7210.3, Para 5–3–4, Weather Reconnaissance Flights.
FAA Order JO 7110.65, Para 2–1–4, Operational Priority.

d. Aircraft operations associated with a Weather Reconnaissance Area (WRA) must be conducted in accordance with the Memorandum of Agreement between the National Oceanic and Atmospheric Administration Aircraft Operations Center, U.S. Air Force Reserve Command 53rd Weather Reconnaissance Squadron, and the Federal Aviation Administration Air Traffic Organization in Support of the National Hurricane Operations Plan (FAA Order JO 7610.4, Appendix 3), and the associated letters of agreement.

9–2–20. EVASIVE ACTION MANEUVER

Approve a pilot request to conduct an evasive action maneuver only on the basis of a permissible traffic situation. Specify the following items, as necessary, when issuing approval:

NOTE–
The "evasive action" maneuver is performed by a bomber/fighter bomber aircraft at or above FL 250 along a 60 NM long segment of the flight plan route overlying a RBS or other site and includes:

1. *Flying a zigzag pattern on both the left and right side of the flight plan route centerline. Altitude deviations are made in conjunction with the lateral maneuvering.*

2. *Lateral deviations from the route centerline will not normally exceed 12 miles. Altitude variations must not exceed plus or minus 1,000 feet of the assigned flight level; i.e., confined within a 2,000 foot block.*

a. Specific route segment on which the maneuver will take place.

b. Distance of maximum route deviation from the centerline in miles.

c. Altitude.

PHRASEOLOGY–
CLEARED TO CONDUCT EVASIVE ACTION MANEUVER FROM (fix) TO (fix),

and

(number of miles) EITHER SIDE OF CENTERLINE,

and

MAINTAIN (altitude) THROUGH (altitude),

and

COMPLETE MANEUVER AT (fix) AT (altitude).

9–2–21. NONSTANDARD FORMATION/ CELL OPERATIONS

Occasionally the military is required to operate in a nonstandard cell formation and controllers should be knowledgeable of the various tactics employed and the procedures used.

REFERENCE–
FAA Order JO 7610.4, Chapter 12, Section 11, Formation Flight.

a. Formation leaders are responsible for obtaining ATC approval to conduct nonstandard formation/cell operations.

b. When nonstandard formation/cell operations have been approved, controllers must assign sufficient altitudes to allow intra-cell vertical spacing of 500 feet between each aircraft in the formation.

c. Control nonstandard formation/cell operations on the basis that MARSA is applicable between the participating aircraft until they establish approved separation which is acknowledged by ATC.

d. Apply approved separation criteria between the approved nonstandard formation/cell envelope and nonparticipating aircraft.

e. Clear aircraft operating in a nonstandard formation/cell to the breakup fix as the clearance limit. Forward data pertaining to route or altitude beyond the breakup point to the center concerned as a part of the routine flight plan information.

f. *EN ROUTE.* If the breakup occurs in your area, issue appropriate clearances to authorize transition from formation to individual routes or altitudes. If a breakup cannot be approved, issue an appropriate clearance for the flight to continue as a formation.

9–2–22. OPEN SKIES TREATY AIRCRAFT

a. Open Skies aircraft will be identified by the call sign "OSY" (Open Skies) followed by the flight number and a one–letter mission suffix.

EXAMPLE–
OSY123D
Mission suffixes:
**F = Observation Flights (Priority).*
**D = Demonstration Flights (Priority).*
**T = Transit Flights (Nonpriority).*

NOTE–
1. *Observation/Demonstration flights are conducted under rigid guidelines outlined in the Treaty on Open Skies that govern sensor usage, maximum flight distances, altitudes and priorities.*

2. *Transit flights are for the sole purpose of moving an Open Skies aircraft from airport to airport in preparation for an actual Open Skies "F" or "D" mission.*

b. Provide priority and special handling to expedite the movement of an Open Skies observation or demonstration flight.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–4, Operational Priority, subpara l.
FAA Order JO 7210.3, Para 5–3–5, Open Skies Treaty Aircraft Priority Flights (F and D).
Treaty on Open Skies, Treaty Document, 102–37.

c. Open Skies (F and D) Treaty aircraft, while maintaining compliance with ATC procedures, must have priority over activities in special use airspace (SUA)/Air Traffic Control Assigned Airspace (ATCAA). Open Skies (F and D) Treaty aircraft are nonparticipating aircraft and must be allowed to transit SUA/ATCAA as filed after appropriate and timely coordination has been accomplished between the using agency and controlling agency.

NOTE–
A letter of agreement is not required for nonparticipating aircraft to transit deactivated/released airspace.

REFERENCE–
FAA Order JO 7110.65, Para 9–3–4, Transiting Active SUA/ATCAA.

1. Open Skies (F and D) Treaty flights transiting SUA/ATCAA will be handled in the following manner:

(a) The ATC facility controlling the Open Skies (F and D) Treaty flight must advise the using agency, or appropriate ATC facility, upon initial notification and when the aircraft is 30 minutes from the SUA/ATCAA boundary; and

(1) For active SUA/ATCAA with an ATC facility, coordinate and execute the transit of Open Skies (F and D) Treaty aircraft.

REFERENCE–
FAA Order JO 7110.65, Para 9–3–4, Transiting Active SUA/ATCAA.

(2) For active SUA/ATCAA without an ATC facility, the using agency must deactivate/release the SUA/ATCAA to permit the Open Skies (F and D) Treaty aircraft to transit as filed in proximity to the active SUA/ATCAA. When deactivating/releasing the SUA/ATCAA for this purpose, the using agency is only required to deactivate/release the portion of the SUA/ATCAA to the controlling agency that is necessary to provide approved separation.

(b) The using agency must deactivate/release the SUA/ATCAA, or portion thereof, no later than 15 minutes prior to the Open Skies (F and D) Treaty aircraft reaching the SUA/ATCAA boundary.

(c) If the controlling agency is unable to confirm with the using agency that all conflicting activities in the SUA/ATCAA have ceased, the Open Skies aircraft must not be permitted access to the SUA/ATCAA.

REFERENCE–
FAA Order JO 7110.65, Para 9–3–2, Separation Minima.

2. Return SUA/ATCAA to the using agency, if requested, within (15) minutes after the Open Skies (F and D) Treaty aircraft clears the SUA/ATCAA.

d. Clear the aircraft according to the filed flight plan.

1. Do not ask the pilot to deviate from the planned action or route of flight except to preclude an emergency situation or other higher priority aircraft.

2. Do not impose air traffic control delays except to preclude emergency situations or other higher priority aircraft.

NOTE–
If for reasons of flight safety the route or altitude must be changed, return the aircraft to the filed flight plan route as soon as practical.

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 ATO Space Operations 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 ATO Space Operations 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 ATO Space Operations 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 ATO Space Operations 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.

Section 2. Emergency Assistance

10–2–1. INFORMATION REQUIREMENTS

a. Start assistance as soon as enough information has been obtained upon which to act. Information requirements will vary, depending on the existing situation. Minimum required information for inflight emergencies is:

NOTE–
In the event of an ELT signal see paragraph 10–2–10, Emergency Locator Transmitter (ELT) Signals.

1. Aircraft identification and type.

2. Nature of the emergency.

3. Pilot's desires.

b. After initiating action, obtain the following items or any other pertinent information from the pilot or aircraft operator, as necessary:

NOTE–
1. *Emergency Autoland systems may not provide all of the required information for emergencies. Use the information provided to develop an appropriate course of action to assist the aircraft.*

2. *If an emergency has been declared by an Emergency Autoland system, transmissions to the aircraft may go unanswered.*

3. *Normally, do not request this information from military fighter–type aircraft that are at low altitudes (for example, on approach, immediately after departure, on a low level route). However, request the position of an aircraft that is not visually sighted or displayed on radar if the location is not given by the pilot.*

1. Aircraft altitude.

2. Fuel remaining in time.

3. Pilot reported weather.

4. Pilot capability for IFR flight.

5. Time and place of last known position.

6. Heading since last known position.

7. Airspeed.

8. Navigation equipment capability.

9. NAVAID signals received.

10. Visible landmarks.

11. Aircraft color.

12. Number of people on board.

13. Point of departure and destination.

14. Emergency equipment on board.

10–2–2. FREQUENCY CHANGES

Although 121.5 MHz and 243.0 MHz are emergency frequencies, it might be best to keep the aircraft on the initial contact frequency. Change frequencies only when there is a valid reason.

10–2–3. AIRCRAFT ORIENTATION

Orientate an aircraft by the means most appropriate to the circumstances. Recognized methods include:

a. Radar.

b. NAVAIDs.

c. Pilotage.

d. Sighting by other aircraft.

10–2–4. ALTITUDE CHANGE FOR IMPROVED RECEPTION

When you consider it necessary and if weather and circumstances permit, recommend that the aircraft maintain or increase altitude to improve communications or radar.

NOTE–
Aircraft with high-bypass turbofan engines (such as B747) encountering volcanic ash clouds have experienced total loss of power to all engines. Damage to engines due to volcanic ash ingestion increases as engine power is increased, therefore, climb while in the ash cloud is to be avoided where terrain permits.

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

10–2–5. EMERGENCY SITUATIONS

Consider that an aircraft emergency exists and inform the RCC or ARTCC if:

NOTE–
USAF facilities are only required to notify the ARTCC.

a. An emergency is declared by any of the following:

1. The pilot.

2. Facility personnel.

3. Officials responsible for the operation of the aircraft.

4. A system–generated transmission from an aircraft.

b. There is unexpected loss of radar contact and radio communications with any IFR or VFR aircraft.

c. Reports indicate it has made a forced landing, is about to do so, or its operating efficiency is so impaired that a forced landing will be necessary.

d. Reports indicate the crew has abandoned the aircraft or is about to do so.

e. An emergency transponder code is displayed or reported.

NOTE–
EN ROUTE. ERAM: Code 7700 causes an emergency indicator to blink in the data block.

f. Intercept or escort aircraft services are required.

g. The need for ground rescue appears likely.

h. An Emergency Locator Transmitter (ELT) signal is heard or reported.

REFERENCE–
FAA Order JO 7110.65, Para 10–1–3 , Providing Assistance.
FAA Order JO 7110.65, Para 10–2–10 , Emergency Locator Transmitter (ELT) Signals.

10–2–6. HIJACKED AIRCRAFT

Hijack attempts or actual events are a matter of national security and require special handling. Policy and procedures for hijack situations are detailed in FAA Order JO 7610.4, Special Operations. FAA Order JO 7610.4 describes reporting requirements, air crew procedures, air traffic procedures and escort or interceptor procedures for hijack situations.

REFERENCE–
FAA Order JO 7610.4, Chapter 7, Procedures for Handling Suspicious Flight Situations and Hijacked Aircraft.
FAA Order JO 7110.65, Para 5–2–11 , Code Monitor.

10–2–7. VFR AIRCRAFT IN WEATHER DIFFICULTY

a. If VFR aircraft requests assistance when it encounters or is about to encounter IFR weather conditions, determine the facility best able to provide service. If a frequency change is necessary, advise the pilot of the reason for the change, and request the aircraft contact the appropriate control facility. Inform that facility of the situation. If the aircraft is unable to communicate with the control facility, relay information and clearances.

b. 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.

10–2–8. RADAR ASSISTANCE TO VFR AIRCRAFT IN WEATHER DIFFICULTY

a. If a VFR aircraft requests radar assistance when it encounters or is about to encounter IFR weather conditions, ask the pilot if he/she is qualified for and capable of conducting IFR flight.

b. If the pilot states he/she is qualified for and capable of IFR flight, request him/her to file an IFR flight plan and then issue clearance to destination airport, as appropriate.

c. If the pilot states he/she is not qualified for or not capable of conducting IFR flight, or if he/she refuses to file an IFR flight plan, take whichever of the following actions is appropriate:

1. Inform the pilot of airports where VFR conditions are reported, provide other available pertinent weather information, and ask if he/she will elect to conduct VFR flight to such an airport.

2. If the action in subparagraph 1 above is not feasible or the pilot declines to conduct VFR flight to another airport, provide radar assistance if the pilot:

(a) Declares an emergency.

(b) Refuses to declare an emergency and you have determined the exact nature of the radar services the pilot desires.

3. If the aircraft has already encountered IFR conditions, inform the pilot of the appropriate terrain/obstacle clearance minimum altitude. If the aircraft is below appropriate terrain/obstacle clearance minimum altitude and sufficiently accurate position information has been received or radar identification is established, furnish a heading or

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.

NOTE–
Volcanic ash clouds are not normally detected by airborne or air traffic radar systems.

b. If advised by an aircraft that it has entered a volcanic ash cloud and indicates that a distress situation exists:

1. Consider the aircraft to be in an emergency situation.

2. Do not initiate any climb clearances to turbine–powered aircraft until the aircraft has exited the ash cloud.

3. Do not attempt to provide escape vectors without pilot concurrence.

NOTE–
1. *The recommended escape maneuver is to reverse course and begin a descent (if terrain permits). However, it is the pilot's responsibility to determine the safest escape route from the ash cloud.*

2. *Controllers should be aware of the possibility of complete loss of power to any turbine–powered aircraft that encounters an ash cloud.*

REFERENCE–
FAA Order JO 7110.65, Para 10–2–4, Altitude Change for Improved Reception.
AIM, Para 7–5–9, Flight Operations in Volcanic Ash.

10–2–19. REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT

a. If an air traffic controller receives a report of the death of person, an illness, and/or other public health risk obtain the following information and notify the operations manager in charge (OMIC)/operations supervisor (OS)/controller-in-charge (CIC) as soon as possible.

1. Call sign.

2. Number of suspected cases of illness on board.

3. Nature of the illnesses or other public health risk, if known.

4. Number of persons on board.

5. Number of deaths, if applicable.

6. Pilot's intent (for example, continue to destination or divert).

7. Any request for assistance (for example, needing emergency medical services to meet the aircraft at arrival).

b. The OMIC/OS/CIC must relay the information to the DEN as soon as possible.

NOTE–
1. *If the ATC facility is not actively monitoring the DEN or does not have a dedicated line to the DEN, they must call into the DEN directly via 844–432–2962 (toll free).*

2. *Except in extraordinary circumstances, such as a situation requiring ATC intervention, follow-on coordination regarding the incident will not involve ATC frequencies.*

3. *The initial report to a U.S. ATC facility may be passed from a prior ATC facility along the route of flight.*

REFERENCE–
FAA Order JO 7210.3, Para 2-1-33, Reporting Death, Illness, or Other Public Health Risk On Board Aircraft.

Section 4. Control Actions

10–4–1. TRAFFIC RESTRICTIONS

IFR traffic which could be affected by an overdue or unreported aircraft must be restricted or suspended unless radar separation is used. The facility responsible must restrict or suspend IFR traffic for a period of 30 minutes following the applicable time listed in subparagraphs a through e:

a. The time at which approach clearance was delivered to the pilot.

b. The EFC time delivered to the pilot.

c. The arrival time over the NAVAID serving the destination airport.

d. The current estimate, either the control facility's or the pilot's, whichever is later, at:

1. The appropriate en route NAVAID or fix, and

2. The NAVAID serving the destination airport.

e. The release time and, if issued, the clearance void time.

REFERENCE–
FAA Order JO 7110.65, Para 4–3–4, Departure Release, Hold for Release, Release Times, Departure Restrictions, and Clearance Void Times.

10–4–2. LIGHTING REQUIREMENTS

a. *EN ROUTE.* At nontower or non–FSS locations, request the airport management to light all runway lights, approach lights, and all other required airport lighting systems for at least 30 minutes before the ETA of the unreported aircraft until the aircraft has been located or for 30 minutes after its fuel supply is estimated to be exhausted.

b. *TERMINAL.* Operate runway lights, approach lights, and all other required airport lighting systems for at least 30 minutes before the ETA of the unreported aircraft until the aircraft has been located or for 30 minutes after its fuel supply is estimated to be exhausted.

REFERENCE–
FAA Order JO 7110.65, Para 3–4–1, Emergency Lighting.

10–4–3. TRAFFIC RESUMPTION

After the 30–minute traffic suspension period has expired, resume normal air traffic control if the operators or pilots of other aircraft concur. This concurrence must be maintained for a period of 30 minutes after the suspension period has expired.

REFERENCE–
FAA Order JO 7110.65, Para 4–3–4, Departure Release, Hold for Release, Release Times, Departure Restrictions, and Clearance Void Times.

10–4–4. COMMUNICATIONS FAILURE

Take the following actions, as appropriate, if two-way radio communications are lost with an aircraft:

NOTE–
1. *When an IFR aircraft experiences two-way radio communications failure, air traffic control is based on anticipated pilot actions. Pilot procedures and recommended practices are set forth in the AIM, CFRs, and pertinent military regulations.*

2. *Should the pilot of an aircraft equipped with a coded radar beacon transponder experience a loss of two-way radio capability, the pilot can be expected to adjust the transponder to reply on Mode 3/A* ***Code 7600****.*

a. In the event of lost communications with an aircraft under your control jurisdiction use all appropriate means available to reestablish communications with the aircraft. These may include, but are not limited to, emergency frequencies, NAVAIDs that are equipped with voice capability, FSS, New York Radio, San Francisco Radio, etc.

NOTE–
1. *New York Radio and San Francisco Radio are operated by Collins Aerospace (formerly ARINC, Incorporated) under contract with the FAA for communications services. These Radio facilities have the capability of relaying information to/from ATC facilities throughout the country.*

2. *Aircraft communications addressing and reporting system (ACARS) or selective calling (SELCAL) may be utilized to reestablish radio communications with suitably equipped aircraft. ACARS can be utilized by contacting San Francisco Radio at (800)–621–0140 or New York Radio at (800) 645–1095. Provide the aircraft call sign, approximate location, and contact instructions. In order to utilize the SELCAL system, the SELCAL code for the subject aircraft must be known. If the SELCAL code is not contained in the remarks section of the flight plan, contact the pertinent air carrier dispatch office to determine the code. Then contact San Francisco Radio (for aircraft over the Pacific, U.S. or Mexico) or New York Radio (for aircraft over the Atlantic, Gulf of Mexico, or Caribbean) and*

provide the aircraft call sign, SELCAL code, approximate location, and contact instructions.

b. Broadcast clearances through any available means of communications including the voice feature of NAVAIDs.

NOTE–
1. *Some UHF equipped aircraft have VHF navigation equipment and can receive 121.5 MHz.*

2. *"Any available means" includes the use of FSS and New York Radio or San Francisco Radio.*

REFERENCE–
FAA Order JO 7110.65, Para 4–2–2, Clearance Prefix.

c. Attempt to re-establish communication by having the aircraft use its transponder or make turns to acknowledge clearances and answer questions. Request any of the following in using the transponder:

1. Request the aircraft to reply Mode 3/A "IDENT."

2. Request the aircraft to reply on **Code 7600** or if already on **Code 7600**, the appropriate stratum code.

3. Request the aircraft to change to "stand-by" for sufficient time for you to be sure that the lack of a target is the result of the requested action.

PHRASEOLOGY–
REPLY NOT RECEIVED, (appropriate instructions).

(Action) OBSERVED, (additional instructions/information if necessary).

d. Broadcast a clearance for the aircraft to proceed to its filed alternate airport at the MEA if the aircraft operator concurs.

REFERENCE–
FAA Order JO 7110.65, Para 5–2–4, Radio Failure.
FAA Order JO 7110.65, Para 9–2–6, IFR Military Training Routes.

e. If radio communications have not been (re) established with the aircraft after 5 minutes, consider the aircraft's or pilot's activity to be suspicious and report it to the OS/CIC per FAA Order JO 7610.4, Chapter 7, Procedures for Handling Suspicious Flight Situations and Hijacked Aircraft, and paragraph 2–1–26f, Supervisory Notification, of this order.

b. In all cases of aircraft ditching, the airspace required for SAR operations must be determined by the RCC. The ACC must block that airspace until the RCC advises the airspace is no longer required. An International Notice to Air Missions (NOTAM) must be issued describing the airspace affected.

c. The following actions will be taken in the event an aircraft must make an emergency descent:

1. In the event an aircraft requests an emergency descent:

(a) Issue a clearance to the requested altitude if approved separation can be provided.

(b) Advise the aircraft of the traffic, and request its intentions if traffic prevents an unrestricted descent.

PHRASEOLOGY–
ATC ADVISES (aircraft identification) UNABLE TO APPROVE UNRESTRICTED DESCENT.
TRAFFIC (traffic information).
REQUEST INTENTIONS.

2. In the event an aircraft is making or will make an emergency descent without a clearance:

(a) Advise other aircraft of the emergency descent.

PHRASEOLOGY–
ATC ADVISES (aircraft identification/all aircraft) BE ALERT FOR EMERGENCY DESCENT IN THE VICINITY OF (latitude/longitude) FROM (altitude/FL) TO (altitude/FL).

(b) Advise other aircraft when the emergency descent is complete.

PHRASEOLOGY–
(Aircraft identification/all aircraft) EMERGENCY DESCENT AT (location) COMPLETED.

3. Upon notification that an aircraft is making an emergency descent through other traffic, take action immediately to safeguard all aircraft concerned.

4. When appropriate, broadcast by ATC communications, by radio navigation aids, and/or through aeronautical communication stations/services an emergency message to all aircraft in the vicinity of the descending aircraft. Include the following information:

(a) Location of emergency descent.

(b) Direction of flight.

(c) Type aircraft.

(d) Route if appropriate.

(e) Altitude vacated.

(f) Other information.

EXAMPLE–
"Attention all aircraft in the vicinity of Trout, a northbound D-C Ten on A-T-S Route Alfa Seven Hundred is making an emergency descent from flight level three three zero." (Repeat as you deem appropriate.)

5. If traffic conditions permit, provide traffic information to the affected aircraft.

6. Immediately after an emergency broadcast or traffic information has been made, issue appropriate clearances or instructions, as necessary, to all aircraft involved.

