CHANGE

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

JO 7110.65X
CHG 2

Effective Date:
September 13, 2018

SUBJ: Air Traffic Control

1. Purpose of This Change. This change transmits revised pages to Federal Aviation Administration Order JO 7110.65X, 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 which has editorial corrections and changes submitted through normal procedures. The Briefing Guide lists only new or modified material, along with background.

5. Distribution. This change is distributed to selected offices in Washington headquarters, regional offices, service area offices, the William J. Hughes Technical Center, and the Mike Monroney Aeronautical Center. Also, copies are sent to all air traffic field facilities and international aviation field offices; and to interested aviation public.

6. Disposition of Transmittal. Retain this transmittal until superseded by a new basic order.

7. Page Control Chart. See the page control chart attachment.

Original Signed By: *Jodi S. McCarthy*

Jodi S. McCarthy
Vice President, Mission Support Services
Air Traffic Organization

Date: August 7, 2018

Explanation of Changes
Change 2

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

a. 1–1–6. SUBMISSION CUTOFF AND EFFECTIVE DATES
1–1–8. RECOMMENDATIONS FOR PROCEDURAL CHANGES

This change adds language to clarify submission guidelines for changes to FAA Order JO 7110.65. It changes "Cutoff date for Submission" to "Cutoff date for Completion" to clarify that even after changes are submitted to the correspondence mailbox, several months of coordination are often still required before they are completed and submitted internally for publication. It also adds a Note referencing FAA Order JO 7000.5, Procedures for Submitting Changes to Air Traffic Control Publications.

b. 1–2–6. ABBREVIATIONS
5–9–7. SIMULTANEOUS INDEPENDENT APPROACHES– DUAL & TRIPLE
5–9–10. SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY–SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS

This change incorporates Established on RNP into simultaneous independent approaches, for both dual and triple operations. This change also incorporates Track–to–Fix legs into the existing widely–spaced criteria. This change cancels and incorporates Notice JO 7110.748, effective May 7, 2018.

c. 2–1–1. ATC SERVICE

This change incorporates the ATO policy that ATC services are not being provided to model aircraft or to any UAS operating at or below 400ft AGL. This change cancels and incorporates Notice JO 7110.746, effective April 16, 2018.

d. 2–1–13. FORMATION FLIGHTS

This change outlines controller responsibilities regarding formation flight join–up and clarifies controller responsibility during formation flight break–up. The language regarding pilot responsibilities during formation flight was also changed to language currently published in FAA Order JO 7610.4, the Pilot/Controller Glossary (P/CG), and in ICAO Annex 2. This change cancels and incorporates Notice JO 7110.750, effective May 3, 2018.

e. 2–9–2. OPERATING PROCEDURES

This change clarifies the requirements for ensuring pilots receive the most current pertinent Automatic Terminal Information Service (ATIS) information. The change adds clarity to the language regarding requirements to inform pilots of pertinent conditions that may impact operations. It places emphasis on broadcasting the message's change in conditions, when known, along with the ATIS code. This change helps reiterate the need to provide pilots with information relevant to conditions that could have an adverse effect on operations in and around the airport/terminal area.

f. 4–5–2. FLIGHT DIRECTION
8–1–4. TYPES OF SEPARATION
8–9–2. VERTICAL SEPARATION
8–9–4. LATERAL SEPARATION
8–9–5. COMPOSITE SEPARATION MINIMA
8–9–6. COMPOSITE SEPARATION ALTITUDE ASSIGNMENT
8–9–7. COMPOSITE SEPARATION APPLICATION

Composite Separation is not used in Offshore/Oceanic airspace for which the FAA exercises control. Research also reveals that the Japan Civil Aviation Bureau's (JCAB) implementation of the Trajectorized Oceanic Traffic Data Processing System will not support composite separation; therefore, Air Traffic Procedures has proposed the deletion of all composite separation references from FAA Order JO 7110.65.

g. 4–5–7. ALTITUDE INFORMATION

This change clarifies that after receiving a descend via clearance, aircraft navigating a published route inbound to a STAR can begin vertical navigation (VNAV) prior to being established on the procedure. Guidance and Notes were revised or reordered to achieve clarity and brevity.

h. 5–5–2. TARGET SEPARATION

This change corrects the reference from “digitized targets” to “digital targets” on ”digital” displays.

i. 5–5–4. MINIMA

This change expands 3–nautical mile (NM) operations in Microprocessor En Route Automated Radar Tracking System (MEARTS) facilities when using ASR–9 with Mode Sor ASR–11 MSSR Beacon as the preferred sensor site from 40 NM to 60 NM and raises the ceiling up to FL 230.

j. 5–5–9. SEPARATION FROM OBSTRUCTIONS

This change adds a provision that allows the use of 3–miles radar separation from obstructions when using a single sensor ASR–9 with Mode S or a single sensor ASR–11 with its MSSR beacon system when less than 60 miles from the antenna, or when operating in a FUSION environment, for a FUSION target symbol – 3 NM separation, and when ISR is displayed – 5 NM separation.

k. 5–6–2. METHODS

This change corrects a phraseology example, matching it to the prescribed phraseology.

l. Entire publication

Editorial changes include a fix to some font sizes, fixing a reference error in paragraph 5–8–5 and 3–9–10, a universal change for “interfacility” and “intrafacility,” and a clarification of “Alaska Only” for paragraph 4–7–6. Also fixed a formatting issue with Phraseology in 7–4–2 and 7–4–3. In 5–9–9, an incorrect word was replaced. Additional editorial/format changes were made where necessary. Revision bars were not used because of the insignificant nature of these changes.

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Chapter 1. General

Section 1. Introduction

1–1–1. PURPOSE OF THIS ORDER

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

1–1–2. AUDIENCE

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

1–1–3. WHERE TO FIND THIS ORDER

This order is available on the FAA Web site at http://www.faa.gov/regulations_policies/orders_notices.

1–1–4. WHAT THIS ORDER CANCELS

FAA Order JO 7110.65W, Air Traffic Control, dated December 10, 2015, and all changes to it are canceled.

1–1–5. EXPLANATION OF CHANGES

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

1–1–6. EFFECTIVE DATES AND SUBMISSIONS FOR CHANGES

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

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

TBL 1–1–1
Publication Schedule

Basic or Change	Cutoff Date for Completion	Effective Date of Publication
JO 7110.65X	4/27/17	10/12/17
Change 1	10/12/17	3/29/18
Change 2	3/29/18	9/13/18
Change 3	9/13/18	2/28/19
JO 7110.65Y	2/28/19	8/15/19

1–1–7. DELIVERY DATES

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

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

TBL 1–1–2
Military Distribution Contacts

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

1–1–8. RECOMMENDATIONS FOR PROCEDURAL CHANGES

The office of primary responsibility (OPR) for this order is:
FAA Headquarters, Mission Support Services
Air Traffic Procedures (AJV-8)
600 Independence Avenue, SW
Washington, DC 20597

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

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

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

NOTE–
For details on the submission process as well as additional AJV–8 processing responsibilities, please see FAA Order JO 7000.5 Procedures for Submitting Changes to Air Traffic Control Publications.

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

1–1–9. REQUESTS FOR INTERPRETATIONS OR CLARIFICATIONS TO THIS ORDER

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

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

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

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

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

1. The Service Center Operations Support Group may consult with the Air Traffic Procedures Directorate when preparing their response.

2. The Service Center Operations Support Group must provide a written response to the requestor and forward the response to the Air Traffic Procedures Directorate.

c. Interpretation requests from all other sources must be submitted, in writing, to the Air Traffic Procedures Directorate through the Air Traffic Procedures correspondence mailbox.

NOTE–
Interpretations can be accessed through the Air Traffic Control Interpretation link at the following website: https://my.faa.gov/org/linebusiness/ato/mission_support/air_traffic_procedures.html.

1–1–10. PROCEDURAL LETTERS OF AGREEMENT (LOA)

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

REFERENCE–
FAA Order JO 7110.65, Para 2–1–1 , ATC Service.
FAA Order JO 7210.3, Para 4–3–1, Letters of Agreement.

1–1–11. CONSTRAINTS GOVERNING SUPPLEMENTS AND PROCEDURAL DEVIATIONS

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

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

1–2–4. REFERENCES

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

1–2–5. ANNOTATIONS

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

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

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

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

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

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

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

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

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

NOTE–
Controllers may, after first using the prescribed phraseology for a specific procedure, rephrase the message to ensure the content is understood. Good judgment must be exercised when using nonstandard phraseology.