10–6–5. SERVICES TO RESCUE AIRCRAFT

a. Provide IFR separation between the SAR and the aircraft in distress, except when visual or radar contact has been established by the search and rescue aircraft and the pilots of both aircraft concur, IFR separation may be discontinued.

b. Clear the SAR aircraft to a fixed clearance limit rather than to the aircraft in distress, which is a moving fix. Issue route clearances that are consistent with that of the distressed aircraft.

c. Advise the rescue aircraft, as soon as practicable, of any factors that could adversely affect its mission; e.g., unfavorable weather conditions, anticipated problems, the possibility of not being able to approve an IFR descent through en route traffic, etc.

d. Advise the appropriate rescue agency of all pertinent information as it develops.

e. Forward immediately any information about the action being taken by the RCC, other organizations, or aircraft to the aircraft concerned.

f. Advise the aircraft operator of the current status of the SAR operation as soon as practicable.

g. Since prompt, correct, and complete information is the key to successful rescue operations, ensure that this information is swiftly and smoothly supplied to those organizations actively engaged in rescue operations.

Section 7. Ground Missile Emergencies

10–7–1. INFORMATION RELAY

When you receive information concerning a ground missile emergency, notify other concerned facilities and take action to have alerting advisories issued by:

a. *EN ROUTE.* Air carrier company radio stations for each VFR company aircraft which is or will be operating in the vicinity of the emergency.

b. *EN ROUTE.* FSSs adjacent to the emergency location.

c. *TERMINAL.* Relay all information concerning a ground missile emergency to the ARTCC within whose area the emergency exists and disseminate as a NOTAM.

REFERENCE–
P/CG Term – Notice to Air Missions.

10–7–2. IFR AND SVFR MINIMA

Reroute IFR and SVFR aircraft as necessary to avoid the emergency location by one of the following minima, or by greater minima when suggested by the notifying official:

a. Lateral separation– *1 mile* between the emergency location and either of the following:

1. An aircraft under radar control and the emergency location which can be accurately determined by reference to the radar scope.

2. The airspace to be protected for the route being flown.

b. Vertical separation– *6,000 feet* above the surface over the emergency location.

10–7–3. VFR MINIMA

Advise all known VFR aircraft which are, or will be, operating in the vicinity of a ground missile emergency, to avoid the emergency location by 1 mile laterally or 6,000 feet vertically, or by a greater distance or altitude, when suggested by the notifying official.

10–7–4. SMOKE COLUMN AVOIDANCE

Advise all aircraft to avoid any observed smoke columns in the vicinity of a ground missile emergency.

10–7–5. EXTENDED NOTIFICATION

EN ROUTE

When reports indicate that an emergency will exist for an extended period of time, a Notice to Air Missions may be issued.

Chapter 11. Traffic Management Procedures

Section 1. General

11–1–1. DUTY RESPONSIBILITY

a. The mission of the traffic management system is to balance air traffic demand with system capacity to ensure the maximum efficient utilization of the NAS.

b. TBFM must be used to the maximum extent feasible in preference to miles-in-trail initiatives.

c. It is recognized that the ATCS is integral in the execution of the traffic management mission.

NOTE–
Complete details of TBM, traffic management initiatives and programs can be found in FAA Order JO 7210.3, Facility Operation and Administration.

11–1–2. DUTIES AND RESPONSIBILITIES

a. Supervisory Traffic Management Coordinator–in–Charge (STMCIC) must:

1. Ensure an operational briefing is conducted at least once during the day and evening shifts. Participants must include, at a minimum, the STMCIC, Operations Supervisor–in–Charge (OSMIC)/Controller–in–Charge (CIC) and other interested personnel as designated by facility management. Discussions at the meeting should include meteorological conditions (present and forecasted), staffing, equipment status, runways in use, Airport Arrival Rate (AAR), TBM use, and Traffic Management Initiatives (TMIs) (present and anticipated).

2. Assume responsibility for TMC duties when not staffed.

3. Ensure that TBM operations and TMIs are carried out by personnel providing traffic management services.

4. Where authorized, perform EDST data entries to keep the activation status of designated EDST Airspace Configuration Elements current.

5. Perform assigned actions in the event of an EDST outage or degradation, in accordance with the requirements of FAA Order JO 7210.3, Facility Operation and Administration, and as designated by facility directive.

6. Ensure changes to TBM operations and TMIs are implemented in a timely manner.

b. OS/CIC must:

1. Keep the TMU and affected sectors apprised of situations or circumstances that may cause congestion or delays.

2. Coordinate with the TMU and personnel providing air traffic services to develop appropriate TBM operations or TMIs for sectors and airports in their area of responsibility.

3. Continuously review TBM operations and TMIs affecting their area of responsibility and coordinate with TMU for extensions, revisions, or cancellations.

4. Ensure that TBM operations and TMIs are carried out by personnel providing air traffic services.

5. Where authorized, perform data entries to keep the activation status of designated EDST Airspace Configuration Elements current.

6. Perform assigned actions in the event of an EDST outage or degradation, in accordance with the requirements of FAA Order JO 7210.3, Facility Operation and Administration, and as designated by facility directive.

7. Ensure changes to TBM operations and TMIs are implemented in a timely manner.

c. Personnel providing air traffic services must:

1. Ensure that TBM operations and TMIs are enforced within their area of responsibility. TBM operations and TMIs do not have priority over maintaining:

(a) Separation of aircraft.

(b) Procedural integrity of the sector.

2. Keep the OS/CIC and TMU apprised of situations or circumstances that may cause congestion or delays.

3. Continuously review TBM operations and TMIs affecting their area of responsibility and

coordinate with OS/CIC and TMU for extensions, revisions, or cancellations.

4. Where authorized, perform data entries to keep the activation status of designated EDST Airspace Configuration Elements current.

5. Perform assigned actions in the event of an EDST outage or degradation, in accordance with the requirements of FAA Order JO 7210.3, Facility Operation and Administration, and as designated by facility directive.

d. ARTCCs, unless otherwise coordinated, must:

1. Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to TBM operations.

2. Monitor arrival flow for potential metering actions/changes and, if necessary, initiate coordination with all facilities to discuss the change to the metering plan.

e. TRACONs, unless otherwise coordinated, must:

1. Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to TBM operations.

2. Monitor arrival flow for potential metering actions/changes and, if necessary, initiate coordination with all facilities to discuss the change to the metering plan.

3. Schedule internal departures in accordance with specific written procedures and agreements developed with overlying ARTCCs and adjacent facilities.

f. ATCTs, unless otherwise coordinated, must:

1. Monitor TBFM equipment to improve situational awareness for a system approach to TBM operations.

2. When equipped, and departure scheduling is in effect, use automation to obtain a departure release time from the TBM system.

3. When departure scheduling or Call for Release is in effect, release aircraft so they are airborne within a window that extends from 2 minutes prior and ends 1 minute after the assigned time, unless otherwise coordinated.

NOTE–
Coordination may be verbal, electronic, or written.

11–1–3. TIME BASED FLOW MANAGEMENT (TBFM)

During periods of metering, personnel providing air traffic services must:

a. Display TBFM schedule information on the situation display.

b. Comply with TBFM-generated metering times within +/- 1 minute.

1. If TBFM–generated metering time accuracy within +/– 1 minute cannot be used for specific aircraft due to significant jumps in the delay countdown timer (DCT), then TMIs may be used between those aircraft such as miles–in–trail (MIT) or minutes–in–trail (MINIT) to assist in delay absorption until stability resumes.

2. An exception to the requirement to comply within +/- 1 minute may be authorized for certain ARTCC sectors if explicitly defined in an appropriate facility directive.

c. When compliance is not possible, coordinate with OS/CIC, personnel providing traffic management services, and adjacent facilities/sectors as appropriate.

NOTE–
TBFM accuracy of generated metering times is predicated on several factors, including vectoring outside of TBFM route conformance boundaries (route recovery logic), certain trajectory ground speed calculations, and when TMU resequences a specific flight or flight list. Caution should be used in these situations to minimize impact on surrounding sector traffic and complexity levels, flight efficiencies, and user preferences.

PILOT/CONTROLLER GLOSSARY

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:
AIRBORNE REROUTE (ABRR)
ARRIVAL/DEPARTURE WINDOW (ADW)
AUTOMATED TERMINAL PROXIMITY ALERT (ATPA)
AVIATION WATCH NOTIFICATION MESSAGE
CLOSED LOOP CLEARANCE
COLD TEMPERATURE CORRECTION
CONSOLIDATED WAKE TURBULENCE (CWT)
CONSTRAINT SATISFACTION POINT (CSP)
COUPLED SCHEDULING (CS)/ EXTENDED METERING (XM)
DELAY COUNTDOWN TIMER (DCT)
DEPARTURE VIEWER
EN ROUTE TRANSITION WAYPOINT
GROUND–BASED INTERVAL MANAGEMENT–SPACING (GIM–S), SPEED ADVISORY
INTEGRATED DEPARTURE/ARRIVAL CAPABILITY (IDAC)
METER REFERENCE ELEMENT (MRE)
METER REFERENCE POINT LIST (MRP)
OPEN LOOP CLEARANCE
PLAN, EXECUTE, REVIEW, TRAIN, IMPROVE (PERTI)
PLANVIEW GRAPHICAL USER INTERFACE (PGUI)
PRE–DEPARTURE REROUTE (PDRR)
REROUTE IMPACT ASSESSMENT (RRIA)
ROUTE AMENDMENT DIALOG (RAD)
RUNWAY TRANSITION WAYPOINT
SPACE LAUNCH AND RENTRY AREA
SPEED ADVISORY
SURFACE METERING PROGRAM

SURFACE VIEWER
SUSPICIOUS UAS
TERMINAL FLIGHT DATA MANAGER (TFDM)
TERMINAL SEQUENCING AND SPACING (TSAS)
TIME–BASED MANAGEMENT (TBM)
TIMELINE GRAPHICAL USER INTERFACE (TGUI)
TOP OF DESCENT (TOD)
TRAFFIC MANAGEMENT INITIATIVE (TMI)
TRAJECTORY–BASED OPERATIONS (TBO)
WAKE RE–CATEGORIZATION (RECAT)

e. Terms Deleted:
ACTUAL CALCULATED LANDING TIME (ACLT)
AIRPORT STREAM FILTER (ASF)
ARRIVAL AIRCRAFT INTERVAL (AAI)
ARRIVAL SECTOR ADVISORY LIST
ARRIVAL SEQUENCING PROGRAM
CENTER TRACON AUTOMATION SYSTEM (CTAS)
COLD TEMPERATURE COMPENSATION
DELAY TIME
EN ROUTE SPACING PROGRAM (ESP)
FREEZE CALCULATED LANDING TIME
METER FIX TIME/SLOT TIME (MFT)
METERING POSITION(S)
METERING POSITION LIST
METER LIST
METER LIST DISPLAY INTERVAL
TENTATIVE CALCULATED LANDING TIME (TCLT)
TRANSITION WAYPOINT
VERTEX
VERTEX TIME OF ARRIVAL

f. Terms Modified:
AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER (ATCSCC)
ARRIVAL SECTOR
COMMON ROUTE
EN ROUTE TRANSITION
FLIGHT SERVICE STATION (FSS)
METER FIX ARC
METERING
NATIONAL FLIGHT DATA DIGEST (NFDD)
NOTICE TO AIRMEN (NOTAM)
OFF–ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)
RUNWAY TRANSITION
SEGMENTS OF A SID/STAR
TIME BASED FLOW MANAGEMENT (TBFM)
TRAFFIC MANAGEMENT PROGRAM ALERT
TRANSITION
WEATHER RECONNAISSANCE AREA (WRA)

g. Editorial/format changes were made where necessary. Revision bars were not used due to the insignificant nature of the changes.

A

AAR–
(See AIRPORT ARRIVAL RATE.)

ABBREVIATED IFR FLIGHT PLANS– An authorization by ATC requiring pilots to submit only that information needed for the purpose of ATC. It includes only a small portion of the usual IFR flight plan information. In certain instances, this may be only aircraft identification, location, and pilot request. Other information may be requested if needed by ATC for separation/control purposes. It is frequently used by aircraft which are airborne and desire an instrument approach or by aircraft which are on the ground and desire a climb to VFR-on-top.
(See VFR-ON-TOP.)
(Refer to AIM.)

ABEAM– An aircraft is "abeam" a fix, point, or object when that fix, point, or object is approximately 90 degrees to the right or left of the aircraft track. Abeam indicates a general position rather than a precise point.

ABORT– To terminate a preplanned aircraft maneuver; e.g., an aborted takeoff.

ABRR–
(See AIRBORNE REROUTE)

ACC [ICAO]–
(See ICAO term AREA CONTROL CENTER.)

ACCELERATE-STOP DISTANCE AVAILABLE– The runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff.

ACCELERATE-STOP DISTANCE AVAILABLE [ICAO]– The length of the take-off run available plus the length of the stopway if provided.

ACDO–
(See AIR CARRIER DISTRICT OFFICE.)

ACKNOWLEDGE– Let me know that you have received and understood this message.

ACL–
(See AIRCRAFT LIST.)

ACLS–
(See AUTOMATIC CARRIER LANDING SYSTEM.)

ACROBATIC FLIGHT– An intentional maneuver involving an abrupt change in an aircraft's attitude, an abnormal attitude, or abnormal acceleration not necessary for normal flight.
(See ICAO term ACROBATIC FLIGHT.)
(Refer to 14 CFR Part 91.)

ACROBATIC FLIGHT [ICAO]– Maneuvers intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed.

ACTIVE RUNWAY–
(See RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY.)

ACTUAL NAVIGATION PERFORMANCE (ANP)–
(See REQUIRED NAVIGATION PERFORMANCE.)

ADDITIONAL SERVICES– Advisory information provided by ATC which includes but is not limited to the following:

a. Traffic advisories.

b. Vectors, when requested by the pilot, to assist aircraft receiving traffic advisories to avoid observed traffic.

c. Altitude deviation information of 300 feet or more from an assigned altitude as observed on a verified (reading correctly) automatic altitude readout (Mode C).

d. Advisories that traffic is no longer a factor.

e. Weather and chaff information.

f. Weather assistance.

g. Bird activity information.

h. Holding pattern surveillance. Additional services are provided to the extent possible contingent only upon the controller's capability to fit them into the performance of higher priority duties and on the basis of limitations of the radar, volume of traffic, frequency congestion, and controller workload. The controller has complete discretion for determining if he/she is able to provide or continue to provide a

service in a particular case. The controller's reason not to provide or continue to provide a service in a particular case is not subject to question by the pilot and need not be made known to him/her.

(See TRAFFIC ADVISORIES.)

(Refer to AIM.)

ADF–

(See AUTOMATIC DIRECTION FINDER.)

ADIZ–

(See AIR DEFENSE IDENTIFICATION ZONE.)

ADLY–

(See ARRIVAL DELAY.)

ADMINISTRATOR– The Federal Aviation Administrator or any person to whom he/she has delegated his/her authority in the matter concerned.

ADR–

(See AIRPORT DEPARTURE RATE.)

ADS [ICAO]–

(See ICAO term AUTOMATIC DEPENDENT SURVEILLANCE.)

ADS–B–

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST.)

ADS–C–

(See AUTOMATIC DEPENDENT SURVEILLANCE–CONTRACT.)

ADVISE INTENTIONS– Tell me what you plan to do.

ADVISORY– Advice and information provided to assist pilots in the safe conduct of flight and aircraft movement.

(See ADVISORY SERVICE.)

ADVISORY FREQUENCY– The appropriate frequency to be used for Airport Advisory Service.

(See LOCAL AIRPORT ADVISORY.)

(See UNICOM.)

(Refer to ADVISORY CIRCULAR NO. 90-66.)

(Refer to AIM.)

ADVISORY SERVICE– Advice and information provided by a facility to assist pilots in the safe conduct of flight and aircraft movement.

(See ADDITIONAL SERVICES.)

(See LOCAL AIRPORT ADVISORY.)

(See RADAR ADVISORY.)

(See SAFETY ALERT.)

(See TRAFFIC ADVISORIES.)

(Refer to AIM.)

ADW–

(See ARRIVAL DEPARTURE WINDOW)

AERIAL REFUELING– A procedure used by the military to transfer fuel from one aircraft to another during flight.

(Refer to VFR/IFR Wall Planning Charts.)

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

AERODROME BEACON [ICAO]– Aeronautical beacon used to indicate the location of an aerodrome from the air.

AERODROME CONTROL SERVICE [ICAO]– Air traffic control service for aerodrome traffic.

AERODROME CONTROL TOWER [ICAO]– A unit established to provide air traffic control service to aerodrome traffic.

AERODROME ELEVATION [ICAO]– The elevation of the highest point of the landing area.

AERODROME TRAFFIC CIRCUIT [ICAO]– The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

AERONAUTICAL BEACON– A visual NAVAID displaying flashes of white and/or colored light to indicate the location of an airport, a heliport, a landmark, a certain point of a Federal airway in mountainous terrain, or an obstruction.

(See AIRPORT ROTATING BEACON.)

(Refer to AIM.)

AERONAUTICAL CHART– A map used in air navigation containing all or part of the following: topographic features, hazards and obstructions, 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.)

AERONAUTICAL INFORMATION SERVICES (AIS)– A facility in Silver Spring, MD, 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.)

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 Air Missions (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 AIR MISSIONS.)

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.

e. Air Traffic Organization (ATO) Space Operations and Unmanned Aircraft System (UAS); the Office of Primary Responsibility (OPR) for all space and upper class E tactical operations in the National Airspace System (NAS).

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.

AIRBORNE REROUTE (ABRR)– A capability within the Traffic Flow Management System used for the timely development and implementation of tactical reroutes for airborne aircraft. This capability defines a set of aircraft–specific reroutes that address a certain traffic flow problem and then electronically transmits them to En Route Automation Modernization (ERAM) for execution by the appropriate sector controllers.

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 CONVECTIVE SIGMET.)
(See CWA.)
(See SAW.)
(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 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 Expect 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.)

AIS–
(See AERONAUTICAL INFORMATION SERVICES.)

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 30 NM arc centered on the IF bounded by a straight line extending through the IF perpendicular to the intermediate course.

2. LEFT BASE AREA– A 30 NM arc centered on the right corner IAF. The area shares a boundary with the straight-in area except that it extends out for 30 NM 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 30 NM arc centered on the left corner IAF. The area shares a boundary with the straight-in area except that it extends out for 30 NM 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.

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 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/DEPARTURE WINDOW (ADW)– A depiction presented on an air traffic control display, used by the controller to prevent possible conflicts between arrivals to, and departures from, a runway. The ADW identifies that point on the final approach course by which a departing aircraft must have begun takeoff.

ARRIVAL SECTOR (En Route)– An operational control sector containing one or more meter fixes on or near the TRACON boundary.

ARRIVAL TIME– The time an aircraft touches down on arrival.

ARSR–
(See AIR ROUTE SURVEILLANCE RADAR.)

ARTCC–
(See AIR ROUTE TRAFFIC CONTROL CENTER.)

ASDA–
(See ACCELERATE-STOP DISTANCE AVAILABLE.)

ASDA [ICAO]–
(See ICAO Term ACCELERATE-STOP DISTANCE AVAILABLE.)

ASDE–
(See AIRPORT SURFACE DETECTION EQUIPMENT.)

ASLAR–
(See AIRCRAFT SURGE LAUNCH AND RECOVERY.)

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.)

ATPA–
(See AUTOMATED TERMINAL PROXIMITY ALERT.)

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 EMERGENCY DESCENT–
(See EMERGENCY DESCENT MODE.)

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 TERMINAL PROXIMITY ALERT (ATPA)– Monitors the separation of aircraft on the Final Approach Course (FAC), displaying a graphical notification (cone and/or mileage) when a potential loss of separation is detected. The warning cone (Yellow) will display at 45 seconds and the alert cone (Red) will display at 24 seconds prior to predicted loss of separation. Current distance between two aircraft on final will be displayed in line 3 of the full data block of the trailing aircraft in corresponding colors.

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 WATCH NOTIFICATION MESSAGE– The Storm Prediction Center (SPC) issues Aviation Watch Notification Messages (SAW) to provide an area threat alert for the aviation meteorology community to forecast organized severe thunderstorms that may produce tornadoes, large hail, and/or convective damaging winds as indicated in Public Watch Notification Messages within the Continental U.S. A SAW message provides a description of the type of watch issued by SPC, a valid time, an approximation of the area in a watch, and primary hazard(s).

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.)

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.

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 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 AIRMET.)
(See CONVECTIVE SIGMET.)
(See SAW.)
(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.)

CERTIFICATE OF WAIVER OR AUTHORIZATION (COA)– An FAA grant of approval for a specific flight operation or airspace authorization or waiver.

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 LOOP CLEARANCE– A vector or reroute clearance that includes a return to route point and updates ERAM to accurately reflect the anticipated route (e.g., a QU route pick that anticipates length of vector and includes the next fix that ties into the route of flight.)

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.)

COA–

(See CERTIFICATE OF WAIVER OR AUTHORIZATION.)

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 CORRECTION– A correction in feet, based on height above airport and temperature, that is added to the aircraft's indicated altitude to offset the effect of cold temperature on true altitude.

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–
(See SEGMENTS OF A SID/STAR)

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 90-66, Non–Towered Airport Flight Operations.)

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 conflictions 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 NAVAID used principally for transoceanic navigations.

CONSOLIDATED WAKE TURBULENCE (CWT)– A version of RECAT that has nine categories, A through I, that refines the grouping of aircraft while optimizing wake turbulence separation.

CONSTRAINT SATISFACTION POINT (CSP)– Meter Reference Elements (MREs) that are actively scheduled by TBFM. Constraint satisfaction occurs when the Scheduled Time of Arrival generated for each metered flight conforms to all the scheduling constraints specified at all the applicable CSPs.

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 NM radius, a circle with a 10 NM 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 $^{4}/_{10}$ (40%) or more, and hail $^{3}/_{4}$ inch or greater.

(See AIRMET.)
(See CWA.)
(See SAW.)
(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.

COUPLED SCHEDULING (CS)/ EXTENDED METERING (XM)– Adds additional Constraint Satisfaction Points for metered aircraft along their route. This provides the ability to merge flows upstream from the meter fix and results in a more optimal distribution of delays over a greater distance from the airport, increased meter list accuracy, and more accurate delivery to the meter fix.

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.

CSP–

(See CONSTRAINT SATISFACTION POINT)

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.)

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.)

CWT–

(See CONSOLIDATED WAKE TURBULENCE.)

D

D–ATIS–
(See DIGITAL-AUTOMATIC TERMINAL INFORMATION SERVICE.)

D–ATIS [ICAO]–
(See ICAO Term DATA LINK AUTOMATIC TERMINAL INFORMATION SERVICE.)

DA [ICAO]–
(See ICAO Term DECISION ALTITUDE/DECISION HEIGHT.)

DAIR–
(See DIRECT ALTITUDE AND IDENTITY READOUT.)

DANGER AREA [ICAO]– An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Note: The term "Danger Area" is not used in reference to areas within the United States or any of its possessions or territories.

DAS–
(See DELAY ASSIGNMENT.)

DATA BLOCK–
(See ALPHANUMERIC DISPLAY.)

DATA LINK AUTOMATIC TERMINAL INFORMATION SERVICE (D–ATIS) [ICAO]– The provision of ATIS via data link.

DCT–
(See DELAY COUNTDOWN TIMER.)

DEAD RECKONING– Dead reckoning, as applied to flying, is the navigation of an airplane solely by means of computations based on airspeed, course, heading, wind direction, and speed, groundspeed, and elapsed time.

DECISION ALTITUDE/DECISION HEIGHT [ICAO Annex 6]- A specified altitude or height (A/H) in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.
1. Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.
2. Category II and III minima are expressed as a DH and not a DA. Minima is assessed by reference to a radio altimeter and not a barometric altimeter, which makes the minima a DH.
3. The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.

DECISION ALTITUDE (DA)– A specified altitude (mean sea level (MSL)) on an instrument approach procedure (ILS, GLS, vertically guided RNAV) at which the pilot must decide whether to continue the approach or initiate an immediate missed approach if the pilot does not see the required visual references.

DECISION HEIGHT (DH)– With respect to the operation of aircraft, means the height at which a decision must be made during an ILS or PAR instrument approach to either continue the approach or to execute a missed approach.
(See ICAO term DECISION ALTITUDE/DECISION HEIGHT.)

DECODER– The device used to decipher signals received from ATCRBS transponders to effect their display as select codes.
(See CODES.)
(See RADAR.)

DEFENSE AREA– Any airspace of the contiguous United States that is not an ADIZ in which the control of aircraft is required for reasons of national security.

DEFENSE VISUAL FLIGHT RULES– Rules applicable to flights within an ADIZ conducted under the visual flight rules in 14 CFR Part 91.
(See AIR DEFENSE IDENTIFICATION ZONE.)
(Refer to 14 CFR Part 91.)
(Refer to 14 CFR Part 99.)

DELAY ASSIGNMENT (DAS)– Delays are distributed to aircraft based on the traffic management program parameters. The delay assignment is calculated in 15–minute increments and appears as a table in Traffic Flow Management System (TFMS).

DELAY COUNTDOWN TIMER (DCT)– The display of the delay that must be absorbed by a flight prior to crossing a Meter Reference Element (MRE) to meet the TBFM Scheduled Time of Arrival (STA).

It is calculated by taking the difference between the frozen STA and the Estimated Time of Arrival (ETA).

DELAY INDEFINITE (REASON IF KNOWD) EXPECT FURTHER CLEARANCE (TIME)– Used by ATC to inform a pilot when an accurate estimate of the delay time and the reason for the delay cannot immediately be determined; e.g., a disabled aircraft on the runway, terminal or center area saturation, weather below landing minimums, etc.

(See EXPECT FURTHER CLEARANCE (TIME).)

DEPARTURE CENTER– The ARTCC having jurisdiction for the airspace that generates a flight to the impacted airport.

DEPARTURE CONTROL– A function of an approach control facility providing air traffic control service for departing IFR and, under certain conditions, VFR aircraft.

(See APPROACH CONTROL FACILITY.)
(Refer to AIM.)

DEPARTURE SEQUENCING PROGRAM– A program designed to assist in achieving a specified interval over a common point for departures.

DEPARTURE TIME– The time an aircraft becomes airborne.

DEPARTURE VIEWER– A capability within the Traffic Flow Management System (TFMS) that provides combined displays for monitoring departure by fixes and departure airports. Traffic management personnel can customize the displays by selecting the departure airports and fixes of interest. The information displayed is the demand for the resource (fix or departure airport) in time bins with the flight list and a flight history for one flight at a time. From the display, flights can be selected for route amendment, one or more at a time, and the Route Amendment Dialogue (RAD) screen automatically opens for easy route selection and execution. Reroute options are based on Coded Departure Route (CDR) database and Trajectory Options Set (TOS) (when available).

DESCEND VIA– An abbreviated ATC clearance that requires compliance with a published procedure lateral path and associated speed restrictions and provides a pilot-discretion descent to comply with published altitude restrictions.

DESCENT SPEED ADJUSTMENTS– Speed deceleration calculations made to determine an accurate VTA. These calculations start at the transition point and use arrival speed segments to the vertex.

DESIGNATED COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) AREA– In Alaska, in addition to being designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating airport traffic control tower, a CTAF may also be designated for the purpose of carrying out advisory practices for operations in and through areas with a high volume of VFR traffic.

DESIRED COURSE–

a. True– A predetermined desired course direction to be followed (measured in degrees from true north).

b. Magnetic– A predetermined desired course direction to be followed (measured in degrees from local magnetic north).

DESIRED TRACK– The planned or intended track between two waypoints. It is measured in degrees from either magnetic or true north. The instantaneous angle may change from point to point along the great circle track between waypoints.

DETRESFA (DISTRESS PHASE) [ICAO]– The code word used to designate an emergency phase wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

DEVIATIONS–

a. A departure from a current clearance, such as an off course maneuver to avoid weather or turbulence.

b. Where specifically authorized in the CFRs and requested by the pilot, ATC may permit pilots to deviate from certain regulations.

DH–

(See DECISION HEIGHT.)

DH [ICAO]–

(See ICAO Term DECISION ALTITUDE/ DECISION HEIGHT.)

DIGITAL-AUTOMATIC TERMINAL INFORMATION SERVICE (D-ATIS)– The service provides text messages to aircraft, airlines, and other users outside the standard reception range of conventional ATIS via landline and data link communications to the cockpit. Also, the service provides a computer–synthesized voice message that can be transmitted to all aircraft within range of existing transmitters. The Terminal Data Link System (TDLS) D-ATIS

application uses weather inputs from local automated weather sources or manually entered meteorological data together with preprogrammed menus to provide standard information to users. Airports with D-ATIS capability are listed in the Chart Supplement U.S.

DIGITAL TARGET– A computer–generated symbol representing an aircraft's position, based on a primary return or radar beacon reply, shown on a digital display.

DIGITAL TERMINAL AUTOMATION SYSTEM (DTAS)– A system where digital radar and beacon data is presented on digital displays and the operational program monitors the system performance on a real–time basis.

DIGITIZED TARGET– A computer–generated indication shown on an analog radar display resulting from a primary radar return or a radar beacon reply.

DIRECT– Straight line flight between two navigational aids, fixes, points, or any combination thereof. When used by pilots in describing off-airway routes, points defining direct route segments become compulsory reporting points unless the aircraft is under radar contact.

DIRECTLY BEHIND– An aircraft is considered to be operating directly behind when it is following the actual flight path of the lead aircraft over the surface of the earth except when applying wake turbulence separation criteria.

DISCRETE BEACON CODE–
(See DISCRETE CODE.)

DISCRETE CODE– As used in the Air Traffic Control Radar Beacon System (ATCRBS), any one of the 4096 selectable Mode 3/A aircraft transponder codes except those ending in zero zero; e.g., discrete codes: 0010, 1201, 2317, 7777; nondiscrete codes: 0100, 1200, 7700. Nondiscrete codes are normally reserved for radar facilities that are not equipped with discrete decoding capability and for other purposes such as emergencies (7700), VFR aircraft (1200), etc.
(See RADAR.)
(Refer to AIM.)

DISCRETE FREQUENCY– A separate radio frequency for use in direct pilot-controller communications in air traffic control which reduces frequency congestion by controlling the number of aircraft operating on a particular frequency at one time. Discrete frequencies are normally designated for each control sector in en route/terminal ATC facilities. Discrete frequencies are listed in the Chart Supplement U.S. and the DOD FLIP IFR En Route Supplement.
(See CONTROL SECTOR.)

DISPLACED THRESHOLD– A threshold that is located at a point on the runway other than the designated beginning of the runway.
(See THRESHOLD.)
(Refer to AIM.)

DISTANCE MEASURING EQUIPMENT (DME)– Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.
(See TACAN.)
(See VORTAC.)

DISTRESS– A condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.

DIVE BRAKES–
(See SPEED BRAKES.)

DIVERSE VECTOR AREA– In a radar environment, that area in which a prescribed departure route is not required as the only suitable route to avoid obstacles. The area in which random radar vectors below the MVA/MIA, established in accordance with the TERPS criteria for diverse departures, obstacles and terrain avoidance, may be issued to departing aircraft.

DIVERSION (DVRSN)– Flights that are required to land at other than their original destination for reasons beyond the control of the pilot/company, e.g. periods of significant weather.

DME–
(See DISTANCE MEASURING EQUIPMENT.)

DME FIX– A geographical position determined by reference to a navigational aid which provides distance and azimuth information. It is defined by a specific distance in nautical miles and a radial, azimuth, or course (i.e., localizer) in degrees magnetic from that aid.
(See DISTANCE MEASURING EQUIPMENT.)
(See FIX.)

DME SEPARATION– Spacing of aircraft in terms of distances (nautical miles) determined by reference to distance measuring equipment (DME).
(See DISTANCE MEASURING EQUIPMENT.)

DOD FLIP– Department of Defense Flight Information Publications used for flight planning, en route, and terminal operations. FLIP is produced by the National Geospatial–Intelligence Agency (NGA) for world-wide use. United States Government Flight Information Publications (en route charts and instrument approach procedure charts) are incorporated in DOD FLIP for use in the National Airspace System (NAS).

DOMESTIC AIRSPACE– Airspace which overlies the continental land mass of the United States plus Hawaii and U.S. possessions. Domestic airspace extends to 12 miles offshore.

DOMESTIC NOTICE– A special notice or notice containing graphics or plain language text pertaining to almost every aspect of aviation, such as military training areas, large scale sporting events, air show information, Special Traffic Management Programs (STMPs), and airport–specific information. These notices are applicable to operations within the United States and can be found on the Domestic Notices website.

DOWNBURST– A strong downdraft which induces an outburst of damaging winds on or near the ground. Damaging winds, either straight or curved, are highly divergent. The sizes of downbursts vary from 1/2 mile or less to more than 10 miles. An intense downburst often causes widespread damage. Damaging winds, lasting 5 to 30 minutes, could reach speeds as high as 120 knots.

DOWNWIND LEG–
(See TRAFFIC PATTERN.)

DP–
(See INSTRUMENT DEPARTURE PROCEDURE.)

DRAG CHUTE– A parachute device installed on certain aircraft which is deployed on landing roll to assist in deceleration of the aircraft.

DROP ZONE– Any pre-determined area upon which parachutists or objects land after making an intentional parachute jump or drop.
(Refer to 14 CFR §105.3, Definitions)

DSP–
(See DEPARTURE SEQUENCING PROGRAM.)

DTAS–
(See DIGITAL TERMINAL AUTOMATION SYSTEM.)

DUE REGARD– A phase of flight wherein an aircraft commander of a State-operated aircraft assumes responsibility to separate his/her aircraft from all other aircraft.
(See also FAA Order JO 7110.65, Para 1–2–1, WORD MEANINGS.)

DUTY RUNWAY–
(See RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY.)

DVA–
(See DIVERSE VECTOR AREA.)

DVFR–
(See DEFENSE VISUAL FLIGHT RULES.)

DVFR FLIGHT PLAN– A flight plan filed for a VFR aircraft which intends to operate in airspace within which the ready identification, location, and control of aircraft are required in the interest of national security.

DVRSN–
(See DIVERSION.)

DYNAMIC– Continuous review, evaluation, and change to meet demands.

DYNAMIC RESTRICTIONS– Those restrictions imposed by the local facility on an “as needed” basis to manage unpredictable fluctuations in traffic demands.

E

EAS–
(See EN ROUTE AUTOMATION SYSTEM.)

EDCT–
(See EXPECT DEPARTURE CLEARANCE TIME.)

EDST–
(See EN ROUTE DECISION SUPPORT TOOL)

EFC–
(See EXPECT FURTHER CLEARANCE (TIME).)

ELT–
(See EMERGENCY LOCATOR TRANSMITTER.)

EMERGENCY– A distress or an urgency condition.

EMERGENCY AUTOLAND SYSTEM– This system, if activated, will determine an optimal airport, plot a course, broadcast the aircraft's intentions, fly to the airport, land, and (depending on the model) shut down the engines. Though the system will broadcast the aircraft's intentions, the controller should assume that transmissions to the aircraft will not be acknowledged.

EMERGENCY DESCENT MODE– This automated system senses conditions conducive to hypoxia (cabin depressurization). If an aircraft is equipped and the system is activated, it is designed to turn the aircraft up to 90 degrees, then descend to a lower altitude and level off, giving the pilot(s) time to recover.

EMERGENCY LOCATOR TRANSMITTER (ELT)– A radio transmitter attached to the aircraft structure which operates from its own power source on 121.5 MHz and 243.0 MHz. It aids in locating downed aircraft by radiating a downward sweeping audio tone, 2-4 times per second. It is designed to function without human action after an accident.
(Refer to 14 CFR Part 91.)
(Refer to AIM.)

E-MSAW–
(See EN ROUTE MINIMUM SAFE ALTITUDE WARNING.)

ENHANCED FLIGHT VISION SYSTEM (EFVS)– An EFVS is an installed aircraft system which uses an electronic means to provide a display of the forward external scene topography (the natural or man–made features of a place or region especially in a way to show their relative positions and elevation) through the use of imaging sensors, including but not limited to forward–looking infrared, millimeter wave radiometry, millimeter wave radar, or low–light level image intensification. An EFVS includes the display element, sensors, computers and power supplies, indications, and controls. An operator's authorization to conduct an EFVS operation may have provisions which allow pilots to conduct IAPs when the reported weather is below minimums prescribed on the IAP to be flown.

EN ROUTE AIR TRAFFIC CONTROL SERVICES– Air traffic control service provided aircraft on IFR flight plans, generally by centers, when these aircraft are operating between departure and destination terminal areas. When equipment, capabilities, and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.
(See AIR ROUTE TRAFFIC CONTROL CENTER.)
(Refer to AIM.)

EN ROUTE AUTOMATION SYSTEM (EAS)– The complex integrated environment consisting of situation display systems, surveillance systems and flight data processing, remote devices, decision support tools, and the related communications equipment that form the heart of the automated IFR air traffic control system. It interfaces with automated terminal systems and is used in the control of en route IFR aircraft.
(Refer to AIM.)

EN ROUTE CHARTS–
(See AERONAUTICAL CHART.)

EN ROUTE DECISION SUPPORT TOOL (EDST)– An automated tool provided at each Radar Associate position in selected En Route facilities. This tool utilizes flight and radar data to determine present and future trajectories for all active and proposal aircraft and provides enhanced automated flight data management.

EN ROUTE DESCENT– Descent from the en route cruising altitude which takes place along the route of flight.

EN ROUTE HIGH ALTITUDE CHARTS–
(See AERONAUTICAL CHART.)

EN ROUTE LOW ALTITUDE CHARTS–
(See AERONAUTICAL CHART.)

EN ROUTE MINIMUM SAFE ALTITUDE WARNING (E–MSAW)– A function of the EAS that aids the controller by providing an alert when a tracked aircraft is below or predicted by the computer to go below a predetermined minimum IFR altitude (MIA).

EN ROUTE TRANSITION–
(See SEGMENTS OF A SID/STAR.)

EN ROUTE TRANSITION WAYPOINT
(See SEGMENTS OF A SID/STAR.)

EST–
(See ESTIMATED.)

ESTABLISHED– To be stable or fixed at an altitude or on a course, route, route segment, heading, instrument approach or departure procedure, etc.

ESTABLISHED ON RNP (EoR) CONCEPT– A system of au . . thorized instrument approaches, ATC procedures, surveillance, and communication requirements that allow aircraft operations to be safely conducted with approved reduced separation criteria once aircraft are established on a PBN segment of a published instrument flight procedure.

ESTIMATED (EST)–When used in NOTAMs "EST" is a contraction that is used by the issuing authority only when the condition is expected to return to service prior to the expiration time. Using "EST" lets the user know that this NOTAM has the possibility of returning to service earlier than the expiration time. Any NOTAM which includes an "EST" will be auto–expired at the designated expiration time.

ESTIMATED ELAPSED TIME [ICAO]– The estimated time required to proceed from one significant point to another.
(See ICAO Term TOTAL ESTIMATED ELAPSED TIME.)

ESTIMATED OFF-BLOCK TIME [ICAO]– The estimated time at which the aircraft will commence movement associated with departure.

ESTIMATED POSITION ERROR (EPE)–
(See Required Navigation Performance)

ESTIMATED TIME OF ARRIVAL– The time the flight is estimated to arrive at the gate (scheduled operators) or the actual runway on times for nonscheduled operators.

ESTIMATED TIME EN ROUTE– The estimated flying time from departure point to destination (lift-off to touchdown).

ETA–
(See ESTIMATED TIME OF ARRIVAL.)

ETE–
(See ESTIMATED TIME EN ROUTE.)

EXECUTE MISSED APPROACH– Instructions issued to a pilot making an instrument approach which means continue inbound to the missed approach point and execute the missed approach procedure as described on the Instrument Approach Procedure Chart or as previously assigned by ATC. The pilot may climb immediately to the altitude specified in the missed approach procedure upon making a missed approach. No turns should be initiated prior to reaching the missed approach point. When conducting an ASR or PAR approach, execute the assigned missed approach procedure immediately upon receiving instructions to "execute missed approach."
(Refer to AIM.)

EXPECT (ALTITUDE) AT (TIME) or (FIX)– Used under certain conditions to provide a pilot with an altitude to be used in the event of two-way communications failure. It also provides altitude information to assist the pilot in planning.
(Refer to AIM.)

EXPECT DEPARTURE CLEARANCE TIME (EDCT)– The runway release time assigned to an aircraft in a traffic management program and shown on the flight progress strip as an EDCT.
(See GROUND DELAY PROGRAM.)

EXPECT FURTHER CLEARANCE (TIME)– The time a pilot can expect to receive clearance beyond a clearance limit.

EXPECT FURTHER CLEARANCE VIA (AIRWAYS, ROUTES OR FIXES)– Used to inform a pilot of the routing he/she can expect if any part of the route beyond a short range clearance limit differs from that filed.

EXPEDITE– Used by ATC when prompt compliance is required to avoid the development of an imminent situation. Expedite climb/descent normally indicates to a pilot that the approximate best rate of climb/descent should be used without requiring an exceptional change in aircraft handling characteristics.

F

FAF–
(See FINAL APPROACH FIX.)

FALLEN HERO– Remains of fallen members of the United States military are often returned home by aircraft. These flights may be identified with the phrase "FALLEN HERO" added to the remarks section of the flight plan, or they may be transmitted via air/ground communications. If able, these flights will receive priority handling.

FAST FILE– An FSS system whereby a pilot files a flight plan via telephone that is recorded and later transcribed for transmission to the appropriate air traffic facility. (Alaska only.)

FAWP– Final Approach Waypoint

FEATHERED PROPELLER– A propeller whose blades have been rotated so that the leading and trailing edges are nearly parallel with the aircraft flight path to stop or minimize drag and engine rotation. Normally used to indicate shutdown of a reciprocating or turboprop engine due to malfunction.

FEDERAL AIRWAYS–
(See LOW ALTITUDE AIRWAY STRUCTURE.)

FEEDER FIX– The fix depicted on Instrument Approach Procedure Charts which establishes the starting point of the feeder route.

FEEDER ROUTE– A route depicted on instrument approach procedure charts to designate routes for aircraft to proceed from the en route structure to the initial approach fix (IAF).
(See INSTRUMENT APPROACH PROCEDURE.)

FERRY FLIGHT– A flight for the purpose of:

a. Returning an aircraft to base.

b. Delivering an aircraft from one location to another.

c. Moving an aircraft to and from a maintenance base. Ferry flights, under certain conditions, may be conducted under terms of a special flight permit.

FIELD ELEVATION–
(See AIRPORT ELEVATION.)

FILED– Normally used in conjunction with flight plans, meaning a flight plan has been submitted to ATC.

FILED EN ROUTE DELAY– Any of the following preplanned delays at points/areas along the route of flight which require special flight plan filing and handling techniques.

a. Terminal Area Delay. A delay within a terminal area for touch-and-go, low approach, or other terminal area activity.

b. Special Use Airspace Delay. A delay within a Military Operations Area, Restricted Area, Warning Area, or ATC Assigned Airspace.

c. Aerial Refueling Delay. A delay within an Aerial Refueling Track or Anchor.

FILED FLIGHT PLAN– The flight plan as filed with an ATS unit by the pilot or his/her designated representative without any subsequent changes or clearances.

FINAL– Commonly used to mean that an aircraft is on the final approach course or is aligned with a landing area.
(See FINAL APPROACH COURSE.)
(See FINAL APPROACH-IFR.)
(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

FINAL APPROACH [ICAO]– That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified.

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

b. At the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:

1. A landing can be made; or

2. A missed approach procedure is initiated.

FINAL APPROACH COURSE– A bearing/radial/track of an instrument approach leading to a runway or an extended runway centerline all without regard to distance.

FINAL APPROACH FIX– The fix from which the final approach (IFR) to an airport is executed and

which identifies the beginning of the final approach segment. It is designated on Government charts by the Maltese Cross symbol for nonprecision approaches and the lightning bolt symbol, designating the PFAF, for precision approaches; or when ATC directs a lower-than-published glideslope/path or vertical path intercept altitude, it is the resultant actual point of the glideslope/path or vertical path intercept.

(See FINAL APPROACH POINT.)

(See GLIDESLOPE INTERCEPT ALTITUDE.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

FINAL APPROACH-IFR– The flight path of an aircraft which is inbound to an airport on a final instrument approach course, beginning at the final approach fix or point and extending to the airport or the point where a circle-to-land maneuver or a missed approach is executed.

(See FINAL APPROACH COURSE.)

(See FINAL APPROACH FIX.)

(See FINAL APPROACH POINT.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

(See ICAO term FINAL APPROACH.)

FINAL APPROACH POINT– The point, applicable only to a nonprecision approach with no depicted FAF (such as an on airport VOR), where the aircraft is established inbound on the final approach course from the procedure turn and where the final approach descent may be commenced. The FAP serves as the FAF and identifies the beginning of the final approach segment.