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

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

1–2–6. ABBREVIATIONS

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

TBL 1–2–1
FAA Order JO 7110.65 Abbreviations

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

Abbreviation	Meaning
ALTRV	Altitude reservation
AMASS	Airport Movement Area Safety System
AMB	Ambiguity–A disparity greater than 2 miles exists between the position declared for a target by ATTS 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
ARINC	Aeronautical Radio Incorporated
ARIP	Air refueling initial point
ARSR	Air route surveillance radar
ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
ASD	Aircraft Situation Display
ASDE	Airport surface detection equipment
ASDE–X . . .	Airport Surface Detection Equipment System – Model X
ASF	Airport Stream Filters
ASOS	Automated Surface Observing System
ASR	Airport surveillance radar
ASSC	Airport Surface Surveillance Capability
ATC	Air traffic control
ATCAA	ATC assigned airspace
ATCSCC	David J. Hurley Air Traffic Control System Command Center
ATD	Along–Track Distance
ATIS	Automatic Terminal Information Service
ATO	Air Traffic Organization
ATO COO . .	Air Traffic Organization Chief Operating Officer
ATOP	Advanced Technologies and Oceanic Procedures
ATS	Air Traffic Service
AWOS	Automated Weather Observing System
BAASS	Bigelow Aerospace Advanced Space Studies
BASE	Cloud base
CA	Conflict Alert
CARCAH . . .	Chief, Aerial Reconnaissance Coordination, All Hurricanes
CARF	Central Altitude Reservation Function
CARTS	Common ARTS

Abbreviation	Meaning
CAT	Clear air turbulence
CDT	Controlled departure time
CENRAP . . .	Center Radar ARTS Presentation
CEP	Central East Pacific
CERAP	Combined Center/RAPCON
CFR	Code of Federal Regulations
CFR	Call for Release
CIC	Controller–in–Charge
CNS	Continuous
CPDLC	Controller Pilot Data Link Communications
CPME	Calibration Performance Monitor Equipment
CTA	Control Area
CTRD	Certified Tower Radar Display
CVFP	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
EOS	End Service

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

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

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

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

Abbreviation	Meaning
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
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 5–1–8, 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 radar separation in preference to nonradar separation when it will be to an operational advantage and workload, communications, and equipment permit.

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

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

2–1–4. 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. Provide priority handling to civilian air ambulance flights (call sign "MEDEVAC"). Use of the MEDEVAC call sign indicates that operational priority is requested. When verbally requested, provide priority handling to AIR EVAC, HOSP, and scheduled air carrier/air taxi flights. Assist the pilots of MEDEVAC, AIR EVAC, and HOSP aircraft to avoid areas of significant weather and turbulent conditions. When requested by a pilot, provide notifications to expedite ground handling of patients, vital organs, or urgently needed medical materials.

NOTE–
Good judgment must be used in each situation to facilitate the most expeditious movement of a MEDEVAC aircraft.

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

lers 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 Airmen.

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.

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 sub-paragraph 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 9–2–14, 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, Paragraph 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, Paragraph 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, ARINC, 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, Para5–4–5 , 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 Transfer.
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 ARINC.

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–
Para 5–5–4, Minima, subparagraphs g and h specify the required radar wake turbulence separations. Time-based separations are contained in Para 3-9-6, Same Runway Separation, Para 3-9-7, Wake Turbulence Separation for Intersection Departures, Para 3-9-8, Intersecting Runway Separation, Para 3-9-9, Nonintersecting Converging Runway Operations, Para 3-10-3, Same Runway Separation, Para 3-10-4, Intersecting Runway Separation, Para 6-1-4, Adjacent Airport Operation, Para 6-1-5, Arrival Minima, and Para 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 may be encountered by aircraft in flight as well as when operating on the airport movement area. Because wake turbulence is unpredictable, the controller is not responsible for anticipating its existence or effect. Wake generated by super/heavy aircraft while climbing or descending through another aircraft's projected flight path may increase the chance of a wake encounter. Although not

mandatory during ground operations, controllers may use the words jet blast, propwash, or rotorwash, when issuing a caution advisory.

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."

REFERENCE–
FAA Order JO 7200.23A, Para. 2.C, Advisory Information.

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/USAF/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. Possible suspicious aircraft/pilot activity as prescribed in FAA Order JO 7610.4, paragraph 7–3–1.

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 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting, Para 84, Pilot Deviations.

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.

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 Baxter21 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

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.

Section 6. Weather Information

2–6–1. FAMILIARIZATION

Controllers must become familiar with pertinent weather information when coming on duty, and stay aware of current and forecasted weather information needed to perform ATC duties.

NOTE–
Every phase of flight has the potential to be impacted by weather, and emphasis must be placed on gathering, reporting and disseminating weather information.

2–6–2. PIREP SOLICITATION AND DISSEMINATION

Emphasis must be placed on the solicitation and dissemination of PIREPs. Timely dissemination of PIREPs alerts pilots to significant weather reports. PIREPS also provide information required by ATC to provide for the safe and efficient use of airspace. This includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, wind shear and turbulence (including clear air turbulence) of moderate or greater intensity, braking action, volcanic eruptions and volcanic ash clouds, detection of sulfur gases in the cabin, and other conditions pertinent to flight safety. Controllers must provide the information in sufficient detail to assist pilots in making decisions pertinent to flight safety.

REFERENCE–
FAA Order JO 7110.65, Para 3–1–8, Low Level Wind Shear/Microburst Advisories.
FAA Order JO 7110.65, Para 3–3–4, Braking Action.
P/CG Term– Braking Action.
FAA Order JO 7210.3, Para 6–3–1, Handling of SIGMETs, CWAs, and PIREPs.
AIM, Para 7–5–9, Flight Operations in Volcanic Ash.
FAA Order JO 7210.3, Para 10–3–1, SIGMET and PIREP Handling
FAA Order JO 7110.10, Chapter 9, Section 2, Pilot Weather Report (UA/UUA)

a. Solicit PIREPs when requested, deemed necessary or any of the following conditions exists or is forecast for your area of jurisdiction:

1. Ceilings at or below 5,000 feet. These PIREPs must include cloud base/top reports when feasible. When providing approach control services, ensure that at least one descent/climb–out PIREP, including cloud base(s), top(s), and other related phenomena, is obtained each hour.

2. Visibility (surface or aloft) at or less than 5 miles.

3. Thunderstorms and related phenomena.

4. Turbulence of moderate degree or greater.

5. Icing of light degree or greater.

6. Wind shear.

7. Braking action reports.

8. Volcanic ash clouds.

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

NOTE–
1. *The smell of sulfur gases in the cockpit may indicate volcanic activity that has not yet been detected or reported and/or possible entry into an ash–bearing cloud. SO2 is identifiable as the sharp, acrid odor of a freshly struck match. H2S has the odor of rotten eggs.*

2. *Pilots may forward PIREPs regarding volcanic activity using the format described in the Volcanic Activity Reporting Form (VAR) as depicted in the AIM, Appendix 2.*

b. Record with the PIREPs:

1. Time.

2. Aircraft position.

3. Type aircraft.

4. Altitude.

5. When the PIREP involves icing include:

(a) Icing type and intensity.

(b) Air temperature in which icing is occurring.

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

PHRASEOLOGY–
REQUEST/SAY FLIGHT CONDITIONS. Or if appropriate,
REQUEST/SAY (specific conditions; i.e., ride, cloud, visibility, etc.) CONDITIONS.
If necessary,
OVER (fix),

or

ALONG PRESENT ROUTE,

or

BETWEEN (fix) AND (fix).

d. Disseminate PIREPs as follows:

1. Relay pertinent PIREP information to concerned aircraft in a timely manner.

NOTE–
Use the word gain and/or loss when describing to pilots the effects of wind shear on airspeed.

EXAMPLE–
"Delta Seven Twenty–one, a Boeing Seven Thirty–seven, previously reported wind shear, loss of two five knots at four hundred feet."
"Alaska One, a Boeing Seven Thirty–seven, previously reported wind shear, gain of two–five knots between niner hundred and six hundred feet, followed by a loss of five zero knots between five hundred feet and the surface."

REFERENCE–
AIM, Para 7–1–24, Wind Shear PIREPs.

2. *EN ROUTE.* Relay all operationally significant PIREPs to the facility weather coordinator.

3. *TERMINAL.* Relay all operationally significant PIREPs to:

(a) The appropriate intrafacility positions.

(b) The OS/CIC for long line dissemination via an FAA approved electronic system (for example, AIS–R, or similar systems); or,

(c) Outside Alaska: The overlying ARTCC's Flight Data Unit for long–line dissemination.

(d) Alaska Only: The FSS serving the area in which the report was obtained.

NOTE–
The FSS in Alaska is responsible for long line dissemination.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–2, Duty Priority.

(e) Other concerned terminal or en route ATC facilities, including non–FAA facilities.

2–6–3. REPORTING WEATHER CONDITIONS

a. When the prevailing visibility at the usual point of observation, or at the tower level, is less than 4 miles, tower personnel must take prevailing visibility observations and apply the observations as follows:

1. Use the lower of the two observations (tower or surface) for aircraft operations.

2. Forward tower visibility observations to the weather observer.

3. Notify the weather observer when the tower observes the prevailing visibility decrease to less than 4 miles or increase to 4 miles or more.

b. Describe the wind as calm when the wind velocity is less than three knots.

REFERENCE–
FAA Order JO 7110.65, Para 3–5–3, Tailwind Components.
FAA Order JO 7110.65, Para 3–10–4, Intersecting Runway/Intersecting Flight Path Separation.

c. Forward current weather changes to the appropriate control facility as follows:

1. When the official weather changes to a condition:

(a) Less than a 1,000–foot ceiling or below the highest circling minimum, whichever is greater.

(b) Where the visibility is less than 3 miles.

(c) Where conditions improve to values greater than those listed in (a) and (b).

2. When changes which are classified as special weather observations during the time that weather conditions are below 1,000–foot ceiling or the highest circling minimum, whichever is greater, or less than 3 miles visibility.

d. Towers at airports where military turbo–jet en route descents are routinely conducted must also report the conditions to the ARTCC even if it is not the controlling facility.

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

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

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

2–6–4. ISSUING WEATHER AND CHAFF AREAS

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

Section 9. Automatic Terminal Information Service Procedures

2–9–1. APPLICATION

Use the ATIS, where available, to provide advance noncontrol airport/terminal area and meteorological information to aircraft.

a. Identify each ATIS message by a phonetic letter code word at both the beginning and the end of the message. Automated systems will have the phonetic letter code automatically appended. Exceptions may be made where omissions are required because of special programs or equipment.

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

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

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

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

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

2–9–2. OPERATING PROCEDURES

Maintain an ATIS message that reflects the most current arrival and departure information.

a. Make a new recording when any of the following occur:

1. Upon receipt of any new official weather regardless of whether there is or is not a change in values.

2. When runway braking action reports are received that indicate runway braking is worse than that which is included in the current ATIS broadcast.

3. When there is a change in any other pertinent data, such as runway change, instrument approach in use, new or canceled NOTAMs/PIREPs/HIWAS update, etc.

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

EXAMPLE–
"Latest ceiling/visibility/altimeter/wind/(other conditions) will be issued by approach control/tower."

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

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

EXAMPLE–
"Verify you have information CHARLIE."
"Information CHARLIE current. Advise when you have CHARLIE."

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

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

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

EXAMPLE–
"Attention all aircraft, information ALPHA current."

"Attention all aircraft, information BRAVO current. MICROBURST advisories in effect."

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

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

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

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

2–9–3. CONTENT

a. Include the following in ATIS broadcast as appropriate:

1. Airport/facility name.

2. Phonetic letter code.

3. Time of the latest weather sequence (UTC).

4. Weather information consisting of:

(a) Wind direction and velocity.

(b) Visibility.

(c) Obstructions to vision.

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

5. Instrument approach and runway in use.

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

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

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

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

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

REFERENCE–
FAA Order JO 7110.65, Para 10–2–13, MANPADS Alert.
FAA Order JO 7210.3, Para 2–1–9, Handling MANPADS Incidents.

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

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

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

REFERENCE–
FAA Order JO 7110.65, Para 10–2–14, Unauthorized Laser Illumination of Aircraft.
FAA Order JO 7210.3, Para 2–1–28, Reporting Unauthorized Laser Illumination of Aircraft.

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

EXAMPLE–
A remark may be made, "The weather is better than five thousand and five."

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

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

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

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

h. When a runway length has been temporarily or permanently shortened, ensure that the word "WARNING" prefaces the runway number, and that the word "shortened" is also included in the text of the message.

1. Available runway length, as stated in the NOTAM, must be included in the ATIS broadcast. This information must be broadcast for the duration of the construction project.

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

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

EXAMPLE–
"Warning, Runway One-Zero has been shortened, niner-thousand eight hundred and fifty feet available."

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

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

EXAMPLE–
"Runway Two Seven, condition codes two, two, one at one zero one eight Zulu."

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

j. Runway Condition Codes "3/3/3" and the statement "Slippery When Wet."

EXAMPLE–
"Runway (number) condition codes three, three, three, Slippery When Wet at one two five five Zulu."

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

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

EXAMPLE–
"Runway (number) condition codes missing at one three four seven Zulu."

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

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

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

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

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

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

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

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

"Baron Two Five Foxtrot, Runway One–Niner, extend downwind, tower will call your base, traffic holding in position."

(b) Do not authorize an aircraft to LUAW if an aircraft has been cleared to land, touch–and–go, stop–and–go, option, or unrestricted low approach on the same runway.

2. Except when reported weather conditions are less than ceiling 800 feet or visibility less than 2 miles, facilities using the safety logic system in the full core alert mode:

(a) May issue a landing clearance for a full–stop, touch–and–go, stop–and–go, option, or unrestricted low approach to an arriving aircraft with an aircraft holding in position or taxiing to LUAW on the same runway, or

(b) May authorize an aircraft to LUAW when an aircraft has been cleared for a full stop, touch–and–go, stop–and–go, option, or unrestricted low approach on the same runway.

REFERENCE–
FAA Order JO 7110.65, Para 3–10–5, Landing Clearance.

d. When an aircraft is authorized to line up and wait, inform it of the closest traffic within 6–flying miles requesting a full–stop, touch–and–go, stop–and– go, option, or unrestricted low approach to the same runway.

EXAMPLE–
"United Five, Runway One Eight, line up and wait. Traffic a Boeing Seven Thirty Seven, six mile final.

e. Do not authorize an aircraft to line up and wait when the departure point is not visible from the tower, unless the aircraft's position can be verified by ASDE or the runway is used for departures only.

f. An aircraft may be authorized to line up and wait at an intersection between sunset and sunrise under the following conditions:

1. The procedure must be approved by the appropriate Service Area Director of Air Traffic Operations.

2. The procedure must be contained in a facility directive.

3. The runway must be used as a departure–only runway.

4. Only one aircraft at a time is permitted to line up and wait on the same runway.

5. Document on FAA Form 7230–4, Daily Record of Facility Operation, the following: "LUAW at INT of RWY (number) and TWY (name) IN EFFECT" when using runway as a departure–only runway. "LUAW at INT of RWY (number) and TWY (name) SUSPENDED" when runway is not used as a departure–only runway.

g. Do not authorize an aircraft to line up and wait at anytime when the intersection is not visible from the tower.

h. Do not authorize aircraft to simultaneously line up and wait on the same runway, between sunrise and sunset, unless the local assist/local monitor position is staffed.

i. *USN*. Do not authorize aircraft to line up and wait simultaneously on intersecting runways.

PHRASEOLOGY–
CONTINUE HOLDING,

or

TAXI OFF THE RUNWAY.

REFERENCE–
FAA Order JO 7110.65, Para 3–10–10, Altitude Restricted Low Approach.

j. When aircraft are authorized to line up and wait on runways that intersect, traffic must be exchanged between that aircraft and the aircraft that is authorized to line up and wait, depart, or arrive to the intersecting runway(s).

EXAMPLE–
"United Five, Runway Four, line up and wait, traffic holding Runway Three–One."
"Delta One, Runway Three–One, line up and wait, traffic holding Runway Four."

Or, when issuing traffic information to an arrival aircraft and an aircraft that is holding on runway(s) that intersect(s):

"Delta One, Runway Four, line up and wait, traffic landing Runway Three–One."
"United Five, Runway Three–One, cleared to land. Traffic holding in position Runway Four."

Or, when issuing traffic information to a departing aircraft and an aircraft that is holding on runway(s) that intersect(s):

"Delta One, Runway Three–One, line up and wait, traffic departing Runway Four."
"United Five, Runway Four, cleared for takeoff, traffic holding in position Runway Three–One."

REFERENCE–
FAA Order JO 7110.65, Para 3–9–8, Intersecting Runway/Intersecting Flight Path Operations.
FAA Order JO 7110.65, Para 3–10–4, Intersecting Runway/Intersecting Flight Path Separation.

k. When a local controller delivers or amends an ATC clearance to an aircraft awaiting departure and that aircraft is holding short of a runway or is holding in position on a runway, an additional clearance must be issued to prevent the possibility of the aircraft inadvertently taxiing onto the runway and/or beginning takeoff roll. In such cases, append one of the following ATC instructions as appropriate:

1. HOLD SHORT OF RUNWAY, *or*

2. HOLD IN POSITION.

l. *USAF/USN.* When issuing additional instructions or information to an aircraft holding in takeoff position, include instructions to continue holding or taxi off the runway, unless it is cleared for takeoff.