(See FINAL APPROACH FIX.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

FINAL APPROACH SEGMENT–

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

FINAL APPROACH SEGMENT [ICAO]– That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

FINAL CONTROLLER– The controller providing information and final approach guidance during PAR and ASR approaches utilizing radar equipment.

(See RADAR APPROACH.)

FINAL GUARD SERVICE– A value added service provided in conjunction with LAA/RAA only during periods of significant and fast changing weather conditions that may affect landing and takeoff operations.

FINAL MONITOR AID– A high resolution color display that is equipped with the controller alert system hardware/software used to monitor the no transgression zone (NTZ) during simultaneous parallel approach operations. The display includes alert algorithms providing the target predictors, a color change alert when a target penetrates or is predicted to penetrate the no transgression zone (NTZ), synthesized voice alerts, and digital mapping.

(See RADAR APPROACH.)

FINAL MONITOR CONTROLLER– Air Traffic Control Specialist assigned to radar monitor the flight path of aircraft during simultaneous parallel (approach courses spaced less than 9000 feet/9200 feet above 5000 feet) and simultaneous close parallel approach operations. Each runway is assigned a final monitor controller during simultaneous parallel and simultaneous close parallel ILS approaches.

FIR–

(See FLIGHT INFORMATION REGION.)

FIRST TIER CENTER– An ARTCC immediately adjacent to the impacted center.

FIS–B–

(See FLIGHT INFORMATION SERVICE–BROADCAST.)

FIX– A geographical position determined by visual reference to the surface, by reference to one or more radio NAVAIDs, by celestial plotting, or by another navigational device.

FIX BALANCING– A process whereby aircraft are evenly distributed over several available arrival fixes reducing delays and controller workload.

FLAG– A warning device incorporated in certain airborne navigation and flight instruments indicating that:

a. Instruments are inoperative or otherwise not operating satisfactorily, or

b. Signal strength or quality of the received signal falls below acceptable values.

FLAG ALARM–

(See FLAG.)

FLAMEOUT– An emergency condition caused by a loss of engine power.

FLAMEOUT PATTERN– An approach normally conducted by a single-engine military aircraft experiencing loss or anticipating loss of engine power or control. The standard overhead approach starts at a relatively high altitude over a runway ("high key") followed by a continuous 180 degree turn to a high, wide position ("low key") followed by a continuous 180 degree turn final. The standard straight-in pattern starts at a point that results in a straight-in approach with a high rate of descent to the runway. Flameout approaches terminate in the type approach requested by the pilot (normally fullstop).

FLIGHT CHECK– A call sign prefix used by FAA aircraft engaged in flight inspection/certification of navigational aids and flight procedures. The word "recorded" may be added as a suffix; e.g., "Flight Check 320 recorded" to indicate that an automated flight inspection is in progress in terminal areas.

(See FLIGHT INSPECTION.)

(Refer to AIM.)

FLIGHT FOLLOWING–

(See TRAFFIC ADVISORIES.)

FLIGHT INFORMATION REGION– An airspace of defined dimensions within which Flight Information Service and Alerting Service are provided.

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

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

FLIGHT INFORMATION SERVICE– A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

FLIGHT INFORMATION SERVICE–BROADCAST (FIS–B)– A ground broadcast service provided through the ADS–B Broadcast Services network over the UAT data link that operates on 978 MHz. The FIS–B system provides pilots and flight crews of properly equipped aircraft with a cockpit display of certain aviation weather and aeronautical information.

FLIGHT INSPECTION– Inflight investigation and evaluation of a navigational aid to determine whether it meets established tolerances.

(See FLIGHT CHECK.)

(See NAVIGATIONAL AID.)

FLIGHT LEVEL– A level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits that represent hundreds of feet. For example, flight level (FL) 250 represents a barometric altimeter indication of 25,000 feet; FL 255, an indication of 25,500 feet.

(See ICAO term FLIGHT LEVEL.)

FLIGHT LEVEL [ICAO]– A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 hPa (1013.2 mb), and is separated from other such surfaces by specific pressure intervals.

Note 1: A pressure type altimeter calibrated in accordance with the standard atmosphere:

a. When set to a QNH altimeter setting, will indicate altitude;

b. When set to a QFE altimeter setting, will indicate height above the QFE reference datum; and

c. When set to a pressure of 1013.2 hPa (1013.2 mb), may be used to indicate flight levels.

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

FLIGHT LINE– A term used to describe the precise movement of a civil photogrammetric aircraft along a predetermined course(s) at a predetermined altitude during the actual photographic run.

FLIGHT MANAGEMENT SYSTEMS– A computer system that uses a large data base to allow routes to be preprogrammed and fed into the system by means of a data loader. The system is constantly updated with respect to position accuracy by reference to conventional navigation aids. The sophisticated program and its associated data base ensures that the most appropriate aids are automatically selected during the information update cycle.

FLIGHT PATH– A line, course, or track along which an aircraft is flying or intended to be flown.

(See COURSE.)

(See TRACK.)

FLIGHT PLAN– Specified information relating to the intended flight of an aircraft that is filed

electronically, orally, or in writing with an FSS, third–party vendor, or an ATC facility.

(See FAST FILE.)
(See FILED.)
(Refer to AIM.)

FLIGHT PLAN AREA (FPA)– The geographical area assigned to a flight service station (FSS) for the purpose of establishing primary responsibility for services that may include search and rescue for VFR aircraft, issuance of NOTAMs, pilot briefings, inflight services, broadcast services, emergency services, flight data processing, international operations, and aviation weather services. Large consolidated FSS facilities may combine FPAs into larger areas of responsibility (AOR).

(See FLIGHT SERVICE STATION.)
(See TIE-IN FACILITY.)

FLIGHT RECORDER– A general term applied to any instrument or device that records information about the performance of an aircraft in flight or about conditions encountered in flight. Flight recorders may make records of airspeed, outside air temperature, vertical acceleration, engine RPM, manifold pressure, and other pertinent variables for a given flight.

(See ICAO term FLIGHT RECORDER.)

FLIGHT RECORDER [ICAO]– Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Note: See Annex 6 Part I, for specifications relating to flight recorders.

FLIGHT SERVICE STATION (FSS)– An air traffic facility which provides pilot briefings, flight plan processing, en route flight advisories, search and rescue services, and assistance to lost aircraft and aircraft in emergency situations. FSS also relay ATC clearances, process Notices to Air Missions, and broadcast aviation weather and aeronautical information. In Alaska, FSS provide Airport Advisory Services.

(See FLIGHT PLAN AREA.)
(See TIE-IN FACILITY.)

FLIGHT STANDARDS DISTRICT OFFICE– An FAA field office serving an assigned geographical area and staffed with Flight Standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft. Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation, enforcement, etc.

FLIGHT TERMINATION– The intentional and deliberate process of terminating the flight of a UA in the event of an unrecoverable lost link, loss of control, or other failure that compromises the safety of flight.

FLIGHT TEST– A flight for the purpose of:

a. Investigating the operation/flight characteristics of an aircraft or aircraft component.

b. Evaluating an applicant for a pilot certificate or rating.

FLIGHT VISIBILITY–

(See VISIBILITY.)

FLIP–

(See DOD FLIP.)

FLY-BY WAYPOINT– A fly-by waypoint requires the use of turn anticipation to avoid overshoot of the next flight segment.

FLY HEADING (DEGREES)– Informs the pilot of the heading he/she should fly. The pilot may have to turn to, or continue on, a specific compass direction in order to comply with the instructions. The pilot is expected to turn in the shorter direction to the heading unless otherwise instructed by ATC.

FLY-OVER WAYPOINT– A fly-over waypoint precludes any turn until the waypoint is overflown and is followed by an intercept maneuver of the next flight segment.

FLY VISUAL TO AIRPORT–

(See PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT.)

FLYAWAY– When the pilot is unable to effect control of the aircraft and, as a result, the UA is not operating in a predictable or planned manner.

FMA–

(See FINAL MONITOR AID.)

FMS–

(See FLIGHT MANAGEMENT SYSTEM.)

FORMATION FLIGHT– More than one aircraft which, by prior arrangement between the pilots, operate as a single aircraft with regard to navigation 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 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 of 10 NM or more from the aircraft's cleared route.

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–BASED INTERVAL MANAGEMENT–SPACING (GIM–S), SPEED ADVISORY– A calculated speed that will allow aircraft to meet the TBFM schedule at en route and TRACON boundary meter fixes.

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 radio to a telephone connection. If the connection goes to ATC, the pilot can obtain an IFR clearance or close an IFR flight plan. If the connection goes to Flight Service, the pilot can open or close a VFR flight plan; obtain an updated weather briefing prior to takeoff; close an IFR flight plan; or, for Alaska or MEDEVAC only, obtain an IFR clearance. 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.)

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 noticeable. The rate of accumulation is slightly greater than the rate of sublimation. A representative accretion rate for reference purposes is less than ¼ inch (6 mm) per hour on the outer wing. The pilot should consider exiting the icing conditions before they become worse.

b. Light– The rate of ice accumulation requires occasional cycling of manual deicing systems to minimize ice accretions on the airframe. A representative accretion rate for reference purposes is ¼ inch to 1 inch (0.6 to 2.5 cm) per hour on the unprotected part of the outer wing. The pilot should consider exiting the icing condition.

c. Moderate– The rate of ice accumulation requires frequent cycling of manual deicing systems to minimize ice accretions on the airframe. A representative accretion rate for reference purposes is 1 to 3 inches (2.5 to 7.5 cm) per hour on the unprotected part of the outer wing. The pilot should consider exiting the icing condition as soon as possible.

d. Severe– The rate of ice accumulation is such that ice protection systems fail to remove the accumulation of ice and ice accumulates in locations not normally prone to icing, such as areas aft of protected surfaces and any other areas identified by the manufacturer. A representative accretion rate for reference purposes is more than 3 inches (7.5 cm) per hour on the unprotected part of the outer wing. By regulation, immediate exit is required.

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.

IDAC–
(See INTEGRATED DEPARTURE/ARRIVAL CAPABILITY.)

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 5 NM separation. 3 NM separation, 1 ½ NM 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.

INTEGRATED DEPARTURE/ARRIVAL CAPABILITY (IDAC)– A Tower/TRACON departure scheduling capability within TBFM that allows departures to be scheduled into either an arrival flow or an en route flow. IDAC provides a mechanism for electronic coordination of departure release times.

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.

INTERNATIONAL NOTICE– A notice containing flight prohibitions, potential hostile situations, or other international/foreign oceanic airspace matters. These notices can be found on the International Notices website.

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.)

M

MAA–
(See MAXIMUM AUTHORIZED ALTITUDE.)

MACH NUMBER– The ratio of true airspeed to the speed of sound; e.g., MACH .82, MACH 1.6.
(See AIRSPEED.)

MACH TECHNIQUE [ICAO]– Describes a control technique used by air traffic control whereby turbojet aircraft operating successively along suitable routes are cleared to maintain appropriate MACH numbers for a relevant portion of the en route phase of flight. The principle objective is to achieve improved utilization of the airspace and to ensure that separation between successive aircraft does not decrease below the established minima.

MAHWP– Missed Approach Holding Waypoint

MAINTAIN–

a. Concerning altitude/flight level, the term means to remain at the altitude/flight level specified. The phrase "climb and" or "descend and" normally precedes "maintain" and the altitude assignment; e.g., "descend and maintain 5,000."

b. Concerning other ATC instructions, the term is used in its literal sense; e.g., maintain VFR.

MAINTENANCE PLANNING FRICTION LEVEL– The friction level specified in AC 150/5320-12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces, which represents the friction value below which the runway pavement surface remains acceptable for any category or class of aircraft operations but which is beginning to show signs of deterioration. This value will vary depending on the particular friction measurement equipment used.

MAKE SHORT APPROACH– Used by ATC to inform a pilot to alter his/her traffic pattern so as to make a short final approach.
(See TRAFFIC PATTERN.)

MAN PORTABLE AIR DEFENSE SYSTEMS (MANPADS)– MANPADS are lightweight, shoulder–launched, missile systems used to bring down aircraft and create mass casualties. The potential for MANPADS use against airborne aircraft is real and requires familiarity with the subject. Terrorists choose MANPADS because the weapons are low cost, highly mobile, require minimal set–up time, and are easy to use and maintain. Although the weapons have limited range, and their accuracy is affected by poor visibility and adverse weather, they can be fired from anywhere on land or from boats where there is unrestricted visibility to the target.

MANDATORY ALTITUDE– An altitude depicted on an instrument Approach Procedure Chart requiring the aircraft to maintain altitude at the depicted value.

MANPADS–
(See MAN PORTABLE AIR DEFENSE SYSTEMS.)

MAP–
(See MISSED APPROACH POINT.)

MARKER BEACON– An electronic navigation facility transmitting a 75 MHz vertical fan or boneshaped radiation pattern. Marker beacons are identified by their modulation frequency and keying code, and when received by compatible airborne equipment, indicate to the pilot, both aurally and visually, that he/she is passing over the facility.
(See INNER MARKER.)
(See MIDDLE MARKER.)
(See OUTER MARKER.)
(Refer to AIM.)

MARSA–
(See MILITARY AUTHORITY ASSUMES RESPONSIBILITY FOR SEPARATION OF AIRCRAFT.)

MAWP– Missed Approach Waypoint

MAXIMUM AUTHORIZED ALTITUDE– A published altitude representing the maximum usable altitude or flight level for an airspace structure or route segment. It is the highest altitude on a Federal airway, jet route, area navigation low or high route, or other direct route for which an MEA is designated in 14 CFR Part 95 at which adequate reception of navigation aid signals is assured.

MAYDAY– The international radiotelephony distress signal. When repeated three times, it indicates

imminent and grave danger and that immediate assistance is requested.
(See PAN-PAN.)
(Refer to AIM.)

MCA–
(See MINIMUM CROSSING ALTITUDE.)

MDA–
(See MINIMUM DESCENT ALTITUDE.)

MEA–
(See MINIMUM EN ROUTE IFR ALTITUDE.)

MEARTS–
(See MICRO-EN ROUTE AUTOMATED RADAR TRACKING SYSTEM.)

METEOROLOGICAL IMPACT STATEMENT– An unscheduled planning forecast describing conditions expected to begin within 4 to 12 hours which may impact the flow of air traffic in a specific center's (ARTCC) area.

METER FIX ARC– A semicircle, equidistant from a meter fix, usually in low altitude relatively close to the meter fix, used to help TBFM/ERAM calculate a meter time, and determine appropriate sector meter list assignments for aircraft not on an established arrival route or assigned a meter fix.

METER REFERENCE ELEMENT (MRE)– A constraint point through which traffic flows are managed. An MRE can be the runway threshold, a meter fix, or a meter arc.

METER REFERENCE POINT LIST (MRP)– A list of TBFM delay information conveyed to the controller on the situation display via the Meter Reference Point View, commonly known as the "Meter List."

METERING–A method of time–regulating traffic flows in the en route and terminal environments.

METERING AIRPORTS– Airports adapted for metering and for which optimum flight paths are defined. A maximum of 15 airports may be adapted.

METERING FIX– A fix along an established route from over which aircraft will be metered prior to entering terminal airspace. Normally, this fix should be established at a distance from the airport which will facilitate a profile descent 10,000 feet above airport elevation (AAE) or above.

MHA–
(See MINIMUM HOLDING ALTITUDE.)

MIA–
(See MINIMUM IFR ALTITUDES.)

MICROBURST– A small downburst with outbursts of damaging winds extending 2.5 miles or less. In spite of its small horizontal scale, an intense microburst could induce wind speeds as high as 150 knots
(Refer to AIM.)

MICRO-EN ROUTE AUTOMATED RADAR TRACKING SYSTEM (MEARTS)– An automated radar and radar beacon tracking system capable of employing both short-range (ASR) and long-range (ARSR) radars. This microcomputer driven system provides improved tracking, continuous data recording, and use of full digital radar displays.

MID RVR–
(See VISIBILITY.)

MIDDLE COMPASS LOCATOR–
(See COMPASS LOCATOR.)

MIDDLE MARKER– A marker beacon that defines a point along the glideslope of an ILS normally located at or near the point of decision height (ILS Category I). It is keyed to transmit alternate dots and dashes, with the alternate dots and dashes keyed at the rate of 95 dot/dash combinations per minute on a 1300 Hz tone, which is received aurally and visually by compatible airborne equipment.
(See INSTRUMENT LANDING SYSTEM.)
(See MARKER BEACON.)
(Refer to AIM.)

MILES-IN-TRAIL– A specified distance between aircraft, normally, in the same stratum associated with the same destination or route of flight.

MILITARY AUTHORITY ASSUMES RESPONSIBILITY FOR SEPARATION OF AIRCRAFT (MARSA)– A condition whereby the military services involved assume responsibility for separation between participating military aircraft in the ATC system. It is used only for required IFR operations which are specified in letters of agreement or other appropriate FAA or military documents.

MILITARY LANDING ZONE– A landing strip used exclusively by the military for training. A military landing zone does not carry a runway designation.

MILITARY OPERATIONS AREA–
(See SPECIAL USE AIRSPACE.)

MILITARY TRAINING ROUTES– Airspace of defined vertical and lateral dimensions established for the conduct of military flight training at airspeeds in excess of 250 knots IAS.
(See IFR MILITARY TRAINING ROUTES.)
(See VFR MILITARY TRAINING ROUTES.)

MINIMA–
(See MINIMUMS.)

MINIMUM CROSSING ALTITUDE (MCA)– The lowest altitude at certain fixes at which an aircraft must cross when proceeding in the direction of a higher minimum en route IFR altitude (MEA).
(See MINIMUM EN ROUTE IFR ALTITUDE.)

MINIMUM DESCENT ALTITUDE (MDA)– The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glideslope is provided.
(See NONPRECISION APPROACH PROCEDURE.)

MINIMUM EN ROUTE IFR ALTITUDE (MEA)– The lowest published altitude between radio fixes which assures acceptable navigational signal coverage and meets obstacle clearance requirements between those fixes. The MEA prescribed for a Federal airway or segment thereof, area navigation low or high route, or other direct route applies to the entire width of the airway, segment, or route between the radio fixes defining the airway, segment, or route.
(Refer to 14 CFR Part 91.)
(Refer to 14 CFR Part 95.)
(Refer to AIM.)

MINIMUM FRICTION LEVEL– The friction level specified in AC 150/5320-12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces, that represents the minimum recommended wet pavement surface friction value for any turbojet aircraft engaged in LAHSO. This value will vary with the particular friction measurement equipment used.

MINIMUM FUEL– Indicates that an aircraft's fuel supply has reached a state where, upon reaching the destination, it can accept little or no delay. This is not an emergency situation but merely indicates an emergency situation is possible should any undue delay occur.
(Refer to AIM.)

MINIMUM HOLDING ALTITUDE– The lowest altitude prescribed for a holding pattern which assures navigational signal coverage, communications, and meets obstacle clearance requirements.

MINIMUM IFR ALTITUDES (MIA)– Minimum altitudes for IFR operations as prescribed in 14 CFR Part 91. These altitudes are published on aeronautical charts and prescribed in 14 CFR Part 95 for airways and routes, and in 14 CFR Part 97 for standard instrument approach procedures. If no applicable minimum altitude is prescribed in 14 CFR Part 95 or 14 CFR Part 97, the following minimum IFR altitude applies:

a. In designated mountainous areas, 2,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

b. Other than mountainous areas, 1,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

c. As otherwise authorized by the Administrator or assigned by ATC.
(See MINIMUM CROSSING ALTITUDE.)
(See MINIMUM EN ROUTE IFR ALTITUDE.)
(See MINIMUM OBSTRUCTION CLEARANCE ALTITUDE.)
(See MINIMUM SAFE ALTITUDE.)
(See MINIMUM VECTORING ALTITUDE.)
(Refer to 14 CFR Part 91.)

MINIMUM OBSTRUCTION CLEARANCE ALTITUDE (MOCA)– The lowest published altitude in effect between radio fixes on VOR airways, off-airway routes, or route segments which meets obstacle clearance requirements for the entire route segment and which assures acceptable navigational signal coverage only within 25 statute (22 nautical) miles of a VOR.
(Refer to 14 CFR Part 91.)
(Refer to 14 CFR Part 95.)

MINIMUM RECEPTION ALTITUDE (MRA)– The lowest altitude at which an intersection can be determined.
(Refer to 14 CFR Part 95.)

MINIMUM SAFE ALTITUDE (MSA)–

a. The minimum altitude specified in 14 CFR Part 91 for various aircraft operations.

b. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance for emergency use. These altitudes will be identified as Minimum Safe Altitudes or Emergency Safe Altitudes and are established as follows:

1. Minimum Safe Altitude (MSA). Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance within a 25-mile radius of the navigation facility, waypoint, or airport reference point upon which the MSA is predicated. MSAs are for emergency use only and do not necessarily assure acceptable navigational signal coverage.

(See ICAO term Minimum Sector Altitude.)

2. Emergency Safe Altitude (ESA). Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance in nonmountainous areas and 2,000 feet of obstacle clearance in designated mountainous areas within a 100-mile radius of the navigation facility or waypoint used as the ESA center. These altitudes are normally used only in military procedures and are identified on published procedures as "Emergency Safe Altitudes."

MINIMUM SAFE ALTITUDE WARNING (MSAW)– A function of the EAS and STARS computer that aids the controller by alerting him/her when a tracked Mode C equipped aircraft is below or is predicted by the computer to go below a predetermined minimum safe altitude.

(Refer to AIM.)

MINIMUM SECTOR ALTITUDE [ICAO]– The lowest altitude which may be used under emergency conditions which will provide a minimum clearance of 300 m (1,000 feet) above all obstacles located in an area contained within a sector of a circle of 46 km (25 NM) radius centered on a radio aid to navigation.

MINIMUMS– Weather condition requirements established for a particular operation or type of operation; e.g., IFR takeoff or landing, alternate airport for IFR flight plans, VFR flight, etc.

(See IFR CONDITIONS.)
(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)
(See LANDING MINIMUMS.)
(See VFR CONDITIONS.)
(Refer to 14 CFR Part 91.)
(Refer to AIM.)