PHRASEOLOGY–
CONTINUE HOLDING,

or

TAXI OFF THE RUNWAY.

REFERENCE–
FAA Order JO 7110.65, Para 3–10–10, Altitude Restricted Low Approach.

m. When authorizing an aircraft to line up and wait at an intersection, state the runway intersection.

PHRASEOLOGY–
RUNWAY (number) AT (taxiway designator), LINE UP AND WAIT.

n. When two or more aircraft call the tower ready for departure, one or more at the full length of a runway and one or more at an intersection, state the location of the aircraft at the full length of the runway when authorizing that aircraft to line up and wait.

PHRASEOLOGY–
RUNWAY (number), FULL–LENGTH, LINE UP AND WAIT.

EXAMPLE–
"American Four Eighty Two, Runway Three–Zero full length, line up and wait."

NOTE–
The controller need not state the location of the aircraft departing the full length of the runway if there are no aircraft holding for departure at an intersection for that same runway.

o. Do not use the term "full length" when the runway length available for departure has been temporarily shortened. On permanently shortened runways, do not use the term "full length" until the Chart Supplement U.S. is updated to include the change(s).

NOTE–
The use of the term "full length" could be interpreted by the pilot(s) as the available runway length prior to the runway being shortened.

p. Whenever a runway length has been temporarily or permanently shortened, state the word "shortened" immediately following the runway number as part of the line up and wait clearance.

1. The addition of "shortened" must be included in the line up and wait clearance for the duration of the construction project when the runway is temporarily shortened.

2. The addition of "shortened" must be included in the line up and wait clearance until the Chart Supplement U.S. is updated to include the change(s) when the runway is permanently shortened.

PHRASEOLOGY–
RUNWAY (number) SHORTENED, LINE UP AND WAIT.

EXAMPLE–
"Runway Two-Seven shortened, line up and wait."

REFERENCE–
FAA Order JO 7210.3, Para 10-3-11, Airport Construction
FAA Order JO 7210.3, Para 10-3-12, Change in Runway Length Due to Construction

3–9–5. ANTICIPATING SEPARATION

Takeoff clearance need not be withheld until prescribed separation exists if there is a reasonable assurance it will exist when the aircraft starts takeoff roll.

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

3–9–6. SAME RUNWAY SEPARATION

Separate a departing aircraft from a preceding departing or arriving aircraft using the same runway by ensuring that it does not begin takeoff roll until:

a. The other aircraft has departed and crossed the runway end or turned to avert any conflict. (See FIG 3–9–1.) If you can determine distances by

b. If the extended centerline of a runway crosses a converging runway or the extended centerline of a converging runway at a distance on 1NM or less from either departure end, apply the provisions of Para 3–9–8, Intersecting Runway/ Intersecting Flight Path Operations, unless the facility is using aids specified in a facility directive, (may include but are not limited to, Arrival/Departure Window (ADW), ASDE–X Virtual Runway Intersection Point (VRIP), cut–off points or automation). (See FIG 3–9–16 and FIG 3–9–17.)

REFERENCE–
FAA Order JO 7210.3, Para 10-3-14, Go-Around/Missed Approach

FIG 3–9–16
Intersecting Runway Separation

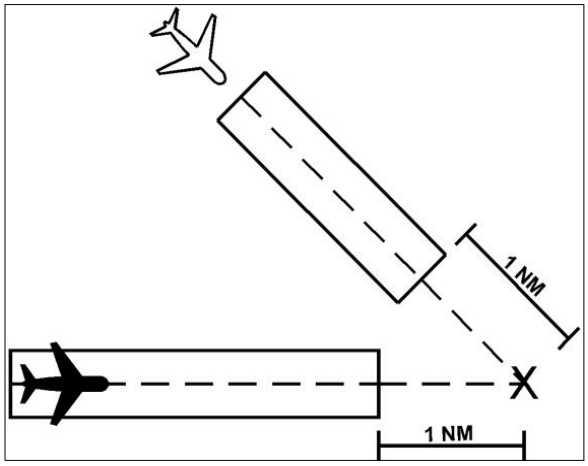
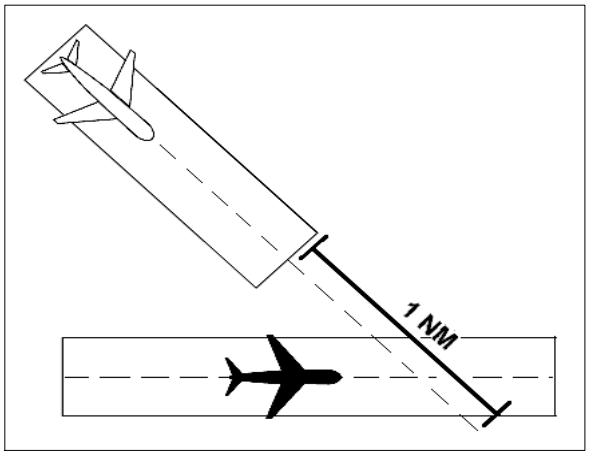


FIG 3–9–17
Intersecting Runway Separation



WAKE TURBULENCE APPLICATION

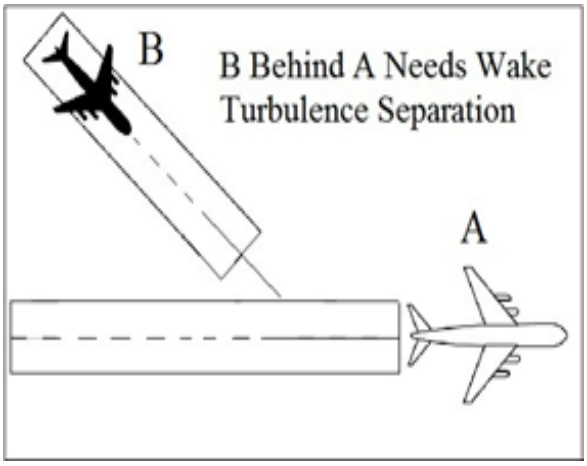
c. Separate aircraft taking off behind a departing aircraft on a crossing runway if projected flight paths will cross (See FIG 3–9–18):

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

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

3. Small behind B757 – *2 minutes.*

FIG 3–9–18
Intersecting Runway Separation



NOTE–
Takeoff clearance to the following aircraft should not be

issued until the time interval has passed from when the preceding aircraft began takeoff roll.

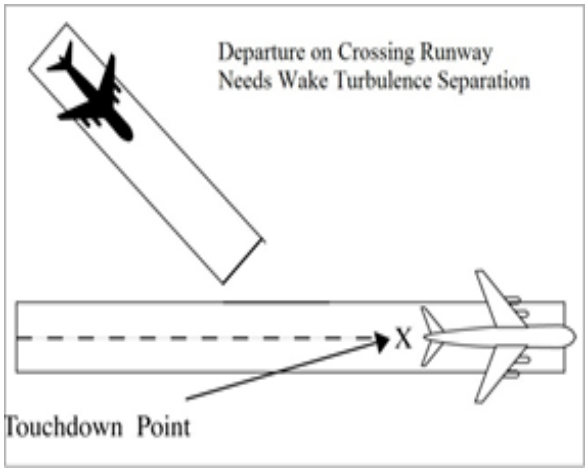
d. Separate aircraft departing behind a landing aircraft on a crossing runway if the departure will fly through the airborne path of the arrival (See FIG 3–9–19):

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

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

3. Small behind B757 – *2 minutes.*

FIG 3–9–19
Intersecting Runway Separation



e. Do not approve pilot requests to deviate from the required time interval if the preceding aircraft requires wake turbulence separation**.**

REFERENCE–
FAA Order JO 7110.65, Para 5-8-3, Successive or Simultaneous Departures.
FAA Order JO 7110.65, Para 5-8-5, Departures and Arrivals on Parallel or Nonintersecting Diverging Runways.
FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.

3–9–10. TAKEOFF CLEARANCE

a. When issuing a clearance for takeoff, first state the runway number followed by the takeoff clearance.

PHRASEOLOGY–
RUNWAY (number), CLEARED FOR TAKEOFF.

EXAMPLE–
"RUNWAY TWO SEVEN, CLEARED FOR TAKEOFF."

NOTE–
Turbine–powered aircraft may be considered ready for takeoff when they reach the runway unless they advise otherwise.

REFERENCE–
FAA Order JO 7110.65, Para 4–3–1, Departure Terminology.

b. When clearing an aircraft for takeoff from an intersection, state the runway intersection.

PHRASEOLOGY–
RUNWAY (number) AT (taxiway designator) CLEARED FOR TAKEOFF.

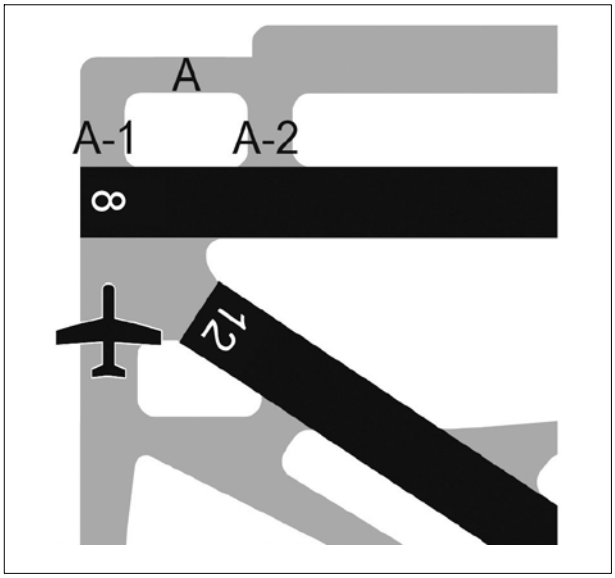
c. When two or more aircraft call the tower ready for departure, one or more at the full length of a runway and one or more at an intersection, state the location of the aircraft at the full length of the runway when clearing that aircraft for takeoff.

PHRASEOLOGY–
RUNWAY (number), FULL LENGTH, CLEARED FOR TAKEOFF.

EXAMPLE–
"American Four Eighty Two, Runway Three Zero full length, cleared for takeoff."

d. The controller must ensure that all runways along the taxi route that lead to the departure runway are crossed before the takeoff clearance is issued, except as stated in paragraph 3–9–10e.

FIG 3–9–20
Runway/Taxiway Proximity



e. At those airports where the airport configuration does not allow for an aircraft to completely cross one runway and hold short of the departure runway and/or where airports do not have runway hold markings

Section 5. Altitude Assignment and Verification

4–5–1. VERTICAL SEPARATION MINIMA

Separate instrument flight rules (IFR) aircraft using the following minima between altitudes:

a. Up to and including FL 410– 1,000 feet.

b. Apply 2,000 feet at or above FL 290 between non–RVSM aircraft and all other aircraft at or above FL 290.

c. Above FL 410– 2,000 feet, except:

1. In oceanic airspace, above FL 450 between a supersonic and any other aircraft– 4,000 feet.

2. Above FL 600 between military aircraft– 5,000 feet.

NOTE–
Oceanic separation procedures are supplemented in Chapter 8; Section 7, Section 8, Section 9, and Section 10.

REFERENCE–
FAA Order JO 7110.65, Para 5–5–5, Vertical Application.
FAA Order JO 7110.65, Para 6–6–1, Application.
FAA Order JO 7110.65, Para 9–2–15, Military Operations Above FL 600.

4–5–2. FLIGHT DIRECTION

Clear aircraft at altitudes according to the TBL 4–5–1.

TBL 4–5–1
Altitude Assignment

Aircraft Operating	On course degrees magnetic	Assign	Examples
Below 3,000 feet above surface	Any course	Any altitude	
At and below FL 410	0 through 179	Odd cardinal altitude or flight levels at intervals of 2,000 feet	3,000, 5,000, FL 310, FL 330
	180 through 359	Even cardinal altitude or flight levels at intervals of 2,000 feet	4,000, 6,000, FL 320, FL 340
Above FL 410	0 through 179	Odd cardinal flight levels at intervals of 4,000 feet beginning with FL 450	FL 450, FL 490, FL 530
	180 through 359	Odd cardinal flight levels at intervals of 4,000 feet beginning with FL 430	FL 430, FL 470, FL 510
One way routes (except in composite systems)	Any course	Any cardinal altitude or flight level below FL 410 or any odd cardinal flight level above FL 410	FL 270, FL 280, FL 290, FL 300, FL 310, FL 410, FL 430, FL 450
Within an ALTRV	Any course	Any altitude or flight level	
In aerial refueling tracks and anchors	Any course	Altitude blocks as requested. Any altitude or flight level	050B080, FL 180B220, FL 280B310

REFERENCE–
FAA Order JO 7110.65, Para 4–5–3, Exceptions.
FAA Order JO 7110.65, Para 7–7–5, Altitude Assignments.
FAA Order JO 7110.65, Para 9–3–2, Separation Minima.

4–5–3. EXCEPTIONS

When traffic, meteorological conditions, or aircraft operational limitations prevent assignment of altitudes prescribed in Para 4–5–2, Flight Direction, assign any cardinal altitude or flight level below FL 410 or any odd cardinal flight level at or above FL 410 without regard to direction of flight as follows:

NOTE–
See Para 2–3–10, Control Symbology, for control abbreviations and symbols to be used in conjunction with this paragraph.

a. For traffic conditions, take this action only if one of the following conditions exists:

1. Aircraft remain within a facility's area and prior approval is obtained from other affected positions or sectors or the operations are covered in a Facility Directive.

2. Aircraft will proceed beyond the facility's area and specific operations and procedures

permitting random altitude assignment are covered in a letter of agreement between the appropriate facilities.

b. Military aircraft are operating on random routes and prior approval is obtained from the facility concerned.

c. For meteorological conditions, take this action only if you obtain prior approval from other affected positions or sectors within your facility and, if necessary, from the adjacent facility concerned.

d. For aircraft operational limitations, take this action only if the pilot informs you the available appropriate altitude exceeds the operational limitations of his/her aircraft and only after you obtain prior approval from other affected positions or sectors within your facility and, if necessary, from the adjacent facility concerned.

e. For mission requirements, take this action only when the aircraft is operating on an MTR.

REFERENCE–
FAA Order JO 7110.65, Para 7–7–5, Altitude Assignments.
FAA Order JO 7110.65, Para 9–3–2, Separation Minima.

4–5–4. LOWEST USABLE FLIGHT LEVEL

If a change in atmospheric pressure affects a usable flight level in your area of jurisdiction, use TBL 4–5–2 to determine the lowest usable flight level to clear aircraft at or above 18,000 feet MSL.

TBL 4–5–2
Lowest Usable FL

Altimeter Setting	Lowest Usable FL
29.92” or higher	180
29.91” to 28.92”	190
28.91” to 27.92”	200

REFERENCE–
FAA Order JO 7110.65, Para 9–3–2, Separation Minima.

4–5–5. ADJUSTED MINIMUM FLIGHT LEVEL

When the prescribed minimum altitude for IFR operations is at or above 18,000 feet MSL and the atmospheric pressure is less than 29.92”, add the appropriate adjustment factor from TBL 4–5–3 to the flight level equivalent of the minimum altitude in feet to determine the adjusted minimum flight level.

TBL 4–5–3
Minimum FL Adjustment

Altimeter Setting	Adjustment Factor
29.92” or higher	None
29.91” to 29.42”	500 feet
29.41” to 28.92”	1,000 feet
28.91” to 28.42”	1,500 feet
28.41” to 27.92”	2,000 feet

4–5–6. MINIMUM EN ROUTE ALTITUDES (MEA)

Except as provided in subparas a and b below, assign altitudes at or above the MEA for the route segment being flown. When a lower MEA for subsequent segments of the route is applicable, issue the lower MEA only after the aircraft is over or past the Fix/NAVAID beyond which the lower MEA applies unless a crossing restriction at or above the higher MEA is issued.

a. An aircraft may be cleared below the MEA but not below the MOCA for the route segment being flown if the altitude assigned is at least 300 feet above the floor of controlled airspace and one of the following conditions are met:

NOTE–
Controllers must be aware that in the event of radio communications or GNSS failure, a pilot will climb to the MEA for the route segment being flown.

1. For aircraft using VOR, VORTAC or TACAN for navigation, this applies only within 22 miles of that NAVAID.

2. When radar procedures are used**,** the following actions are taken:

(a) In the absence of a published MOCA, assign altitudes at or above the MVA or MIA along the route of flight, and

(b) Lost communications instructions are issued.