MINIMUM VECTORING ALTITUDE (MVA)– The lowest MSL altitude at which an IFR aircraft will be vectored by a radar controller, except as otherwise authorized for radar approaches, departures, and missed approaches. The altitude meets IFR obstacle clearance criteria. It may be lower than the published MEA along an airway or J-route segment. It may be utilized for radar vectoring only upon the controller's determination that an adequate radar return is being received from the aircraft being controlled. Charts depicting minimum vectoring altitudes are normally available only to the controllers and not to pilots.

(Refer to AIM.)

MINUTES-IN-TRAIL– A specified interval between aircraft expressed in time. This method would more likely be utilized regardless of altitude.

MIS–

(See METEOROLOGICAL IMPACT STATEMENT.)

MISSED APPROACH–

a. A maneuver conducted by a pilot when an instrument approach cannot be completed to a landing. The route of flight and altitude are shown on instrument approach procedure charts. A pilot executing a missed approach prior to the Missed Approach Point (MAP) must continue along the final approach to the MAP.

b. A term used by the pilot to inform ATC that he/she is executing the missed approach.

c. At locations where ATC radar service is provided, the pilot should conform to radar vectors when provided by ATC in lieu of the published missed approach procedure.

(See MISSED APPROACH POINT.)
(Refer to AIM.)

MISSED APPROACH POINT (MAP)– A point prescribed in each instrument approach procedure at which a missed approach procedure shall be executed if the required visual reference does not exist.

(See MISSED APPROACH.)
(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

MISSED APPROACH PROCEDURE [ICAO]– The procedure to be followed if the approach cannot be continued.

MISSED APPROACH SEGMENT–
(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

MM–
(See MIDDLE MARKER.)

MOA–
(See MILITARY OPERATIONS AREA.)

MOCA–
(See MINIMUM OBSTRUCTION CLEARANCE ALTITUDE.)

MODE– The letter or number assigned to a specific pulse spacing of radio signals transmitted or received by ground interrogator or airborne transponder components of the Air Traffic Control Radar Beacon System (ATCRBS). Mode A (military Mode 3) and Mode C (altitude reporting) are used in air traffic control.
(See INTERROGATOR.)
(See RADAR.)
(See TRANSPONDER.)
(See ICAO term MODE.)
(Refer to AIM.)

MODE (SSR MODE) [ICAO]– The letter or number assigned to a specific pulse spacing of the interrogation signals transmitted by an interrogator. There are 4 modes, A, B, C and D specified in Annex 10, corresponding to four different interrogation pulse spacings.

MODE C INTRUDER ALERT– A function of certain air traffic control automated systems designed to alert radar controllers to existing or pending situations between a tracked target (known IFR or VFR aircraft) and an untracked target (unknown IFR or VFR aircraft) that requires immediate attention/action.
(See CONFLICT ALERT.)

MODEL AIRCRAFT– An unmanned aircraft that is: (1) capable of sustained flight in the atmosphere; (2) flown within visual line of sight of the person operating the aircraft; and (3) flown for hobby or recreational purposes.

MONITOR– (When used with communication transfer) listen on a specific frequency and stand by for instructions. Under normal circumstances do not establish communications.

MONITOR ALERT (MA)– A function of the TFMS that provides traffic management personnel with a tool for predicting potential capacity problems in individual operational sectors. The MA is an indication that traffic management personnel need to analyze a particular sector for actual activity and to determine the required action(s), if any, needed to control the demand.

MONITOR ALERT PARAMETER (MAP)– The number designated for use in monitor alert processing by the TFMS. The MAP is designated for each operational sector for increments of 15 minutes.

MOSAIC/MULTI–SENSOR MODE– Accepts positional data from multiple radar or ADS–B sites. Targets are displayed from a single source within a radar sort box according to the hierarchy of the sources assigned.

MOUNTAIN WAVE– Mountain waves occur when air is being blown over a mountain range or even the ridge of a sharp bluff area. As the air hits the upwind side of the range, it starts to climb, thus creating what is generally a smooth updraft which turns into a turbulent downdraft as the air passes the crest of the ridge. Mountain waves can cause significant fluctuations in airspeed and altitude with or without associated turbulence.
(Refer to AIM.)

MOVEMENT AREA– The runways, taxiways, and other areas of an airport/heliport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports/heliports with a tower, specific approval for entry onto the movement area must be obtained from ATC.
(See ICAO term MOVEMENT AREA.)

MOVEMENT AREA [ICAO]– That part of an aerodrome to be used for the takeoff, landing and taxiing of aircraft, consisting of the maneuvering area and the apron(s).

MOVING TARGET INDICATOR– An electronic device which will permit radar scope presentation only from targets which are in motion. A partial remedy for ground clutter.

MRA–
(See MINIMUM RECEPTION ALTITUDE.)

MRE–
(See METER REFERENCE ELEMENT.)

MRP
(See METER REFERENCE POINT LIST.)

MSA–
(See MINIMUM SAFE ALTITUDE.)

MSAW–
(See MINIMUM SAFE ALTITUDE WARNING.)

MTI–
(See MOVING TARGET INDICATOR.)

MTR–
(See MILITARY TRAINING ROUTES.)

MULTICOM– A mobile service not open to public correspondence used to provide communications essential to conduct the activities being performed by or directed from private aircraft.

MULTIPLE RUNWAYS– The utilization of a dedicated arrival runway(s) for departures and a dedicated departure runway(s) for arrivals when feasible to reduce delays and enhance capacity.

MVA–
(See MINIMUM VECTORING ALTITUDE.)

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 DIGEST (NFDD)– A daily (except weekends and Federal holidays) publication of flight information appropriate to aeronautical charts, aeronautical publications, Notices to Air Missions, 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. 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 alerting, 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.

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 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 AIR MISSIONS.)

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 AIR MISSIONS (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.)

NRR–

(See NON–RESTRICTIVE ROUTING.)

NRS–

(See NAVIGATION REFERENCE SYSTEM.)

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.)

O

OBSTACLE– An existing object, object of natural growth, or terrain at a fixed geographical location or which may be expected at a fixed location within a prescribed area with reference to which vertical clearance is or must be provided during flight operation.

OBSTACLE DEPARTURE PROCEDURE (ODP)– A preplanned instrument flight rule (IFR) departure procedure printed for pilot use in textual or graphic form to provide obstruction clearance via the least onerous route from the terminal area to the appropriate en route structure. ODPs are recommended for obstruction clearance and may be flown without ATC clearance unless an alternate departure procedure (SID or radar vector) has been specifically assigned by ATC.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See STANDARD INSTRUMENT DEPARTURES.)

(Refer to AIM.)

OBSTACLE FREE ZONE– The OFZ is a three–dimensional volume of airspace which protects for the transition of aircraft to and from the runway. The OFZ clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible NAVAID locations that are fixed by function. Additionally, vehicles, equipment, and personnel may be authorized by air traffic control to enter the area using the provisions of FAA Order JO 7110.65, paragraph 3–1–5, Vehicles/Equipment/Personnal Near/On Runways. The runway OFZ and when applicable, the inner-approach OFZ, and the inner-transitional OFZ, comprise the OFZ.

a. Runway OFZ. The runway OFZ is a defined volume of airspace centered above the runway. The runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The runway OFZ extends 200 feet beyond each end of the runway. The width is as follows:

1. For runways serving large airplanes, the greater of:

(a) 400 feet, or

(b) 180 feet, plus the wingspan of the most demanding airplane, plus 20 feet per 1,000 feet of airport elevation.

2. For runways serving only small airplanes:

(a) 300 feet for precision instrument runways.

(b) 250 feet for other runways serving small airplanes with approach speeds of 50 knots, or more.

(c) 120 feet for other runways serving small airplanes with approach speeds of less than 50 knots.

b. Inner-approach OFZ. The inner-approach OFZ is a defined volume of airspace centered on the approach area. The inner-approach OFZ applies only to runways with an approach lighting system. The inner-approach OFZ begins 200 feet from the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the approach lighting system. The width of the inner-approach OFZ is the same as the runway OFZ and rises at a slope of 50 (horizontal) to 1 (vertical) from the beginning.

c. Inner-transitional OFZ. The inner transitional surface OFZ is a defined volume of airspace along the sides of the runway and inner-approach OFZ and applies only to precision instrument runways. The inner-transitional surface OFZ slopes 3 (horizontal) to 1 (vertical) out from the edges of the runway OFZ and inner-approach OFZ to a height of 150 feet above the established airport elevation.

(Refer to AC 150/5300-13, Chapter 3.)

(Refer to FAA Order JO 7110.65, Para 3–1–5, Vehicles/Equipment/Personnel Near/On Runways.)

OBSTRUCTION– Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, Subpart C.

OBSTRUCTION LIGHT– A light or one of a group of lights, usually red or white, frequently mounted on a surface structure or natural terrain to warn pilots of the presence of an obstruction.

OCEANIC AIRSPACE– Airspace over the oceans of the world, considered international airspace, where oceanic separation and procedures per the International Civil Aviation Organization are applied. Responsibility for the provisions of air traffic control

service in this airspace is delegated to various countries, based generally upon geographic proximity and the availability of the required resources.

OCEANIC ERROR REPORT– A report filed when ATC observes an Oceanic Error as defined by FAA Order 7110.82, Reporting Oceanic Errors.

OCEANIC PUBLISHED ROUTE– A route established in international airspace and charted or described in flight information publications, such as Route Charts, DOD En route Charts, Chart Supplements, NOTAMs, and Track Messages.

OCEANIC TRANSITION ROUTE– An ATS route established for the purpose of transitioning aircraft to/from an organized track system.

ODP–
(See OBSTACLE DEPARTURE PROCEDURE.)

OFF COURSE– A term used to describe a situation where an aircraft has reported a position fix or is observed on radar at a point not on the ATC-approved route of flight.

OFF–ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)– A published altitude which provides terrain and obstruction clearance with a 1,000 foot buffer in non–mountainous areas and a 2,000 foot buffer in designated mountainous areas within the United States, and a 3,000 foot buffer outside the US ADIZ. These altitudes are not assessed for NAVAID signal coverage, air traffic control surveillance, or communications coverage, and are published for general situational awareness, flight planning, and in–flight contingency use.

OFF-ROUTE VECTOR– A vector by ATC which takes an aircraft off a previously assigned route. Altitudes assigned by ATC during such vectors provide required obstacle clearance.

OFFSET PARALLEL RUNWAYS– Staggered runways having centerlines which are parallel.

OFFSHORE/CONTROL AIRSPACE AREA– That portion of airspace between the U.S. 12 NM limit and the oceanic CTA/FIR boundary within which air traffic control is exercised. These areas are established to provide air traffic control services. Offshore/Control Airspace Areas may be classified as either Class A airspace or Class E airspace.

OFT–
(See OUTER FIX TIME.)

OM–
(See OUTER MARKER.)

ON COURSE–

a. Used to indicate that an aircraft is established on the route centerline.

b. Used by ATC to advise a pilot making a radar approach that his/her aircraft is lined up on the final approach course.

(See ON-COURSE INDICATION.)

ON-COURSE INDICATION– An indication on an instrument, which provides the pilot a visual means of determining that the aircraft is located on the centerline of a given navigational track, or an indication on a radar scope that an aircraft is on a given track.

ONE-MINUTE WEATHER– The most recent one minute updated weather broadcast received by a pilot from an uncontrolled airport ASOS/AWOS.

ONER–
(See OCEANIC NAVIGATIONAL ERROR REPORT.)

OPEN LOOP CLEARANCE– Provides a lateral vector solution that does not include a return to route point.

OPERATIONAL–
(See DUE REGARD.)

OPERATIONS SPECIFICATIONS [ICAO]– The authorizations, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

OPPOSITE DIRECTION AIRCRAFT– Aircraft are operating in opposite directions when:

a. They are following the same track in reciprocal directions; or

b. Their tracks are parallel and the aircraft are flying in reciprocal directions; or

c. Their tracks intersect at an angle of more than 135°.

OPTION APPROACH– An approach requested and conducted by a pilot which will result in either a touch-and-go, missed approach, low approach, stop-and-go, or full stop landing. 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 CLEARED FOR THE OPTION.)
(Refer to AIM.)

ORGANIZED TRACK SYSTEM– A series of ATS routes which are fixed and charted; i.e., CEP, NOPAC, or flexible and described by NOTAM; i.e., NAT TRACK MESSAGE.

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.)

PDRR–
(See PRE–DEPARTURE REROUTE.)

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.

PERTI–
(See PLAN, EXECUTE, REVIEW, TRAIN, IMPROVE.)

PGUI–
(See PLANVIEW GRAPHICAL USER INTERFACE.)

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.

PLAN, EXECUTE, REVIEW, TRAIN, IMPROVE (PERTI)– A process that delivers a one–day detailed plan for NAS operations, and a two–day outlook, which sets NAS performance goals for high impact constraints. PLAN: Increase lead time for identifying aviation system constraint planning and goals while utilizing historical NAS performance data and constraints to derive successful and/or improved advance planning strategies. EXECUTE: Set goals and a strategy. The Air Traffic Control System Command Center (ATCSCC), FAA field facilities, and aviation stakeholders execute the strategy and work to achieve the desired/planned outcomes. REVIEW: Utilize post event analysis and lessons learned to define and implement future strategies and operational triggers based on past performance and outcomes, both positive and negative. TRAIN: Develop training that includes rapid and continuous feedback to operational personnel and provides increased data and weather knowledge and tools for analytical usage and planning. IMPROVE: Implement better information sharing processes, technologies, and procedures that improve the skills and technology needed to implement operational insights and improvements.

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)

PLANVIEW GRAPHICAL USER INTERFACE (PGUI)– A TBFM display that provides a spatial display of individual aircraft track information.

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.

PRE–DEPARTURE REROUTE (PDRR)– A capability within the Traffic Flow Management System that enables ATC to quickly amend and execute revised departure clearances that mitigate en route constraints or balance en route traffic flows.

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.)

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 10 NM from the DER, and that penetrates that airport/heliport’s diverse departure obstacle clearance surface (OCS).

c. An obstacle beyond 10 NM 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

RAD–
(See ROUTE AMENDMENT DIALOG.)

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. Airport 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 PILOT IN COMMAND (RPIC)– The RPIC is directly responsible for and is the final authority as to the operation of the unmanned aircraft system.

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.

REROUTE IMPACT ASSESSMENT (RRIA)– A capability within the Traffic Flow Management System that is used to define and evaluate a potential reroute prior to implementation, with or without miles–in–trail (MIT) restrictions. RRIA functions estimate the impact on demand (e.g., sector loads) and performance (e.g., flight delay). Using RRIA, traffic management personnel can determine whether the reroute will sufficiently reduce demand in the Flow Constraint Area and not create excessive "spill over" demand in the adjacent airspace on a specific route segment or point of interest (POI).

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 AMENDMENT DIALOG (RAD)– A capability within the Traffic Flow Management System that allows traffic management personnel to submit or edit a route amendment for one or more flights.

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.

RPIC–
(See REMOTE PILOT IN COMMAND.)

RRIA–
(See REROUTE IMPACT ASSESSMENT.)

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–
(See SEGMENTS OF A SID/STAR)

RUNWAY TRANSITION WAYPOINT–
(See SEGMENTS OF A SID/STAR.)

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.)

S

SAA–
(See SPECIAL ACTIVITY AIRSPACE.)

SAFETY ALERT– A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller's judgment, places the aircraft in unsafe proximity to terrain, obstructions, or other aircraft. The controller may discontinue the issuance of further alerts if the pilot advises he/she is taking action to correct the situation or has the other aircraft in sight.

a. Terrain/Obstruction Alert– A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller's judgment, places the aircraft in unsafe proximity to terrain/obstructions; e.g., "Low Altitude Alert, check your altitude immediately."

b. Aircraft Conflict Alert– A safety alert issued by ATC to aircraft under their control if ATC is aware of an aircraft that is not under their control at an altitude which, in the controller's judgment, places both aircraft in unsafe proximity to each other. With the alert, ATC will offer the pilot an alternate course of action when feasible; e.g., "Traffic Alert, advise you turn right heading zero niner zero or climb to eight thousand immediately."

Note: The issuance of a safety alert is contingent upon the capability of the controller to have an awareness of an unsafe condition. The course of action provided will be predicated on other traffic under ATC control. Once the alert is issued, it is solely the pilot's prerogative to determine what course of action, if any, he/she will take.

SAFETY LOGIC SYSTEM– A software enhancement to ASDE–3, ASDE–X, and ASSC, that predicts the path of aircraft landing and/or departing, and/or vehicular movements on runways. Visual and aural alarms are activated when the safety logic projects a potential collision. The Airport Movement Area Safety System (AMASS) is a safety logic system enhancement to the ASDE–3. The Safety Logic System for ASDE–X and ASSC is an integral part of the software program.

SAFETY LOGIC SYSTEM ALERTS–

a. ALERT– An actual situation involving two real safety logic tracks (aircraft/aircraft, aircraft/vehicle, or aircraft/other tangible object) that safety logic has predicted will result in an imminent collision, based upon the current set of Safety Logic parameters.

b. FALSE ALERT–

1. Alerts generated by one or more false surface–radar targets that the system has interpreted as real tracks and placed into safety logic.

2. Alerts in which the safety logic software did not perform correctly, based upon the design specifications and the current set of Safety Logic parameters.

3. The alert is generated by surface radar targets caused by moderate or greater precipitation.

c. NUISANCE ALERT– An alert in which one or more of the following is true:

1. The alert is generated by a known situation that is not considered an unsafe operation, such as LAHSO or other approved operations.

2. The alert is generated by inaccurate secondary radar data received by the Safety Logic System.

3. One or more of the aircraft involved in the alert is not intending to use a runway (for example, helicopter, pipeline patrol, non–Mode C overflight, etc.).

d. VALID NON–ALERT– A situation in which the safety logic software correctly determines that an alert is not required, based upon the design specifications and the current set of Safety Logic parameters.

e. INVALID NON–ALERT– A situation in which the safety logic software did not issue an alert when an alert was required, based upon the design specifications.

SAIL BACK– A maneuver during high wind conditions (usually with power off) where float plane movement is controlled by water rudders/opening and closing cabin doors.

SAME DIRECTION AIRCRAFT– Aircraft are operating in the same direction when:

a. They are following the same track in the same direction; or

b. Their tracks are parallel and the aircraft are flying in the same direction; or

c. Their tracks intersect at an angle of less than 45 degrees.

SAR–
(See SEARCH AND RESCUE.)

SATELLITE–BASED AUGMENTATION SYSTEM (SBAS) – A wide coverage augmentation system in which the user receives augmentation information from a satellite–based transmitter.
(See WIDE–AREA AUGMENTATION SYSTEM (WAAS.)

SAW–
(See AVIATION WATCH NOTIFICATION MESSAGE.)

SAY AGAIN– Used to request a repeat of the last transmission. Usually specifies transmission or portion thereof not understood or received; e.g., "Say again all after ABRAM VOR."

SAY ALTITUDE– Used by ATC to ascertain an aircraft's specific altitude/flight level. When the aircraft is climbing or descending, the pilot should state the indicated altitude rounded to the nearest 100 feet.

SAY HEADING– Used by ATC to request an aircraft heading. The pilot should state the actual heading of the aircraft.

SCHEDULED TIME OF ARRIVAL (STA)– A STA is the desired time that an aircraft should cross a certain point (landing or metering fix). It takes other traffic and airspace configuration into account. A STA time shows the results of the TBFM scheduler that has calculated an arrival time according to parameters such as optimized spacing, aircraft performance, and weather.

SDF–
(See SIMPLIFIED DIRECTIONAL FACILITY.)

SEA LANE– A designated portion of water outlined by visual surface markers for and intended to be used by aircraft designed to operate on water.

SEARCH AND RESCUE– A service which seeks missing aircraft and assists those found to be in need of assistance. It is a cooperative effort using the facilities and services of available Federal, state and local agencies. The U.S. Coast Guard is responsible for coordination of search and rescue for the Maritime Region, and the U.S. Air Force is responsible for search and rescue for the Inland Region. Information pertinent to search and rescue should be passed through any air traffic facility or be transmitted directly to the Rescue Coordination Center by telephone.
(See FLIGHT SERVICE STATION.)
(See RESCUE COORDINATION CENTER.)
(Refer to AIM.)

SEARCH AND RESCUE FACILITY– A facility responsible for maintaining and operating a search and rescue (SAR) service to render aid to persons and property in distress. It is any SAR unit, station, NET, or other operational activity which can be usefully employed during an SAR Mission; e.g., a Civil Air Patrol Wing, or a Coast Guard Station.
(See SEARCH AND RESCUE.)

SECNOT–
(See SECURITY NOTICE.)

SECONDARY RADAR TARGET– A target derived from a transponder return presented on a radar display.

SECTIONAL AERONAUTICAL CHARTS–
(See AERONAUTICAL CHART.)

SECTOR LIST DROP INTERVAL– A parameter number of minutes after the meter fix time when arrival aircraft will be deleted from the arrival sector list.

SECURITY NOTICE (SECNOT) – A SECNOT is a request originated by the Air Traffic Security Coordinator (ATSC) for an extensive communications search for aircraft involved, or suspected of being involved, in a security violation, or are considered a security risk. A SECNOT will include the aircraft identification, search area, and expiration time. The search area, as defined by the ATSC, could be a single airport, multiple airports, a radius of an airport or fix, or a route of flight. Once the expiration time has been reached, the SECNOT is considered to be canceled.

SECURITY SERVICES AIRSPACE – Areas established through the regulatory process or by NOTAM, issued by the Administrator under title 14, CFR, sections 99.7, 91.141, and 91.139, which specify that ATC security services are required; i.e., ADIZ or temporary flight rules areas.

SEE AND AVOID– When weather conditions permit, pilots operating IFR or VFR are required to observe and maneuver to avoid other aircraft. Right-of-way rules are contained in 14 CFR Part 91.

SEGMENTED CIRCLE– A system of visual indicators designed to provide traffic pattern

information at airports without operating control towers.

(Refer to AIM.)

SEGMENTS OF A SID/STAR–

a. En Route Transition– The segment(s) of a SID/STAR that connect to/from en route flight. Not all SIDs/STARs will contain an en route transition.

b. En Route Transition Waypoint– The NAVAID/fix/waypoint that defines the beginning of the SID/STAR en route transition.

c. Common Route– The segment(s) of a SID/STAR procedure that provides a single route serving an airport/runway or multiple airports/runways. The common route may consist of a single point. Not all conventional SIDs will contain a common route.

d. Runway Transition– The segment(s) of a SID/STAR between the common route/point and the runway(s). Not all SIDs/STARs will contain a runway transition.

e. Runway Transition Waypoint (RTW)– On a STAR, the NAVAID/fix/waypoint that defines the end of the common route or en route transition and the beginning of a runway transition (In the arrival route description found on the STAR chart, the last fix of the common route and the first fix of the runway transition(s)).

SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE– An instrument approach procedure may have as many as four separate segments depending on how the approach procedure is structured.

a. Initial Approach– The segment between the initial approach fix and the intermediate fix or the point where the aircraft is established on the intermediate course or final approach course.

(See ICAO term INITIAL APPROACH SEGMENT.)

b. Intermediate Approach– The segment between the intermediate fix or point and the final approach fix.

(See ICAO term INTERMEDIATE APPROACH SEGMENT.)

c. Final Approach– The segment between the final approach fix or point and the runway, airport, or missed approach point.

(See ICAO term FINAL APPROACH SEGMENT.)

d. Missed Approach– The segment between the missed approach point or the point of arrival at decision height and the missed approach fix at the prescribed altitude.

(Refer to 14 CFR Part 97.)

(See ICAO term MISSED APPROACH PROCEDURE.)

SELF–BRIEFING– A self–briefing is a review, using automated tools, of all meteorological and aeronautical information that may influence the pilot in planning, altering, or canceling a proposed route of flight.

SEPARATION– In air traffic control, the spacing of aircraft to achieve their safe and orderly movement in flight and while landing and taking off.

(See SEPARATION MINIMA.)

(See ICAO term SEPARATION.)

SEPARATION [ICAO]– Spacing between aircraft, levels or tracks.

SEPARATION MINIMA– The minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures.

(See SEPARATION.)

SERVICE– A generic term that designates functions or assistance available from or rendered by air traffic control. For example, Class C service would denote the ATC services provided within a Class C airspace area.

SEVERE WEATHER AVOIDANCE PLAN (SWAP)– An approved plan to minimize the affect of severe weather on traffic flows in impacted terminal and/or ARTCC areas. A SWAP is normally implemented to provide the least disruption to the ATC system when flight through portions of airspace is difficult or impossible due to severe weather.

SEVERE WEATHER FORECAST ALERTS– Preliminary messages issued in order to alert users that a Severe Weather Watch Bulletin (WW) is being issued. These messages define areas of possible severe thunderstorms or tornado activity. The messages are unscheduled and issued as required by the Storm Prediction Center (SPC) at Norman, Oklahoma.

(See AIRMET.)

(See CONVECTIVE SIGMET.)

(See CWA.)

(See SIGMET.)

SFA–
(See SINGLE FREQUENCY APPROACH.)

SFO–
(See SIMULATED FLAMEOUT.)

SHF–
(See SUPER HIGH FREQUENCY.)

SHORT RANGE CLEARANCE– A clearance issued to a departing IFR flight which authorizes IFR flight to a specific fix short of the destination while air traffic control facilities are coordinating and obtaining the complete clearance.

SHORT TAKEOFF AND LANDING AIRCRAFT (STOL)– An aircraft which, at some weight within its approved operating weight, is capable of operating from a runway in compliance with the applicable STOL characteristics, airworthiness, operations, noise, and pollution standards.
(See VERTICAL TAKEOFF AND LANDING AIRCRAFT.)

SIAP–
(See STANDARD INSTRUMENT APPROACH PROCEDURE.)

SID–
(See STANDARD INSTRUMENT DEPARTURE.)

SIDESTEP MANEUVER– A visual maneuver accomplished by a pilot at the completion of an instrument approach to permit a straight-in landing on a parallel runway not more than 1,200 feet to either side of the runway to which the instrument approach was conducted.
(Refer to AIM.)

SIGMET– A weather advisory issued concerning weather significant to the safety of all aircraft. SIGMET advisories cover severe and extreme turbulence, severe icing, and widespread dust or sandstorms that reduce visibility to less than 3 miles.
(See AIRMET.)
(See CONVECTIVE SIGMET.)
(See CWA.)
(See ICAO term SIGMET INFORMATION.)
(See SAW.)
(Refer to AIM.)

SIGMET INFORMATION [ICAO]– Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of aircraft operations.

SIGNIFICANT METEOROLOGICAL INFORMATION–
(See SIGMET.)

SIGNIFICANT POINT– A point, whether a named intersection, a NAVAID, a fix derived from a NAVAID(s), or geographical coordinate expressed in degrees of latitude and longitude, which is established for the purpose of providing separation, as a reporting point, or to delineate a route of flight.

SIMPLIFIED DIRECTIONAL FACILITY (SDF)– A NAVAID used for nonprecision instrument approaches. The final approach course is similar to that of an ILS localizer except that the SDF course may be offset from the runway, generally not more than 3 degrees, and the course may be wider than the localizer, resulting in a lower degree of accuracy.
(Refer to AIM.)

SIMULATED FLAMEOUT– A practice approach by a jet aircraft (normally military) at idle thrust to a runway. The approach may start at a runway (high key) and may continue on a relatively high and wide downwind leg with a continuous turn to final. It terminates in landing or low approach. The purpose of this approach is to simulate a flameout.
(See FLAMEOUT.)

SIMULTANEOUS CLOSE PARALLEL APPROACHES– A simultaneous, independent approach operation permitting ILS/RNAV/GLS approaches to airports having parallel runways separated by at least 3,000 feet and less than 4,300–feet between centerlines. Aircraft are permitted to pass each other during these simultaneous operations. Integral parts of a total system are radar, NTZ monitoring with enhanced FMA color displays that include aural and visual alerts and predictive aircraft position software, communications override, ATC procedures, an Attention All Users Page (AAUP), PRM in the approach name, and appropriate ground based and airborne equipment. High update rate surveillance sensor required for certain runway or approach course separations.

SIMULTANEOUS (CONVERGING) DEPENDENT APPROACHES- An approach operation permitting ILS/RNAV/GLS approaches to runways or missed approach courses that intersect where required minimum spacing between the aircraft on each final approach course is required.

SIMULTANEOUS (CONVERGING) INDEPENDENT APPROACHES- An approach operation permitting ILS/RNAV/GLS approaches to non-parallel runways where approach procedure design maintains the required aircraft spacing throughout the approach and missed approach and hence the operations may be conducted independently.

SIMULTANEOUS ILS APPROACHES– An approach system permitting simultaneous ILS approaches to airports having parallel runways separated by at least 4,300 feet between centerlines. Integral parts of a total system are ILS, radar, communications, ATC procedures, and appropriate airborne equipment.

(See PARALLEL RUNWAYS.)

(Refer to AIM.)

SIMULTANEOUS OFFSET INSTRUMENT APPROACH (SOIA)– An instrument landing system comprised of an ILS PRM, RNAV PRM or GLS PRM approach to one runway and an offset LDA PRM with glideslope or an RNAV PRM or GLS PRM approach utilizing vertical guidance to another where parallel runway spaced less than 3,000 feet and at least 750 feet apart. The approach courses converge by 2.5 to 3 degrees. Simultaneous close parallel PRM approach procedures apply up to the point where the approach course separation becomes 3,000 feet, at the offset MAP. From the offset MAP 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.)

SLOW TAXI– To taxi a float plane at low power or low RPM.

SMALL UNMANNED AIRCRAFT SYSTEM (sUAS)– An unmanned aircraft weighing less than 55 pounds on takeoff, including everything that is on board or otherwise attached to the aircraft.

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.)

SPACE LAUNCH AND REENTRY AREA– Locations where commercial space launch and/or

reentry operations occur. For pilot awareness, a rocket–shaped symbol is used to depict space launch and reentry areas on sectional aeronautical charts.

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 meteorological 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.

SPEED ADVISORY– Speed advisories that are generated within Time–Based Flow Management to assist controllers to meet the Scheduled Time of Arrival (STA) at the meter fix/meter arc. See also Ground–Based Interval Management–Spacing (GIM–S) Speed Advisory.

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 ALTITUDE RESERVATION (STATIONARY ALTRV)– An altitude reservation which encompasses activities in a fixed area. Stationary ALTRVs 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.

STNR ALT RESERVATION– An abbreviation for Stationary Altitude Reservation commonly used in NOTAMs.
(See STATIONARY ALTITUDE RESERVATION.)

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.

sUAS–

(See SMALL UNMANNED AIRCRAFT SYSTEM.)

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.

SURFACE METERING PROGRAM– A capability within Terminal Flight Data Manager that provides the user with the ability to tactically manage surface traffic flows through adjusting desired minimum and maximum departure queue lengths to balance surface demand with capacity. When a demand/capacity imbalance for a surface resource is predicted, a metering procedure is recommended.

SURFACE VIEWER– A capability within the Traffic Flow Management System that provides situational awareness for a user–selected airport. The Surface Viewer displays a top–down view of an airport depicting runways, taxiways, gate areas, ramps, and buildings. The display also includes icons representing aircraft and vehicles currently on the surface, with identifying information. In addition, the display includes current airport configuration information such as departure/arrival runways and airport departure/arrival rates.

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.)

SUSPICIOUS UAS– Suspicious UAS operations may include operating without authorization,

loitering in the vicinity of sensitive locations, (e.g., national security, law enforcement facilities, and critical infrastructure), or disrupting normal air traffic operations resulting in runway changes, ground stops, pilot evasive action, etc. The report of a UAS operation alone does not constitute suspicious activity. Development of a comprehensive list of suspicious activities is not possible due to the vast number of situations that could be considered suspicious. ATC must exercise sound judgment when identifying situations that could constitute or indicate a suspicious activity.

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.

TBM–
(See TIME–BASED MANAGEMENT.)

TBO–
(See TRAJECTORY–BASED OPERATIONS.)

TCAS–
(See TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM.)

TCH–
(See THRESHOLD CROSSING HEIGHT.)

TDLS–
(See TERMINAL DATA LINK SYSTEM.)

TDZE–
(See TOUCHDOWN ZONE ELEVATION.)

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.

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 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 FLIGHT DATA MANAGER (TFDM)– An integrated tower flight data automation system to provide improved airport surface and terminal airspace management. TFDM enhances traffic flow management data integration with Time–Based Flow Management (TBFM) and Traffic

Flow Management System (TFMS) to enable airlines, controllers, and airports to share and exchange real–time data. This improves surface traffic management and enhances capabilities of TFMS and TBFM. TFDM assists the Tower personnel with surface Traffic Flow Management (TFM) and Collaborative Decision Making (CDM) and enables a fundamental change in the Towers from a local airport–specific operation to a NAS–connected metering operation. The single platform consolidates multiple Tower automation systems, including: Departure Spacing Program (DSP), Airport Resource Management Tool (ARMT), Electronic Flight Strip Transfer System (EFSTS), and Surface Movement Advisor (SMA). TFDM data, integrated with other FAA systems such as TBFM and TFMS, allows airlines, controllers, and airports to manage the flow of aircraft more efficiently through all phases of flight from departure to arrival gate.

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 SEQUENCING AND SPACING (TSAS)– Extends scheduling and metering capabilities into the terminal area and provides metering automation tools to terminal controllers and terminal traffic management personnel. Those controllers and traffic management personnel become active participants in time–based metering operations as they work to deliver aircraft accurately to Constraint Satisfaction Points within terminal airspace to include the runway in accordance with scheduled times at those points. Terminal controllers are better able to utilize efficient flight paths, such as Standard Instrument Approach Procedures (SIAPs) that require a Navigational Specification (NavSpec) of RNP APCH with Radius–to–Fix (RF) legs, or Advanced RNP (A–RNP), through tools that support the merging of mixed–equipage traffic flows. For example, merging aircraft flying RNP APCH AR with RF, A–RNP, and non–RNP approach procedures. Additional fields in the flight plan will identify those flights capable of flying the RNP APCH with RF or A–RNP procedures, and those flights will be scheduled for those types of procedures when available. TSAS will schedule these and the non–RNP aircraft to a common merge point. Terminal traffic management personnel have improved situation awareness using displays that allow for the monitoring of terminal metering operations, similar to the displays used today by center traffic management personnel to monitor en route metering operations.

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.)

TFDM–

(See TERMINAL FLIGHT DATA MANAGER.)

TGUI–

(See TIMELINE GRAPHICAL USER INTERFACE.)

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.)

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)– A foundational Decision Support Tool for time–based management in the en route and terminal environments. TBFM's core function is the ability to schedule aircraft within a stream of traffic to reach a defined constraint point (e.g., meter fix/meter arc) at specified times, creating a time–ordered sequence of traffic. The scheduled times allow for merging of traffic flows, efficiently utilizing airport and airspace capacity while minimizing coordination and reducing the need for vectoring/holding. The TBFM schedule is calculated using current aircraft estimated time of arrival at key defined constraint points based on wind forecasts, aircraft flight plan, the desired separation at the constraint point and other parameters. The schedule applies spacing only when needed to maintain the desired separation at one or more constraint points. This includes, but is not limited to, Single Center Metering (SCM), Adjacent Center Metering (ACM), En Route Departure Capability (EDC), Integrated Departure/Arrival Capability (IDAC), Ground–based Interval Management–Spacing (GIM–S), Departure Scheduling, and Extended/Coupled Metering.

TIME–BASED MANAGEMENT (TBM)– A methodology for managing the flow of air traffic

through the assignment of time at specific points for an aircraft. TBM applies time to manage and condition air traffic flows to mitigate demand/capacity imbalances and enhance efficiency and predictability of the NAS. Where implemented, TBM tools will be used to manage traffic even during periods when demand does not exceed capacity. This will sustain operational predictability and assure the regional/national strategic plan is maintained. TBM uses capabilities within TFMS, TBFM, and TFDM. These programs are designed to achieve a specified interval between aircraft. Different types of programs accommodate different phases of flight.

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.

TIMELINE GRAPHICAL USER INTERFACE (TGUI)– A TBFM display that uses timelines to display the Estimated Time of Arrival and Scheduled Time of Arrival of each aircraft to specified constraint points. The TGUI can also display pre–departure and scheduled aircraft.

TIS–B–
(See TRAFFIC INFORMATION SERVICE–BROADCAST.)

TMI–
(See TRAFFIC MANAGEMENT INITIATIVE.)

TMPA–
(See TRAFFIC MANAGEMENT PROGRAM ALERT.)

TMU–
(See TRAFFIC MANAGEMENT UNIT.)

TOD–
(See TOP OF DESCENT.)

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.

TOP OF DESCENT (TOD)– The point at which an aircraft begins the initial descent.

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 INITIATIVE (TMI)– Tools used to manage demand with capacity in the National Airspace System (NAS.) TMIs can be used to manage NAS resources (e.g., airports, sectors, airspace) or to increase the efficiency of the operation. TMIs can be either tactical (i.e., short term) or strategic (i.e., long term), depending on the type of TMI and the operational need.

TRAFFIC MANAGEMENT PROGRAM ALERT– A term used in a Notice to Air Missions (NOTAM) issued in conjunction with a special traffic management program to alert pilots to the existence of the program and to refer them to 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–BASED OPERATIONS (TBO)– An Air Traffic Management method for strategically planning and managing flights throughout the operation by using Time–Based Management (TBM), information exchange between air and ground systems, and the aircraft's ability to fly trajectories in time and space. Aircraft trajectory is defined in four dimensions – latitude, longitude, altitude, and time.

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.

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– 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.

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.

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.)

TSAS–

(See TERMINAL SEQUENCING AND SPACING.)

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.)

TWO-WAY RADIO COMMUNICATIONS FAILURE–

(See LOST COMMUNICATIONS.)

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.)

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 OBSERVER (VO)– A person who is designated by the remote pilot in command to assist the remote pilot in command and the person operating the flight controls of the small UAS (sUAS) to see and avoid other air traffic or objects aloft or on the ground.

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 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.)

VTOL AIRCRAFT–
(See VERTICAL TAKEOFF AND LANDING AIRCRAFT.)

W

WA–
(See AIRMET.)
(See WEATHER ADVISORY.)

WAAS–
(See WIDE-AREA AUGMENTATION SYSTEM.)

WAKE RE–CATEGORIZATION (RECAT)– A set of optimized wake separation standards, featuring an increased number of aircraft wake categories, in use at select airports, which allows reduced wake intervals.
(See WAKE TURBULENCE.)

WAKE TURBULENCE– A phenomenon that occurs when an aircraft develops lift and forms a pair of counter–rotating vortices.
(See AIRCRAFT CLASSES.)
(See VORTICES.)
(Refer to AIM.)

WARNING AREA–
(See SPECIAL USE AIRSPACE.)

WAYPOINT– A predetermined geographical position used for route/instrument approach definition, progress reports, published VFR routes, visual reporting points or points for transitioning and/or circumnavigating controlled and/or special use airspace, that is defined relative to a VORTAC station or in terms of latitude/longitude coordinates.

WEATHER ADVISORY– In aviation weather forecast practice, an expression of hazardous weather conditions not predicted in the Aviation Surface Forecast, Aviation Cloud Forecast, or area forecast, as they affect the operation of air traffic and as prepared by the NWS.
(See AIRMET.)
(See SIGMET.)

WEATHER RECONNAISSANCE AREA (WRA)– A WRA is airspace with defined dimensions and published by Notice to Air Missions, which is established to support weather reconnaissance/research flights. Air traffic control services are not provided within WRAs. Only participating weather reconnaissance/research aircraft from the 53rd Weather Reconnaissance Squadron and National Oceanic and Atmospheric Administration Aircraft Operations Center are permitted to operate within a WRA. A WRA may only be established in airspace within U.S. Flight Information Regions outside of U.S. territorial airspace.

WHEN ABLE–

a. In conjunction with ATC instructions, gives the pilot the latitude to delay compliance until a condition or event has been reconciled. Unlike "pilot discretion," when instructions are prefaced "when able," the pilot is expected to seek the first opportunity to comply.

b. In conjunction with a weather deviation clearance, requires the pilot to determine when he/she is clear of weather, then execute ATC instructions.

c. Once a maneuver has been initiated, the pilot is expected to continue until the specifications of the instructions have been met. "When able," should not be used when expeditious compliance is required.

WIDE-AREA AUGMENTATION SYSTEM (WAAS)– The WAAS is a satellite navigation system consisting of the equipment and software which augments the GPS Standard Positioning Service (SPS). The WAAS provides enhanced integrity, accuracy, availability, and continuity over and above GPS SPS. The differential correction function provides improved accuracy required for precision approach.

WIDE AREA MULTILATERATION (WAM)– A distributed surveillance technology which may utilize any combination of signals from Air Traffic Control Radar Beacon System (ATCRBS) (Modes A and C) and Mode S transponders, and ADS-B transmissions. Multiple geographically dispersed ground sensors measure the time-of-arrival of the transponder messages. Aircraft position is determined by joint processing of the time-difference-of-arrival (TDOA) measurements computed between a reference and the ground stations' measured time-of-arrival.

WILCO– I have received your message, understand it, and will comply with it.

WIND GRID DISPLAY– A display that presents the latest forecasted wind data overlaid on a map of the ARTCC area. Wind data is automatically entered and updated periodically by transmissions from the

National Weather Service. Winds at specific altitudes, along with temperatures and air pressure can be viewed.

WIND SHEAR– A change in wind speed and/or wind direction in a short distance resulting in a tearing or shearing effect. It can exist in a horizontal or vertical direction and occasionally in both.

WIND SHEAR ESCAPE– An unplanned abortive maneuver initiated by the pilot in command (PIC) as a result of onboard cockpit systems. Wind shear escapes are characterized by maximum thrust climbs in the low altitude terminal environment until wind shear conditions are no longer detected.

WING TIP VORTICES–
(See VORTICES.)

WORDS TWICE–

a. As a request: "Communication is difficult. Please say every phrase twice."

b. As information: "Since communications are difficult, every phrase in this message will be spoken twice."

WS–
(See SIGMET.)
(See WEATHER ADVISORY.)

WST–
(See CONVECTIVE SIGMET.)
(See WEATHER ADVISORY.)

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BRIEFING GUIDE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Initiated By: AJV−0
Vice President, Mission Support Services

Table of Contents

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10−7−5. EXTENDED NOTIFICATION

2. BACKGROUND: The Federal Women's Program (FWP) made the determination that the term Notice to Airmen did not represent all aviators. Hence, the term itself is modified to show gender neutrality.

3. CHANGE:

OLD	NEW
1−2−6. ABBREVIATIONS	**1−2−6. ABBREVIATIONS**
As used in this order, the abbreviations listed below have the following meanings indicated. (See TBL 1−2−1.)	No Change
TBL 1−2−1 **FAA Order JO 7110.65 Abbreviations**	No Change
NOTAM . . . . . Notice to Airmen	NOTAM . . . . . Notice to **Air Missions**

OLD	NEW
2−1−9. REPORTING ESSENTIAL FLIGHT INFORMATION	**2−1−9. REPORTING ESSENTIAL FLIGHT INFORMATION**
Report as soon as possible to the appropriate FSS, airport manager's office, ARTCC, approach control facility, operations office, or military operations office any information concerning components of the NAS or any flight conditions which may have an adverse effect on air safety.	No Change
NOTE− *FSSs are responsible for classifying and disseminating Notices to Airmen.*	***NOTE−*** *FSSs are responsible for classifying and disseminating Notices to **Air Missions**.*
REFERENCE− *FAA Order JO 7110.65, Para 3−3−3, Timely Information.* *FAA Order JO 7110.65, Para 5−1−6, Service Limitations.* *FAA Order JO 7210.3, Para 3−1−2, Periodic Maintenance.* *USN, See OPNAVINST 3721.30.*	No Change

OLD	NEW
10−6−4. INFLIGHT CONTINGENCIES	**10−6−4. INFLIGHT CONTINGENCIES**
Title through **a** ***NOTE***	No Change
b. In all cases of aircraft ditching, the airspace required for SAR operations must be determined by the RCC. The ACC must block that airspace until the RCC advises the airspace is no longer required. An International Notice to Airmen (NOTAM) must be issued describing the airspace affected.	**b.** In all cases of aircraft ditching, the airspace required for SAR operations must be determined by the RCC. The ACC must block that airspace until the RCC advises the airspace is no longer required. An International Notice to **Air Missions** (NOTAM) must be issued describing the airspace affected.