3. The aircraft is GNSS equipped.

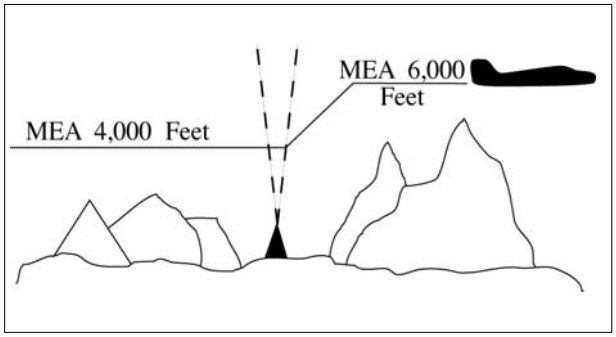
b. An aircraft may be cleared to operate on jet routes below the MEA (but not below the prescribed minimum altitude for IFR operations) or above the maximum authorized altitude if, in either case, radar service is provided.

NOTE–
Minimum en route and maximum authorized altitudes for certain jet route segments have been established above the floor of the jet route structure due to limitations on navigational signal coverage.

c. Where a higher altitude is required because of an MEA, the aircraft must be cleared to begin climb to the higher MEA as follows:

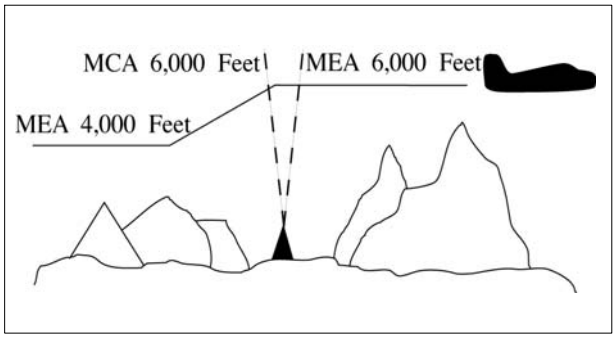
1. If no MCA is specified, prior to or immediately after passing the fix where the higher MEA is designated. (See FIG 4–5–1)

FIG 4–5–1
No MCA Specified



2. If a MCA is specified, prior to the fix so as to cross the fix at or above the MCA. (See FIG 4–5–2)

FIG 4–5–2
MCA Specified



d. GNSS MEAs may be approved on published ATS routes. Air traffic may assign GNSS MEAs to GNSS–equipped aircraft where established.

NOTE–
On high altitude ATS routes, the GNSS MEA is FL180 unless published higher.

e. Where MEAs have not been established, clear an aircraft at or above the minimum altitude for IFR operations prescribed by 14 CFR Section 91.177.

REFERENCE–
FAA Order JO 7110.65, Para 4–2–8, IFR-VFR and VFR-IFR Flights.
FAA Order JO 7110.65, Para 4–4–1, Route Use.
FAA Order JO 7110.65, Chapter 5, Section 6, Para 5–6–1, Application.
FAA Order JO 7110.65, Para 7–7–5, Altitude Assignments.

4–5–7. ALTITUDE INFORMATION

Issue altitude instructions as follows:

REFERENCE–
FAA Order JO 7110.65, Para 4–2–1, Clearance Items.

a. Altitude to maintain or cruise. When issuing cruise in conjunction with an airport clearance limit and an unpublished route will be used, issue an appropriate crossing altitude to ensure terrain clearance until the aircraft reaches a fix, point, or route where the altitude information is available to the pilot. When issuing a cruise clearance to an airport which does not have a published instrument approach, a cruise clearance without a crossing restriction may be issued.

PHRASEOLOGY–
MAINTAIN/CRUISE (altitude). MAINTAIN (altitude) UNTIL (time, fix, waypoint),

or

(number of miles or minutes) MILES/MINUTES PAST (fix, waypoint).

CROSS (fix, point, waypoint),

or

INTERCEPT (route) AT OR ABOVE (altitude), CRUISE (altitude).

NOTE–
1. *The crossing altitude must assure IFR obstruction clearance to the point where the aircraft is established on a segment of a published route or instrument approach procedure.*

2. *When an aircraft is issued a cruise clearance to an airport which does not have a published instrument approach procedure, it is not possible to satisfy the requirement for a crossing altitude that will ensure terrain clearance until the aircraft reaches a fix, point, or route where altitude information is available to the pilot. Under those conditions, a cruise clearance without a crossing restriction authorizes a pilot to determine the minimum IFR altitude as prescribed in 14 CFR Section 91.177 and descend to it at pilot discretion if it is lower than the altitude specified in the cruise clearance.*

b. Instructions to climb or descend including restrictions, as required. Specify a time restriction

reference the UTC clock reading with a time check. If you are relaying through an authorized communications provider, such as ARINC, FSS, etc., advise the radio operator to issue the current time to the aircraft when the clearance is relayed. The requirement to issue a time check must be disregarded if the clearance is issued via Controller Pilot Data Link Communications (CPDLC).

EXCEPTION. If you are in direct, two-way, VHF/UHF voice communication with the pilot and the aircraft is in radar contact, you may specify an elapsed time interval restriction, in full minute increments only, without any reference to the UTC clock. The time restriction begins once the clearance has been acknowledged by the pilot.

EXAMPLE–

1. *"United Four Seventeen, climb to reach one three thousand at two two one five."*
"Time two two one one and one–quarter."
The pilot is expected to be level at 13,000 feet at 2215 UTC.

2. Through Relay– *"Speedbird Five, climb to reach flight level three–five zero at one–two–one–five, time" (Issue a time check).*

3. *In radar contact and in direct controller to pilot, two-way, VHF/UHF voice communication - "United Four Seventeen, descend to reach flight level three five zero within two minutes." The time restriction begins once the clearance has been acknowledged by the pilot.*

4. *"United Four Seventeen climb to leave flight level three three zero within two minutes, maintain flight level three five zero."*

REFERENCE–
FAA Order JO 7110.65, Para 1–2–1, Word Meanings.
FAA Order JO 7110.65, Para 2–4–17, Numbers Usage.

PHRASEOLOGY–
CLIMB/DESCEND AND MAINTAIN (altitude).

If required,

AFTER PASSING (fix, waypoint),

or

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

CLIMB/DESCEND TO REACH (altitude)
AT (time (issue time check) or fix, waypoint),

or

AT (time). CLIMB/DESCEND AND MAINTAIN (altitude) WHEN ESTABLISHED AT LEAST (number of miles or minutes) MILES/MINUTES PAST (fix, waypoint) ON THE (NAVAID) (specified) RADIAL.
CLIMB/DESCEND TO REACH (altitude) AT (time or fix, waypoint),

or

A POINT (number of miles) MILES (direction) OF (name of DME NAVAID),

or

MAINTAIN (altitude) UNTIL (time (issue time check), fix, waypoint), THEN CLIMB/DESCEND AND MAINTAIN (altitude).

Through relay:

CLIMB TO REACH (altitude) AT (time) (issue a time check).

Or

Using a time interval while in radar contact and in direct controller to pilot, two-way, VHF/UHF voice communication:

CLIMB/DESCEND TO REACH/LEAVE (altitude) WITHIN (number) MINUTES, MAINTAIN (altitude).
Or

CLIMB/DESCEND TO REACH/LEAVE (altitude) IN (number) MINUTES OR LESS, MAINTAIN (altitude).

c. Specified altitude for crossing a specified fix or waypoint; or, specified altitude for crossing a distance (in miles) and direction from a specified fix or waypoint.

PHRASEOLOGY–
CROSS (fix, waypoint) AT (altitude).
CROSS (fix, waypoint) AT OR ABOVE/BELOW (altitude).
CROSS (number of miles) MILES (direction) OF (name of fix, waypoint) AT (altitude).
CROSS (number of miles) MILES (direction) OF (name of fix, waypoint) AT OR ABOVE/BELOW (altitude).

d. A specified altitude over a specified fix for that portion of a descent clearance where descent at pilot's discretion is permissible. At any other time it is practicable, authorize climb/descent at pilot's discretion.

PHRASEOLOGY–
CLIMB/DESCEND AT PILOT'S DISCRETION.

EXAMPLE–
"United Four Seventeen, descend and maintain six thousand."

NOTE–
The pilot is expected to commence descent upon receipt of the clearance and to descend at the suggested rates specified in the AIM, Para 4–4–10, Adherence to Clearance, until reaching the assigned altitude of 6,000 feet.

EXAMPLE–
"United Four Seventeen, descend at pilot's discretion, maintain six thousand."

NOTE–
The pilot is authorized to conduct descent within the context of the term "at pilot's discretion" as described in the AIM.

EXAMPLE–
"United Four Seventeen cross Lakeview V–O–R at or above flight level two zero zero, descend and maintain six thousand."

NOTE–
The pilot is authorized to conduct descent "at pilot's discretion" until reaching Lakeview VOR. The pilot must comply with the clearance provision to cross the Lakeview VOR at or above FL 200, and after passing Lakeview VOR, the pilot is expected to descend at the rates specified in the AIM until reaching the assigned altitude of 6,000 feet.