OLD

10−7−1. INFORMATION RELAY

Title through **b**

c. *TERMINAL.* Relay all information concerning a ground missile emergency to the ARTCC within whose area the emergency exists and disseminate as a NOTAM.

REFERENCE−
P/CG Term − Notice to Airmen.

NEW

10−7−1. INFORMATION RELAY

No Change

No Change

REFERENCE−
P/CG Term − Notice to ***Air Missions.***

OLD

10−7−5. EXTENDED NOTIFICATION

EN ROUTE

When reports indicate that an emergency will exist for an extended period of time, a Notice to Airmen may be issued.

NEW

10−7−5. EXTENDED NOTIFICATION

No Change

When reports indicate that an emergency will exist for an extended period of time, a Notice to **Air Missions** may be issued.

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1. PARAGRAPH NUMBER AND TITLE:
1−2−6. ABBREVIATIONS
4−2−1. CLEARANCE ITEMS
4−3−2. DEPARTURE CLEARANCES
4−8−9. MISSED APPROACH
5−6−1. APPLICATION
5−6−2. METHODS
5−6−3. VECTORS BELOW MINIMUM ALTITUDE
5−8−1. PROCEDURES
5−8−2. INITIAL HEADING

2. BACKGROUND: The Flight Standards Service (AFS) is revising its United States Standard for Terminal Instrument Procedures (TERPS) criteria at the request of Air Traffic Services (AJT) to account for a lack of criteria relating to conventional Radar Vector SIDs. In 2016, FAA Order 8260.58, United States Standard for Performance Based Navigation (PBN) Instrument Procedure Design, was amended assuming Air Traffic would be responsible for terrain and obstructions when aircraft are departing on PBN departure procedures by leveraging DVAs and the controller's use of 7110.65, paragraph 5−6−3, Vectors below Minimum Altitude. Meanwhile, it was found there was no criteria in TERPS that accounted for Radar Vector SIDs that were not sourced as PBN procedures. A request was made to AFS to include criteria for evaluations from the surface of the earth on these procedures rather than depend on the use of DVAs or paragraph 5−6−3. AFS is working to publish this criteria in 2021.

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

NEW

1−2−6. ABBREVIATIONS

No Change

No Change

Add	
Add	
Add	
PAR	Preferred arrival route
PDAR	Preferential departure arrival route
PDR	Preferential departure route

AAR	**Adapted arrival route**
ADAR	**Adapted departure arrival route**
ADR	**Adapted departure route**
Delete	
Delete	
Delete	

OLD

4–2–1. CLEARANCE ITEMS

Title through **b3** ***PHRASEOLOGY***

c. Standard Instrument Departure (SID).

d. Route of flight including PDR/PDAR/PAR when applied.

NEW

4–2–1. CLEARANCE ITEMS

No Change

c. Standard Instrument Departure (SID) **or vectors, where applicable**.

d. Route of flight including **A**DR/**A**DAR/**A**AR when applied.

OLD

4–3–2. DEPARTURE CLEARANCES

Title through **c1(a)(1)**

(2) Diverse Vector Areas (DVA). The assignment of an initial heading using a DVA can be given to the pilot as part of the initial clearance, but must be given no later than with the takeoff clearance. Once airborne, an aircraft assigned headings within the DVA can be vectored below the MVA/MIA. Controllers cannot interrupt an aircraft's climb in the DVA until the aircraft is at or above the MVA/MIA.

NOTE–

It is important for controllers to understand that there can be differences in published climb gradients applicable to individual departure procedures serving the same airport or runway. Assigning a different departure procedure without the pilot being able to re–brief may result in the pilot rejecting the new procedure.

Add

REFERENCE–

AIM, Para 5–2–7. Departure Control.
AIM, Para 5–2–9. Instrument Departure Procedures (DP) – Obstacle Departure Procedures (ODP) and Standard Instrument Departures (SID).

NEW

4–3–2. DEPARTURE CLEARANCES

No Change

No Change

NOTE–

1. *It is important for controllers to understand that there can be differences in published climb gradients applicable to individual departure procedures serving the same airport or runway. Assigning a different departure procedure without the pilot being able to re–brief may result in the pilot rejecting the new procedure.*

2. ***When a departure clearance includes a SID, concurrent use of a diverse vector area (DVA) is not permitted.***

No Change

OLD	NEW
4–8–9. MISSED APPROACH	**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.	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. **After** an aircraft commences a missed approach, it may be vectored **at or above the MVA/MIA, or follow the provisions of paragraph 5–6–3, Vectors Below Minimum Altitude**.
NOTE– **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.*	No Change
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.*	No Change
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.*	No Change
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, Para 5–5–5, Missed Approach.*	No Change

OLD	NEW
5–6–1. APPLICATION	**5–6–1. APPLICATION**
Title through **b**	No Change
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.	**c.** At or above the MVA or the minimum IFR altitude except as authorized for radar approaches, **radar departures,** special VFR, VFR operations, or by **p**aragraph 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.

No Change

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.

No Change

OLD

5–6–2. METHODS

Title through **c3**

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.

NEW

5–6–2. METHODS

No Change

d. When vectoring or approving an aircraft to deviate off of a procedure, advise the pilot if you intend on clearing the aircraft to resume the procedure.

No Change

No Change

OLD

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:

NEW

5–6–3. VECTORS BELOW MINIMUM ALTITUDE

a. TERMINAL. As described in facility directives, when vectoring a departing IFR aircraft, or one executing a missed approach, **when ISR is not displayed in the full data block** 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 **one of** 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.

Add

Add

Add

Add

Add

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).

Add

1. 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**, or;**

2. 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**, or;**

3. Radar facilities may vector aircraft below the MVA/MIA, provided:

(a) No prominent obstacles are within 10 NM of the departure end of runway (DER).

(b) Aircraft must be allowed an uninterrupted climb to meet the MVA/MIA within 10 NM of the DER.

NOTE–
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 if issued go–around instructions, except after conducting a visual approach. ATC does not assume this responsibility when utilizing a Diverse Vector Area (DVA) or when operating on SIDs with or without a published range of headings in the departure route description.

b. After reaching the first MVA/MIA sector, all subsequent MVA/MIA sectors encountered must be met.

No Change

c. 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.

Delete

d. At those locations using radar SIDs, radar facilities may vector aircraft below the MVA/MIA, in accordance with facility directives.

Add

e. At locations that vector aircraft conducting a go–around or missed approach, use authorized headings and display those prominent obstacles stipulated in facility directives until reaching the MVA/MIA.

Add

REFERENCE–
FAA Order JO 7110.65, Para 5–8–1, Procedures.
FAA Order JO 7210.3, Para 3–8–5, Establishing Diverse Vector Area/s (DVA).
FAA Order JO 7210.3, Para 10–3–15, Go–Around/Missed Approach.

OLD	NEW
5–8–1. PROCEDURES	**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.	Delete
Add	**a. When vectoring a departing aircraft on a radar SID, concurrent use of a diverse vector area (DVA) is not permitted.**
Add	**b. When the departure route description on a radar SID contains the phrase, "Fly assigned heading," "as assigned by ATC," or similar phrases, with a published range of headings in the route description, assign headings or vectors as needed not to exceed those headings in the published range until reaching the MVA/MIA.**
Add	***REFERENCE–*** ***FAA Order JO 7110.65, Para 5–6–3, Vectors Below Minimum Altitude.***

OLD	NEW
5–8–2. INITIAL HEADING	**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.	**a.** Before departure, assign the initial heading **consistent with either a SID being** flown **or DVA,** if **applicable, when** a departing aircraft is to be vectored immediately after takeoff. **At locations that have a DVA, concurrent use of both a SID and DVA is not permitted.**
PHRASEOLOGY– *FLY RUNWAY HEADING.* *TURN LEFT/RIGHT, HEADING (degrees).*	No Change
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.*	No Change

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 <u>are</u> issued go−around instructions, except when utilizing a Diverse Vector Area (DVA) <u>with an aircraft departing from the surface.</u>*	**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 **<u>if</u>** issued go−around instructions, except **<u>after conducting a visual approach. ATC does not assume this responsibility</u>** when utilizing a Diverse Vector Area (DVA) **<u>or when operating on SIDs with or without a published range of headings in the departure route description.</u>***
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.*	No Change
Add	**<u>b. At locations with both SIDs and DVAs, an amended departure clearance is required to cancel a previously assigned SID and subsequently utilize a DVA or vice versa. The amended clearance must be provided to the pilot in a timely manner so that the pilot may brief the changes in advance of entering the runway.</u>**
<u>b</u> and **<u>c</u>**	Re−letter **<u>c</u>** and **<u>d</u>**

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1. PARAGRAPH NUMBER AND TITLE:
2−1−3. PROCEDURAL PREFERENCE
11−1−1. DUTY RESPONSIBILITY
11−1−2. DUTIES AND RESPONSIBILITIES
11−1−3. TIME BASED FLOW MANAGEMENT (TBFM)

2. BACKGROUND: Trajectory−Based Operations (TBO) has been identified as the foundational air traffic management method for strategically planning, managing, and optimizing flights throughout the National Airspace System (NAS). TBO will improve NAS throughput, predictability, flight efficiency and flexibility. The increase in throughput is realized using time−based traffic management techniques and enabling the increased use of precise, repeatable Performance−Based Navigation procedures. Improved predictability is achieved through accurate and efficient end−to−end strategic planning and scheduling. Improved flight efficiency is achieved by delivering more efficient flows into and out of major traffic hubs and the increased use of PBN. Finally, increased operational flexibility will be achieved through increased user collaboration on preferred trajectories and priorities to support flight operator business objectives. The current procedures do not adequately convey TBO concepts nor do they have sufficient references or language emphasizing the importance of Time−Based Management (TBM) and the specific use of Time−Based Flow Management (TBFM) in achieving TBO goals.

3. CHANGE:

OLD	NEW
2–1–3. PROCEDURAL PREFERENCE	**2–1–3. PROCEDURAL PREFERENCE**
Title through **a**	No Change
Add	**b. Use automation procedures that provide closed loop clearances in preference to open loop clearances to promote operational advantage for time–based management (TBM) when workload permits. (e.g., a QU route pick that anticipates length of vector and includes the next fix that ties into the route of flight.)**
b and **c**	Re–letter **c** and **d**

OLD	NEW
11–1–1. DUTY RESPONSIBILITY	**11–1–1. DUTY RESPONSIBILITY**
Title through **a**	No Change
b. TBFM must be used to the maximum extent feasible in preference to miles–in–trail initiatives.	No Change
NOTE– *The benefits of TBFM are best realized through the coordinated effort of all facilities supporting Performance Based Navigation procedures or Traffic Management Initiatives (TMIs).*	Delete
c. It is recognized that the ATCS is integral in the execution of the traffic management mission.	No Change
NOTE– *Complete details of traffic management initiatives and programs can be found in FAA Order JO 7210.3, Facility Operation and Administration.*	***NOTE–*** *Complete details of **TBM,** traffic management initiatives and programs can be found in FAA Order JO 7210.3, Facility Operation and Administration.*

OLD	NEW
11–1–2. DUTIES AND RESPONSIBILITIES	**11–1–2. DUTIES AND RESPONSIBILITIES**
a. Supervisory Traffic Management Coordinator–in–Charge (STMCIC) must:	No Change
1. Ensure an operational briefing is conducted at least once during the day and evening shifts. Participants must include, at a minimum, the STMCIC, Operations Supervisor–in–Charge (OSMIC)/Controller–in–Charge (CIC) and other interested personnel as designated by facility management. Discussions at the meeting should include meteorological conditions (present and forecasted), staffing, equipment status, runways in use, Airport Arrival Rate (AAR)/Metering Parameters and Traffic Management Initiatives (TMIs) (present and anticipated).	**1.** Ensure an operational briefing is conducted at least once during the day and evening shifts. Participants must include, at a minimum, the STMCIC, Operations Supervisor–in–Charge (OSMIC)/Controller–in–Charge (CIC) and other interested personnel as designated by facility management. Discussions at the meeting should include meteorological conditions (present and forecasted), staffing, equipment status, runways in use, Airport Arrival Rate (AAR)**, TBM use,** and Traffic Management Initiatives (TMIs) (present and anticipated).
2. Assume responsibility for TMC duties when not staffed.	No Change

3. Ensure that TMIs are carried out by personnel providing traffic management services.

a4 and **a5**

6. Ensure changes to restrictions/metering are implemented in a timely manner.

b. OS/CIC must:

1. Keep the TMU and affected sectors apprised of situations or circumstances that may cause congestion or delays.

2. Coordinate with the TMU and personnel providing air traffic services to develop appropriate TMIs for sectors and airports in their area of responsibility.

3. Continuously review TMIs affecting their area of responsibility and coordinate with TMU for extensions, revisions, or cancellations.

4. Ensure that TMIs are carried out by personnel providing air traffic services.

b5 and **b6**

7. Ensure changes to TMIs are implemented in a timely manner.

c. Personnel providing air traffic services must:

1. Ensure that TMIs are enforced within their area of responsibility. TMIs do not have priority over maintaining:

c1(a) through **c2**

3. Continuously review TMIs affecting their area of responsibility and coordinate with OS/CIC and TMU for extensions, revisions, or cancellations.

c4 and **c5**

d. ARTCCs, unless otherwise coordinated, must:

1. Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to TMIs.

2. Monitor arrival flow for potential metering actions/changes and, if necessary, initiate coordination with all facilities to discuss the change to the metering plan.

e. TRACONs, unless otherwise coordinated, must:

3. Ensure that **TBM operations and** TMIs are carried out by personnel providing traffic management services.

No Change

6. Ensure changes to **TBM operations and TMIs** are implemented in a timely manner.

No Change

No Change

2. Coordinate with the TMU and personnel providing air traffic services to develop appropriate **TBM operations or** TMIs for sectors and airports in their area of responsibility.

3. Continuously review **TBM operations and** TMIs affecting their area of responsibility and coordinate with TMU for extensions, revisions, or cancellations.

4. Ensure that **TBM operations and** TMIs are carried out by personnel providing air traffic services.

No Change

7. Ensure changes to **TBM operations and** TMIs are implemented in a timely manner.

No Change

1. Ensure that **TBM operations and** TMIs are enforced within their area of responsibility. **TBM operations and** TMIs do not have priority over maintaining:

No Change

3. Continuously review **TBM operations and** TMIs affecting their area of responsibility and coordinate with OS/CIC and TMU for extensions, revisions, or cancellations.

No Change

No Change

1. Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to **TBM operations**.

No Change

No Change

1. Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to TMIs.	**1.** Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to **TBM operations**.
e2 and **e3**	No Change
f. ATCTs, unless otherwise coordinated, must:	No Change
1. Monitor TBFM equipment to improve situational awareness for a system approach to TMIs.	**1.** Monitor TBFM equipment to improve situational awareness for a system approach to **TBM operations**.
Add	**2. When equipped, and departure scheduling is in effect, use automation to obtain a departure release time from the TBM system.**
2. Release aircraft, when CFR is in effect, so they are airborne within a window that extends from 2 minutes prior and ends 1 minute after the assigned time.	**3. When departure scheduling or Call for Release is in effect, release aircraft** so they are airborne within a window that extends from 2 minutes prior and ends 1 minute after the assigned time**, unless otherwise coordinated**.
NOTE– *Coordination may be verbal, electronic, or written.*	No Change

OLD	NEW
11–1–3. TIME_BASED FLOW MANAGEMENT (TBFM)	**11–1–3. TIME–BASED FLOW MANAGEMENT (TBFM)**
During periods of metering, personnel providing air traffic services must:	No Change
a. Display TBFM schedule information on the main display monitor (MDM).	No Change
b. Comply with TBFM–generated metering times within +/– 1 minute.	No Change
1. If TBFM–generated metering time accuracy within +/– 1 minute cannot be used for specific aircraft due to significant jumps in the delay countdown timer (DCT), other TMIs may be used between those aircraft such as miles–in–trail (MIT) or minutes–in–trail (MINIT) to assist in delay absorption until stability resumes.	**1.** If TBFM–generated metering time accuracy within +/– 1 minute cannot be used for specific aircraft due to significant jumps in the delay countdown timer (DCT), **then** TMIs may be used between those aircraft such as miles–in–trail (MIT) or minutes–in–trail (MINIT) to assist in delay absorption until stability resumes.

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1. PARAGRAPH NUMBER AND TITLE: 2–1–26. SUPERVISORY NOTIFICATION

2. BACKGROUND: Suspicious Unmanned Aircraft System (UAS) operations potentially pose the same hazardous conditions as manned aircraft to the safety of flight. Therefore, it is imperative air traffic control personnel report any suspicious aircraft or pilot activity whether it involves manned or unmanned flights.

3. CHANGE:

OLD	NEW
2–1–26. SUPERVISORY NOTIFICATION	**2–1–26. SUPERVISORY NOTIFICATION**
Title through **e**	No Change

f. Possible suspicious aircraft/pilot activity as prescribed in FAA Order JO 7610.4, paragraph 7−3−1.	**f. Aircraft/pilot activity, including unmanned aircraft system (UAS) operation that is considered suspicious, as prescribed in FAA Order JO 7610.4, paragraph 7−3−1, and for information more specific to UAS, FAA Order JO 7210.3, paragraph 2−1−32.**
Add	***REFERENCE−*** ***P/CG Term − Suspicious UAS.***

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1. PARAGRAPH NUMBER AND TITLE: 4−3−2. DEPARTURE CLEARANCES

2. BACKGROUND: Confusion exists concerning the soliciting of Visual Climb over Airport (VCOA) procedures. Obstacle departure procedures (ODP) are published in the Takeoff Minimums section in the front of the Terminal Procedures Publication. The VCOA is an option to provide an alternative method to depart from a particular runway when the aircraft cannot meet published climb gradients, as long as the published weather minima are met. Where VCOA procedures are published, they typically appear in addition to the textual departure procedure within the ODP. Where both a textual departure procedure and a VCOA are published, ATC is currently not permitted to solicit the pilot's use of the VCOA, and the pilot is required to inform ATC of their intent to use the VCOA before departure. There are unique circumstances where the VCOA is the only published means to depart from a runway under instrument flight rules.

3. CHANGE:

OLD	**NEW**
4−3−2. DEPARTURE CLEARANCES	**4−3−2. DEPARTURE CLEARANCES**
Title through **c1(c)**	No Change
2. Where an obstacle departure procedure (ODP) has been published for a location and pilot compliance is necessary to ensure separation, include the procedure as part of the ATC clearance.	**2**. Where an ODP has been published for a location and pilot compliance is necessary to ensure separation, include the procedure as part of the ATC clearance. **Additionally, when an ODP is included in the clearance and the Visual Climb over Airport (VCOA) is requested by the pilot or assigned by ATC when it is the only procedure published in the ODP, include an instruction to remain within the published visibility of the VCOA.**
EXAMPLE− *"Depart via the (airport name)(runway number) departure procedure."* *Or* *"Depart via the (graphic ODP name) obstacle departure procedure."*	***EXAMPLE−*** *"Depart via the (airport name)(runway number)* ***obstacle*** *departure procedure.* ***Remain within (number of miles) miles of the (airport name) during visual climb" if applicable. Or,*** *"Depart via the (graphic ODP name) obstacle departure procedure.* ***Remain within (number of miles) miles of the (airport name) during visual climb" if applicable.***
Add	***NOTE−*** ***1. Pilots will advise ATC of their intent to use the VCOA option when requesting their IFR clearance.***
NOTE− *Some aircraft are required by 14 CFR 91.175 to depart a runway under IFR using the ODP absent other instructions from ATC.*	***2.*** *Some aircraft are required by 14 CFR 91.175 to depart a runway under IFR using the ODP absent other instructions from ATC.*

NOTE–
IFR takeoff minimums and obstacle departure procedures are prescribed for specific airports/runways and published in either a textual, or graphic form with the label (OBSTACLE) in the procedure title, and documented on an appropriate FAA Form 8260. To alert pilots of their existence, instruction approach procedure charts are annotated with a symbol:

3. Do not solicit use of the Visual Climb over Airport (VCOA) option.

NOTE–
Pilots will specifically advise ATC of their intent to use the VCOA option.

4. Compatibility with a procedure issued may be verified by asking the pilot if items obtained/solicited will allow him/her to comply with local traffic pattern, terrain, or obstruction avoidance.

PHRASEOLOGY–
FLY RUNWAY HEADING.

DEPART (direction or runway).

TURN LEFT/RIGHT.

WHEN ENTERING CONTROLLED AIRSPACE (instruction), FLY HEADING (degrees) UNTIL REACHING (altitude, point, or fix) BEFORE PROCEEDING ON COURSE.

FLY A (degree) BEARING/AZIMUTH FROM/TO (fix) UNTIL (time),

or

UNTIL REACHING (fix or altitude),

and if required,

BEFORE PROCEEDING ON COURSE.

EXAMPLE–
"Verify right turn after departure will allow compliance with local traffic pattern," or "Verify this clearance will allow compliance with terrain or obstruction avoidance."

NOTE–
If a published IFR departure procedure is not included in an ATC clearance, compliance with such a procedure is the pilot's prerogative.

5. SIDs:

3. *IFR takeoff minimums and obstacle departure procedures are prescribed for specific airports/runways and published in either a textual, or graphic form with the label (OBSTACLE) in the procedure title, and documented on an appropriate FAA Form 8260. To alert pilots of their existence, instrument approach procedure charts are annotated with a symbol:*

Delete

Delete

3. Compatibility with a procedure issued may be verified by asking the pilot if items obtained/solicited will allow him/her to comply with local traffic pattern, terrain, or obstruction avoidance.