EXAMPLE–
"United Four Seventeen, cross Lakeview V–O–R at and maintain six thousand."

NOTE–
The pilot is authorized to conduct descent "at pilot's discretion," but must comply with the clearance provision to cross Lakeview VOR at 6,000 feet.

EXAMPLE–
"United Four Seventeen, descend now to flight level two seven zero, cross Lakeview V–O–R at or below one zero thousand, descend and maintain six thousand."

NOTE–
The pilot is expected to promptly execute and complete descent to FL 270 upon receipt of the clearance. After reaching FL 270, the pilot is authorized to descend "at pilot's discretion" until reaching Lakeview VOR. The pilot must comply with the clearance provision to cross Lakeview VOR at or below 10,000 feet. After Lakeview VOR, the pilot is expected to descend at the rates specified in the AIM until reaching 6,000 feet.

NOTE–
1. *A descent clearance which specifies a crossing altitude authorizes descent at pilot's discretion for that portion of the flight to which the crossing altitude restriction applies.*

2. *Any other time that authorization to descend at pilot's discretion is intended, it must be specifically stated by the controller.*

3. *The pilot may need to know of any future restrictions that might affect the descent, including those that may be issued in another sector, in order to properly plan a descent at pilot's discretion.*

4. *Controllers need to be aware that the descent rates in the AIM are only suggested and aircraft will not always descend at those rates.*

REFERENCE–
P/CG Term– Pilot's Discretion.

e. When a portion of a climb/descent may be authorized at the pilot's discretion, specify the altitude the aircraft must climb/descend to followed by the altitude to maintain at the pilot's discretion.

PHRASEOLOGY–
CLIMB/DESCEND NOW TO (altitude), THEN CLIMB/DESCEND AT PILOT'S DISCRETION MAINTAIN (altitude).

EXAMPLE–
"United Three Ten, descend now to flight level two eight zero, then descend at pilot's discretion maintain flight level two four zero."

NOTE–
1. *The pilot is expected to commence descent upon receipt of the clearance and to descend as prescribed in the AIM, Para 4–4–10, Adherence to Clearance, until FL 280. At that point, the pilot is authorized to continue descent to FL 240 within context of the term "at pilot's discretion" as described in the AIM.*

2. *Controllers need to be aware that the descent rates are only suggested and aircraft will not always descend at those rates.*

f. When the "pilot's discretion" portion of a climb/descent clearance is being canceled by assigning a new altitude, inform the pilot that the new altitude is an "amended altitude."

EXAMPLE–
"American Eighty Three, amend altitude, descend and maintain Flight Level two six zero."

NOTE–
American Eighty Three, at FL 280, has been cleared to descend at pilot's discretion to FL 240. Subsequently, the altitude assignment is changed to FL 260. Therefore, pilot's discretion is no longer authorized.

g. Altitude assignments involving more than one altitude.

PHRASEOLOGY–
MAINTAIN BLOCK (altitude) THROUGH (altitude).

h. Instructions to vertically navigate SIDs/STARs with published crossing restrictions (Climb Via/Descend Via).

1. When established on the SID/STAR.

2. When navigating a published route inbound to the STAR.

3. When cleared direct to a waypoint/fix without a published altitude, assign a crossing altitude.

PHRASEOLOGY–
DESCEND VIA (STAR name and number).

DESCEND VIA (STAR name and number and runway transition number)

DESCEND VIA (STAR name and number and runway number).

CLIMB VIA (SID name and number).

PROCEED DIRECT (fix/waypoint),CROSS (waypoint/fix) at (altitude) THEN DESCEND VIA (STAR name and number)

EXAMPLE–
"Descend via the Eagul Five arrival."

"Descend via the Wynde Eight Arrival, Runway 28 right transition."

"Descend via the Lendy One Arrival, Runway 22 left."

"Climb via the Dawgs Four Departure."

"Proceed direct Denis, cross Denis at or above flight level two zero zero, then descend via the Mmell One arrival."

NOTE–
Pilots must comply with all published speed restrictions on SIDs/STARs, independent of a climb via or descend via clearance.
Clearance to "descent via" authorizes pilots:
1. *To descend at pilot discretion to meet published restrictions on a STAR. Pilots navigating on a STAR must maintain the last assigned altitude until receiving clearance to descend via. Once leaving an altitude, the pilot may not return to that altitude without an ATC clearance.*
2. *When cleared direct to a waypoint, to descend at pilot discretion to meet restrictions on the procedure. ATC assumes obstacle clearance responsibility for aircraft not yet established or taken off of a procedure.*
3. *To adjust speeds prior to reaching waypoints with published speed restrictions.*

NOTE–
When cleared for SIDs that contain published speed restrictions, the pilot must comply with those speed restrictions independent of any "climb via" clearance. Clearance to "climb via" authorizes pilots:
1. *When used in the IFR departure clearance, in a PDC, DCL or when subsequently cleared after departure to a waypoint depicted on a SID, to join a procedure after departure or resume a procedure.*
2. *When vertical navigation is interrupted and an altitude is assigned to maintain which is not contained on the published procedure, to climb from that previously-assigned altitude at pilot's discretion to the altitude depicted for the next waypoint. ATC must ensure obstacle clearance until the aircraft is established on the lateral and vertical path of the SID.*
3. *Once established on the depicted departure, to climb and to meet all published or assigned altitude and speed restrictions.*

REFERENCE–
FAA Order JO 7110.65, Para 4–4–2, Route Structure Transitions
FAA Order JO 7110.65, Para 4–5–6, Minimum En Route Altitudes
FAA Order JO 7110.65, Para 5–5–9, Separation From Obstructions
PCG, Climb Via, Descend Via.

NOTE–
Pilots cleared for vertical navigation using the phraseology "descend via" or "climb via" must inform ATC, upon initial contact, of the altitude leaving, the runway transition or landing direction if assigned (STARs), and any assigned restrictions not published on the procedure.

EXAMPLE–
"Delta One Twenty One leaving flight level one niner zero, descending via the Eagul Five arrival runway two-six transition."

"Delta One Twenty One leaving flight level one niner zero for one two thousand, descending via the Eagul Five arrival, runway two-six transition."

"JetBlue six zero two leaving flight level two one zero descending via the Ivane Two arrival landing south."

"Cactus Seven Eleven leaving two thousand climbing via the Laura Two departure."

"Cactus Seven Eleven leaving two thousand for one-six thousand, climbing via the Laura Two departure."

REFERENCE–
AIM, Para 5-2-8, Instrument Departure Procedures (DP) – Obstacle Departure Procedures (ODP) and Standard Instrument Departures (SID)
PCG, Top Altitude, Bottom Altitude
AIM, Para 5-4-1, Standard Terminal Arrival (STAR) Procedures.

4. A "descend via" clearance must not be used where procedures contain only published "expect" altitude and/or speed restrictions.

NOTE–
Pilots are not expected to comply with published "expect" restrictions in the event of lost communications, unless ATC has specifically advised the pilot to expect these restrictions as part of a further clearance.

5. "Descend via" may be used on procedures that contain both "expect" and required altitude and speed restrictions only if altitude and/or speed restrictions or alternate restrictions are issued for the fix/waypoint associated with all expect restrictions.

6. "Descend via" clearances may also be issued if an aircraft is past all fixes/waypoints that have expect restrictions.

7. If it is necessary to assign a crossing altitude which differs from the STAR or SID altitude, emphasize the change to the pilot.

PHRASEOLOGY–
DESCEND VIA (STAR name and number) ARRIVAL, EXCEPT CROSS (fix, point, waypoint), (revised altitude information).

EXAMPLE–
"United 454 descend via the Haris One Arrival, except cross Haris at or above one six thousand."

NOTE–
The aircraft should track laterally and vertically on the Haris One Arrival and should descend so as to cross Haris at or above 16,000; remainder of the arrival must be flown as published.

PHRASEOLOGY–
CLIMB VIA SID, EXCEPT CROSS (fix, point, waypoint), (revised altitude information).

CLIMB VIA (SID name and number), EXCEPT CROSS (fix, point, waypoint), (revised altitude information).

EXAMPLE–
***1**. "Climb via SID except cross Mkala at or above seven thousand."*

NOTE–
In Example 1, the aircraft will comply with the assigned SID departure lateral path and any published speed and altitude restrictions and climb so as to cross Mkala at or above 7,000; remainder of the departure must be flown as published.

EXAMPLE–
***2**. (There is a published altitude at Dvine WP): "Proceed direct Dvine, Climb via the Suzan Two departure except cross Mkala at or above seven thousand."*

NOTE–
In Example 2, the aircraft will join the Suzan Two departure at Dvine, at the published altitude, and then comply with the published lateral path and any published speed or altitude restrictions. The aircraft will climb so as to cross Mkala at or above 7,000; remainder of the departure must be flown as published.