No Change

No Change

No Change

4. SIDs:

(a) Assign a SID (including transition if necessary). Assign a PDR or the route filed by the pilot, only when a SID is not established for the departure route to be flown, or the pilot has indicated that he/she does not wish to use a SID.	**(a)** Assign a SID (including transition if necessary). Assign **an ADR/ADAR, when applicable** or the route filed by the pilot, when a SID is not established for the departure route to be flown, or the pilot has indicated that he/she does not wish to use a SID.
NOTE– *Departure procedure descriptive text contained within parentheses (for example, "Jimmy One (RNAV) Departure") is not included in departure clearance phraseology.*	No Change
PHRASEOLOGY– *(SID name and number) DEPARTURE.* *(SID name and number) DEPARTURE, (transition name) TRANSITION.*	No Change
EXAMPLE– *"Stroudsburg One Departure."* *"Stroudsburg One Departure, Sparta Transition."*	No Change
NOTE– *If a pilot does not wish to use a SID issued in an ATC clearance, or any other SID published for that location, he/she is expected to advise ATC.*	No Change

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1. PARAGRAPH NUMBER AND TITLE:
5–1–1. PRESENTATION AND EQUIPMENT PERFORMANCE
5–1–2. ALIGNMENT ACCURACY CHECK
5–1–3. ATC SURVEILLANCE SOURCE USE
5–1–4. BEACON RANGE ACCURACY
5–1–6. SERVICE LIMITATIONS
5–1–7. ELECTRONIC CURSOR
5–1–11. RADAR FIX POSTING
5–5–6. EXCEPTIONS

2. BACKGROUND: In all FAA radar facilities, radar mapping is always available, and "electronic cursors" are no longer used. In addition, alignment accuracy and beacon range accuracy are now assured by all FAA automation systems, and direct controller actions are no longer necessary. These manual alignment checks are still performed by some Air National Guard units that utilize legacy analog equipment for mobile deployments; however, the U.S. Air Force will publish appropriate procedures in their own air traffic manuals until that equipment is decommissioned.

3. CHANGE:

OLD	NEW
5–1–1. PRESENTATION AND EQUIPMENT PERFORMANCE	**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.	**a.** Provide radar service**s** 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.*	***NOTE–*** *The provision of radar service**s** 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.*
Add	**b. Notify the OS/CIC of any radar malfunctions or unexpected outages. Advise adjacent facilities when appropriate.**
Add	***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 12 Section 6.***
OLD	**NEW**
5–1–2. ALIGNMENT ACCURACY CHECK	Delete
TERMINAL	Delete
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.	Delete
REFERENCE– *FAA Order JO 7210.3, Chapter 3, Chapter 8, Chapter 9, Chapter 10, and Chapter 11.* *Comparable Military Directives.*	Delete
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.	Delete
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.	Delete
REFERENCE– *FAA Order JO 7210.3, Para 3–7–1, Tolerance for Radar Fix Accuracy.*	Delete
3. Digital Terminal Automation Systems (DTAS) conduct continuous self–monitoring of alignment accuracy; therefore, controller alignment checks are not required.	Delete
OLD	**NEW**
5–1–3. ATC SURVEILLANCE SOURCE USE	**5–1–2. ATC SURVEILLANCE SOURCE USE**
Title through **a2** ***NOTE 2***	No Change

(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.	**(c)** A secondary radar system is the only source of radar data for the area of service. *TERMINAL*. Advise pilots when these conditions exist.
NOTE– *Advisory may be omitted when provided on ATIS or by other appropriate notice to pilots.*	No Change
OLD	**NEW**
5–1–4. BEACON RANGE ACCURACY	Delete
a. You may use beacon targets for separation purposes if beacon range accuracy is verified by one of the following methods:	Delete
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.*	Delete
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.*	Delete
1. Correlate beacon and primary targets of the same aircraft (not necessarily the one being provided separation) to assure that they coincide.	Delete
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.	Delete
3. Refer to beacon range monitoring equipment where so installed.	Delete
b. If beacon range accuracy cannot be verified, you may use beacon targets only for traffic information.	Delete
REFERENCE– *FAA Order JO 7110.65, Para 5–1–3, Radar Use.*	Delete
5–1–5	Renumber **5–1–3**
OLD	**NEW**
5–1–6. SERVICE LIMITATIONS	Delete
a. When radar mapping is not available, limit radar services to:	Delete
1. Separating identified aircraft targets.	Delete

2. Vectoring aircraft to intercept a PAR final approach course.	Delete
3. Providing radar service in areas that ensure no confliction with traffic on airways, other ATC areas of jurisdiction, restricted or prohibited areas, terrain, etc.	Delete
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.	Delete
c. Report radar malfunctions immediately for corrective action and for dispatch of a Notice to Airmen. Advise adjacent ATC facilities when appropriate.	Delete
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.*	Delete

OLD	**NEW**
5–1–7. ELECTRONIC CURSOR	Delete
TERMINAL	Delete
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.	Delete
b. Fixed electronic cursors may be used to form the final approach course for surveillance approaches conducted by military operated mobile radar facilities.	Delete
5–1–8 through **5–1–10**	Renumber **5–1–4** through **5–1–6**

OLD	**NEW**
5–1–11. RADAR FIX POSTING	**5–1–7. MANUAL FIX POSTING**
EN ROUTE	No Change
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.	**M**anually record the observed or reported time over a fix **at least once** for each controlled aircraft in **your** sector of responsibility 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.*	***REFERENCE–*** *FAA Order JO 7210.3, Para 6–1–6, Flight Progress Strip Usage.*
5–1–12 and **5–1–13**	Renumber **5–1–8** and **5–1–9**

OLD	NEW
5−5−6. EXCEPTIONS	**5−5−6. EXCEPTIONS**
Title through **b3**	No Change
Add	**c. *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.**

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1. PARAGRAPH NUMBER AND TITLE:
5−2−1. ASSIGNMENT CRITERIA
5−2−2. DISCRETE ENVIRONMENT
5−2−3. NONDISCRETE ENVIRONMENT
5−2−4. MIXED ENVIRONMENT
5−2−5. HIJACK/UNLAWFUL INTERFERENCE
5−2−6. FUNCTION CODE ASSIGNMENTS
5−2−7. EMERGENCY CODE ASSIGNMENT
5−2−8. RADIO FAILURE
5−2−9. UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK
5−2−10. VFR CODE ASSIGNMENTS
5−2−11. BEACON CODE FOR PRESSURE SUIT FLIGHTS AND FLIGHTS ABOVE FL 600
5−2−14. CODE MONITOR

2. BACKGROUND: In the process of revising FAA Order JO 7110.66, National Beacon Code Allocation Plan, it was observed that there were references in that order to certain beacon code practices that have not been used for many years. The earliest secondary radar systems used two−digit ground interrogators and aircraft transponders, which only allowed for 64 radar beacon codes. Once the current four−digit, 4096−code systems became fully deployed across the NAS, the concepts of “function code assignments,” which were used to coordinate the assigned altitude stratum or other operational status of a flight; and “discrete,” “nondiscrete,” and “mixed” environments, which described whether a facility was using two−digit or four−digit beacon decoding equipment, became obsolete.

All current FAA ATC automation platforms are equipped with fully automatic beacon decoders, and will always force a target to appear on controllers’ displays when an aircraft transmits code 7500 (Hijack) or 7600 (Communication Failure). Those two codes, along with 7400 (UAS Lost Link) and 7700 (Emergency), are adapted in FAA ATC automation systems to display special characters in the data block instead of showing the beacon code itself. In ERAM, those characters are “LLNK” for 7400, “HIJK” for 7500, “RDOF” for 7600, and “EMRG” for 7700; and in STARS and MEARTS, those characters are “LL,” “HJ,” “RF,” and “EM,” respectively.

In response to a request from FAA System Operations Security, to keep potentially sensitive flight information from public exposure, the specific beacon code allocations for certain high−altitude flights have been moved to FAA Order JO 7610.4, Special Operations.

3. CHANGE:

OLD	NEW
5−2−1. ASSIGNMENT CRITERIA	**5−2−1. ASSIGNMENT CRITERIA**
Title through **a1**	No Change

2. Make beacon code assignments to only ADS−B and/or transponder−equipped aircraft.	No Change
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.*	***NOTE−*** *Aircraft equipped with ADS−B are also still required to have an operable transponder. The ATC−assigned* ***beacon*** *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.	**b.** Unless otherwise specified in **this section,** a **facility** directive**,** or a letter of agreement, **issue beacon codes assigned by the computer. Computer−assigned codes may be modified as required.**
Add	***NOTE−*** ***The computer will assign only discrete beacon codes unless all the discrete codes allocated to a facility are in use.***
Add	**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.**
Add	**2.** ***TERMINAL.*** **Unless otherwise specified in a facility directive or a letter of agreement, aircraft that will enter an adjacent facility's delegated airspace must be assigned a beacon code assigned by the ARTCC computer.**
Add	***NOTE−*** ***This will provide the adjacent facility advance information on the aircraft and will cause auto−acquisition of the aircraft prior to handoff. When an airborne 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, appropriate action should be taken to remove flight plan information on that aircraft.***
PHRASEOLOGY− *SQUAWK THREE/ALFA (code),* *or* *SQUAWK (code).*	No Change
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.*	Delete
REFERENCE− *FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B Identification Methods.*	***REFERENCE−*** *FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B Identification Methods.* ***FAA Order JO 7110.65, Para 5−3−4, Terminal Automation Systems Identification Methods.***

Add	**c. Code 4000 should be assigned when aircraft are operating on a flight plan specifying frequent or rapid changes in assigned altitude in more than one stratum or other category of flight not compatible with a discrete code assignment.**
Add	***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 frequencies is not required and frequent altitude changes are approved, and other flights requiring special handling by ATC.***
Add	**2.** ***Military aircraft operating in restricted/warning areas or on VR routes will squawk 4000 unless another code has been assigned or coordinated with ATC.***

OLD	NEW
5–2–2. DISCRETE ENVIRONMENT	Delete
a. Issue discrete beacon codes assigned by the computer. Computer–assigned codes may be modified as required.	Delete
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.	Delete
2. *TERMINAL.* Unless otherwise specified in a facility directive or a letter of agreement, aircraft that will enter an adjacent STARS facility's delegated airspace must be assigned a beacon code assigned by the ARTCC computer.	Delete
NOTE– **1.** *This will provide the adjacent facility advance information on the aircraft and will cause auto–acquisition of the aircraft prior to handoff.*	Delete
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.*	Delete
b. Make handoffs to other positions/sectors on the computer–assigned code.	Delete

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.	Delete
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 subparagraph c.*	Delete
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/ADS–B Identification Methods.*	Delete

OLD	**NEW**
5–2–3. NONDISCRETE ENVIRONMENT	Delete
a. Assign appropriate nondiscrete beacon codes from the function codes specified in paragraph 5–2–6, Function Code Assignments.	Delete
b. Unless otherwise coordinated at the time of handoff, make handoffs to other positions/sectors on an appropriate nondiscrete function code.	Delete
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/ADS–B Identification Methods.*	Delete

OLD	**NEW**
5–2–4. MIXED ENVIRONMENT	Delete
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.	Delete
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.*	Delete
b. When discrete beacon code capability exists in your area of responsibility:	Delete

1. Comply with the procedures specified in paragraph 5−2−2, Discrete Environment, and	Delete
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.	Delete
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/ADS−B Identification Methods.*	Delete
5−2−5	Renumber **5−2−2**

OLD	**NEW**
5−2−6. FUNCTION CODE ASSIGNMENTS	Delete
Unless otherwise specified by a directive or a letter of agreement, make nondiscrete code assignments from the following categories:	Delete
a. Assign codes to departing IFR aircraft as follows:	Delete
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.	Delete
2. Code 1100 to an aircraft which will remain below FL 240 or below FL 180 as above.	Delete
3. For handoffs from terminal facilities when so specified in a letter of agreement as follows:	Delete
(a) Within NBCAP airspace− **Code 0100 to Code 0400** inclusive or any other code authorized by the appropriate service area office.	Delete
(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.	Delete
b. Assign codes to en route IFR aircraft as follows:	Delete
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.*	Delete

2. *The provisions of subparagraphs 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.*	Delete
1. Aircraft operating below FL 240 or when control is transferred to a controller whose area includes the stratum involved.	Delete
(a) Code 1000 may be assigned to aircraft changing altitudes.	Delete
(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.	Delete
2. Aircraft operating at or above FL 240 or when control is transferred to a controller whose area includes the stratum involved.	Delete
(a) Code 2300 may be assigned to aircraft changing altitudes.	Delete
(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.	Delete
(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.	Delete
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.	Delete
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.*	Delete
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.*	Delete

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:	Delete
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.*	Delete
1. Code 2300 may be assigned for descents while above FL 240.	Delete
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.	Delete
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.	Delete
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/ADS−B Identification Methods.*	Delete

OLD	NEW
5−2−7. EMERGENCY CODE ASSIGNMENT	**5−2−3. EMERGENCY CODE ASSIGNMENT**
Assign codes to emergency aircraft as follows:	No Change
a. Code 7700 when the pilot declares an emergency and the aircraft is not radar identified.	No Change
PHRASEOLOGY− *SQUAWK MAYDAY ON 7700.*	No Change
Add	***NOTE−*** ***Instead of displaying "7700" in the data block, ERAM will display "EMRG," and STARS/MEARTS will display "EM."***
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.	**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 **a computer−assigned discrete** code.
NOTE− **1.** *The code change, based on pilot concurrence, the nature of the emergency, and current flight conditions will signify to other radar facilities that the aircraft in distress is identified and under ATC control.*	***NOTE−*** **1.** *The code change, based on pilot concurrence, the nature of the emergency, and current flight conditions, will signify to other **ATC** 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.*	**2.** *Pilots of single−piloted helicopters and single−piloted turbojet aircraft may be unable to* ***change*** *transponder* ***settings*** *during* ***an*** *emergency.*
PHRASEOLOGY− *RADAR CONTACT (position). IF FEASIBLE, SQUAWK (code).*	No Change
REFERENCE− *FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B Identification Methods.*	No Change
OLD	**NEW**
5−2−8. RADIO FAILURE	**5−2−4. RADIO FAILURE**
When you observe a **Code 7600** display, apply the procedures in paragraph 10−4−4, Communications Failure.	No Change
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****.*	***NOTE−*** ***1. An*** *aircraft experienc****ing*** *a loss of two−way radio communications capability can be expected to* ***squawk Code 7600****.*
Add	***2. Instead of displaying "7600" in the data block, ERAM will display "RDOF," and STARS/MEARTS will display "RF."***
REFERENCE− *FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B Identification Methods.*	No Change
OLD	**NEW**
Add	**5−2−5. HIJACK/UNLAWFUL INTERFERENCE**
Add	**When you observe a Code 7500 display, apply the procedures in paragraph 10−2−6, Hijacked Aircraft.**
Add	***NOTE−*** ***Instead of displaying "7500" in the data block, ERAM will display "HIJK," and STARS/MEARTS will display "HJ."***
Add	***REFERENCE−*** ***FAA Order JO 7110.65, Para 5−3−3, Beacon/ADS−B Identification Methods.***
OLD	**NEW**
5−2−9. UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK	**5−2−6. 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.	**Code 7400** may be **transmitted** 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:

No Change

Add

NOTE–
Instead of displaying "7400" in the data block, ERAM will display "LLNK," and STARS/MEARTS will display "LL."

OLD

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 subparagraph a should be selected. In the terminal environment, additional function codes may be authorized by the appropriate service area office.*

a1 through **a1(b)** ***NOTE***

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 firefighting 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.*

NEW

5–2–7. VFR CODE ASSIGNMENTS

a. For VFR aircraft receiving radar advisories, **issue a** computer–assigned **beacon** code.

Delete

Delete

No Change

b. Instruct **an** IFR aircraft **that** cancel**s its** IFR flight plan and **is** not requesting radar advisory service**, or a** VFR aircraft for which radar advisory service is being terminated**,** to squawk VFR.

No Change

NOTE–
1. *Aircraft not in contact with ATC may squawk **1255** in lieu of **1200** while en route to/from or within designated firefighting areas.*

2. *VFR aircraft **that** 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.*

OLD	NEW
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.*	**3.** ***VFR g**liders 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 JO 7110.66, National Beacon Code Allocation Plan.*	No Change
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.	**c.** When an aircraft changes from VFR to IFR, 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/ADS−B Identification Methods.*	No Change
5−2−11. BEACON CODE FOR PRESSURE SUIT FLIGHTS AND FLIGHTS ABOVE FL 600	**5−2−8. BEACON CODES 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.	**Special use** Mode 3/A **c**odes are reserved for **certain** pressure suit flights and aircraft operations above FL 600 **in accordance with FAA Order JO 7610.4, Special Operations**.
NOTE– *The specific allocation of the special use codes in subset 4400 is in FAA Order JO 7110.66, National Beacon Code Allocation Plan (NBCAP).*	Delete
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.	**a.** Ensure that **these flights** remain on one of the special use codes if filed **in** the flight plan**, except:**
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.*	Delete

REFERENCE– *FAA Order JO 7110.65, Para 5–3–3, Beacon/ADS–B Identification Methods.*	Delete
Add	**b. When unforeseen events cause more than one aircraft to be in the same or adjacent ARTCC's airspace at the same time on the same special use discrete code, if necessary, you may request the pilot to make a code change, squawk standby, or stop squawk as appropriate.**
Add	***NOTE–*** **1.** ***Current FAA automation systems track multiple targets on the same beacon code with much greater reliability than their predecessors, and a code change may not be necessary for such flights.***
Add	**2.** ***The beacon code is often preset on the ground for such flights and is used throughout the flight profile, including operations below FL 600. Due to equipment inaccessibility, the flight crew may not be able to accept transponder changes identified in this subparagraph.***
Add	**3.** ***In case of emergency, Code 7700 can still be activated. Instead of displaying "7700" in the data block, ERAM will display "EMRG," and STARS/MEARTS will display "EM."***
Add	***REFERENCE–*** ***FAA Order JO 7110.65, Para 5–3–3, Beacon/ADS–B Identification Methods.***
5–2–12 and **5–2–13**	Renumber **5–2–9** and **5–2–10**

OLD	**NEW**
5–2–14. CODE MONITOR	**5–2–11. 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.	Delete
REFERENCE– *FAA Order JO 7110.65, Para 5–2–6, Function Code Assignments.*	Delete
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.*	Delete
REFERENCE– *FAA Order JO 7210.3, Para 3–6–4, Monitoring of Mode 3/A Radar Beacon Codes.*	Delete

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.	**a. Continuously monitor the codes assigned to aircraft operating within your area of responsibility. A**dditionally, **monitor 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.	**b. When your area of responsibility** contains or **is** immediately adjacent to a restricted area, warning area, VR route, or other category where Code 4000 **is appropriate,** monitor **Code 4000** and any other code used in lieu of **4000**.
REFERENCE– *FAA Order JO 7110.65, Para 5–2–6, Function Code Assignments.*	***REFERENCE–*** ***FAA Order JO 7210.3, Para 3–6–3, Monitoring of Mode 3/A Radar Beacon Codes.***
c. If a normally assigned beacon code disappears, check for a response on the following codes in the order listed and take appropriate action:	Delete
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.*	Delete
1. Code 7500 (hijack code).	Delete
REFERENCE– *FAA Order JO 7110.65, Para 10–2–6, Hijacked Aircraft.*	Delete
2. Code 7600 (loss of radio communications code).	Delete
5–2–15 through **5–2–27**	Renumber **5–2–12** through **5–2–24**

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1. PARAGRAPH NUMBER AND TITLE: 5–3–3. BEACON/ADS–B IDENTIFICATION METHODS

2. BACKGROUND: When FAA Order JO 7110.65 migrated from version “H” to version “J”, many formatting changes occurred throughout the publication. During this process, the phraseology example in subparagraph 5–3–3d was captured incorrectly resulting in verbiage that was intended as a note of instruction to controllers being shown as phraseology to be issued to pilots. That change created an incorrect phraseology requirement when issuing a discrete beacon code for the purpose of surveillance identification.

3. CHANGE:

OLD	NEW
5–3–3. BEACON/ADS–B IDENTIFICATION METHODS	**5–3–3. BEACON/ADS–B IDENTIFICATION METHODS**
Title through **c** ***PHRASEOLOGY***	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
NOTE– *Paired LDBs in ERAM do not display a beacon code.*	No Change
PHRASEOLOGY– *SQUAWK (4 digit discrete code), AND IF YOUR ALTITUDE REPORTING EQUIPMENT IS TURNED OFF, SQUAWK ALTITUDE.*	***PHRASEOLOGY–*** *SQUAWK (4 digit discrete code),* ***or, if aircraft's altitude reporting capability is turned off,*** ***SQUAWK (4 digit discrete code), 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.*	No Change
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.*	No Change

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1. PARAGRAPH NUMBER AND TITLE: 9–2–13. MILITARY AERIAL REFUELING

2. BACKGROUND: In accordance with FAA Order JO 7610.4, Special Operations, paragraph 10–5–6, Flight Plan Requirements, military aerial refueling requires a block of consecutive altitudes to conduct these operations. These altitudes are normally requested as part of the refueling aircraft flight plan.

3. CHANGE:

OLD	NEW
9–2–13. MILITARY AERIAL REFUELING	**9–2–13. MILITARY AERIAL REFUELING**
Authorize aircraft to conduct aerial refueling along published or special tracks at their flight plan altitude, unless otherwise requested.	Authorize aircraft to conduct aerial refueling along published or special tracks at their flight plan **altitudes**, unless otherwise requested.

PHRASEOLOGY– *CLEARED TO CONDUCT REFUELING ALONG (number) TRACK,* *or* *FROM (fix) TO (fix)*, *and* *MAINTAIN REFUELING LEVEL (altitude),* *or* *MAINTAIN (altitude),* *or* *COMMENCING AT (altitude), DESCENDING TO (altitude).*	***PHRASEOLOGY–*** *CLEARED TO CONDUCT REFUELING ALONG (number) TRACK,* *or* *FROM (fix) TO (fix)*, *and* *MAINTAIN* ***BLOCK (altitude) THROUGH (altitude),*** *or* *COMMENCING AT (altitude), DESCENDING TO (altitude).*
NOTE– **1.** *During aerial refueling, tanker aircraft are responsible for receiver aircraft communication with ATC and for their navigation along the track.*	No Change
2. *Aerial refueling airspace is not sterilized airspace and other aircraft may transit this airspace provided vertical or lateral separation is provided from refueling aircraft.*	No Change
3. *MARSA begins between the tanker and receiver when the tanker and receiver(s) have entered the air refueling airspace and the tanker advises ATC that he/she is accepting MARSA.*	No Change
4. *MARSA ends between the tanker and receiver when the tanker advises ATC that the tanker and receiver aircraft are vertically positioned within the air refueling airspace and ATC advises MARSA is terminated.*	No Change
REFERENCE– *FAA Order JO 7110.65, Para 2–1–11, Use of MARSA.* *FAA Order JO 7110.65, Para 5–5–8, Additional Separation for Formation Flights.* *FAA Order JO 7610.4, Chapter 10, Aerial Refueling.*	No Change