8. When an aircraft has been issued an interim altitude and after departure ATC can subsequently clear the aircraft to climb to the original top altitude published in a SID that contains published crossing restrictions, instruct aircraft to "climb via SID." When issuing a different altitude and compliance with published restrictions is still required, instruct aircraft to "climb via SID except maintain (altitude)."

PHRASEOLOGY–
CLIMB VIA SID.

CLIMB VIA SID except maintain (altitude).

EXAMPLE–
***1**. (An aircraft was issued the Teddd One departure, "climb via SID" in the IFR departure clearance. An interim altitude of 10,000 was issued instead of the published top altitude of FL 230; after departure ATC is able to issue the published top altitude): "Climb via SID."*

NOTE–
In Example 1, the aircraft will track laterally and vertically on the Teddd One departure and initially climb to 10,000; Once re-issued the "climb via" clearance the interim altitude is cancelled aircraft will continue climb to FL230 while complying with published restrictions.

EXAMPLE–
***2**. (Using Example 1, after departure ATC is able to issue an altitude higher than the published top altitude): "Climb via SID except maintain flight level two six zero."*

NOTE–
In Example 2, the aircraft will track laterally and vertically on the Teddd One departure and initially climb to 10,000; once issued "climb via" clearance to FL260 the aircraft will continue climb while complying with published restrictions.

9. If it is necessary to assign an interim altitude or assign a bottom or top altitude not contained on a STAR or SID, the provisions of subpara 4–5–7h may be used in conjunction with subpara 4–5–7a.

PHRASEOLOGY–
DESCEND VIA THE (STAR name and number) ARRIVAL EXCEPT AFTER (fix) MAINTAIN (revised altitude information).

EXAMPLE–
"United 454 descend via the Eagul Five Arrival, except after Geeno maintain one zero thousand."

NOTE–
The aircraft should track laterally and vertically on the Eagul Five Arrival and should descend so as to comply with all speed and altitude restrictions until reaching Geeno and then maintain 10,000. Upon reaching 10,000, aircraft should maintain 10,000 until cleared by ATC to continue to descend.

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

PHRASEOLOGY–
CLIMB VIA SID EXCEPT AFTER (waypoint name), MAINTAIN (altitude).

EXAMPLE–
"Climb via SID except after Baret, maintain flight level one niner zero."

NOTE–
1. *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, and authorizes an unrestricted climb or descent. Speed restrictions remain in effect unless the controller explicitly cancels the speed restrictions.*

2. *Restate "climb/descend via" and then use "except" or "except maintain" phraseology to modify published restrictions or assign a new top/bottom altitude. Use "resume" phraseology with "maintain" to rejoin a route and assign a new altitude where compliance with published altitude restrictions is not required.*

REFERENCE–
FAA Order JO 7110.65, Para 4–2–5, Route or Altitude Amendments
FAA Order JO 7110.65, Para 5–6–2, Methods
AIM 4-4-10 Adherence to Clearance
AIM, Para 5-2-8. Instrument Departure Procedures (DP) – Obstacle Departure Procedures (ODP) and Standard Instrument Departures (SID).

i. When a pilot is unable to accept a clearance, issue revised instructions to ensure positive control and approved separation.

NOTE–
1. *14 CFR Section 91.123 states that a pilot is not allowed to deviate from an ATC clearance "that has been obtained...unless an amended clearance is obtained" (except when an emergency exists).*

2. *A pilot is therefore expected to advise the controller if a clearance cannot be accepted when the clearance is issued. "We will try" and other such acknowledgements do not constitute pilot acceptance of an ATC clearance.*

3. *Controllers are expected to issue ATC clearances which conform with normal aircraft operational capabilities and do not require "last minute" amendments to ensure approved separation.*

4. *"Expedite" is not to be used in lieu of appropriate restrictions to ensure separation.*

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

4–5–8. ANTICIPATED ALTITUDE CHANGES

If practicable, inform an aircraft when to expect climb or descent clearance or to request altitude change from another facility.

PHRASEOLOGY–
EXPECT HIGHER/LOWER IN (number of miles or minutes) MILES/MINUTES,

or

AT (fix). REQUEST ALTITUDE/FLIGHT LEVEL CHANGE FROM (name of facility).

If required,

AT (time, fix, or altitude).

REFERENCE–
FAA Order JO 7110.65, Para 2–2–6, IFR Flight Progress Data.

4–5–9. ALTITUDE CONFIRMATION–NONRADAR

a. Request a pilot to confirm assigned altitude on initial contact and when position reports are received unless:

NOTE–
For the purpose of this paragraph, "initial contact" means a pilot's first radio contact with each sector/position.

1. The pilot states the assigned altitude, or

2. You assign a new altitude to a climbing or 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),

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

VERIFY ASSIGNED ALTITUDE (altitude).

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

VERIFY ASSIGNED FLIGHT LEVEL (flight level).

b. *USA*. Reconfirm all pilot altitude read backs.

PHRASEOLOGY–
(If altitude read back is correct),
AFFIRMATIVE (altitude).

(If altitude read back is not correct),
NEGATIVE. CLIMB/DESCEND AND MAINTAIN (altitude),

or

NEGATIVE. MAINTAIN (altitude).

2. Radar vectors will be provided to the final approach course.

EXAMPLE–
"Expect surveillance/precision approach to runway one seven; radar vectors to final approach course."

3. Current weather whenever the ceiling is below 1,000 feet (**USAF:** 1,500 feet) or the highest circling minimum whichever is greater, or when the visibility is less than 3 miles.

EXAMPLE–
"Expect ILS approach to runway eight; radar vectors to localizer course. Weather (reported weather)."

c. If ATIS is provided and the pilot advises he/she has received the current ATIS broadcast before the descent clearance in subpara b is issued, omit those items in subpara b that are contained in the broadcast.

d. To avoid requiring an aircraft to fly at low altitudes for an excessive distance, descent clearance should be issued at a point determined by adding 10 to the first two digits of the flight level.

EXAMPLE–
For FL 370, 37 + 10 = 47 miles.

NOTE–
Turbojet en route descents are based on a rate of descent of 4,000 to 6,000 feet per minute.

e. Do not terminate the en route descent of an aircraft without the consent of the pilot except as required by radar outage or an emergency situation.

REFERENCE–
FAA Order JO 7110.65, Para 4–8–4, Altitude Assignment for Military High Altitude Instrument Approaches.

4–7–6. ARRIVAL INFORMATION

EN ROUTE

a. Forward the following information to nonapproach control towers soon enough to permit adjustment of the traffic flow or to FSSs (Alaska Only) soon enough to provide local airport advisory where applicable:

1. Aircraft identification.

2. Type of aircraft.

3. ETA.

4. Type of instrument approach procedure the aircraft will execute; or

5. For SVFR, the direction from which the aircraft will enter Class B, Class C, Class D, or Class E surface area and any altitude restrictions that were issued; or

6. For aircraft executing a contact approach the position of the aircraft.

NOTE–
Specific time requirements are usually stated in a letter of agreement.

b. Forward the following information to approach control facilities before transfer of control jurisdiction:

NOTE–
Transfer points are usually specified in a letter of agreement.

1. Aircraft identification.

2. Type of aircraft and appropriate aircraft equipment suffix.

3. ETA or actual time, and proposed or actual altitude over clearance limit. The ETA need not be given if the arrival information is being forwarded during a radar handoff.

4. Clearance limit (when other than the destination airport) and EFC issued to the aircraft. Clearance limit may be omitted when provided for in a letter of agreement.

5. Time, fix, or altitude when control responsibility is transferred to the approach control facility. This information may be omitted when provided for in a letter of agreement.

PHRASEOLOGY–
(Identification), (type of aircraft), ESTIMATED/OVER (clearance limit), (time), (altitude), EFC (time).

If required,

YOUR CONTROL,

or

YOUR CONTROL AT (time, fix or altitude).

4–7–7. WEATHER INFORMATION

EN ROUTE

When an available official weather report indicates weather conditions are below a 1,000–foot (*USAF:* 1,500–foot) ceiling or below the highest circling minimum, whichever is higher, or less than three-miles visibility for the airport concerned, transmit the weather report and changes classified as

special weather observations to an arriving aircraft prior to or as part of the approach clearance when:

a. It is transmitted directly to the pilot via center controller-to-pilot communications.

b. It is relayed through a communications station other than an air carrier company radio or through a nonapproach control facility. You may do this by telling the station or nonapproach control facility to issue current weather.

4–7–8. BELOW MINIMA REPORT BY PILOT

If an arriving aircraft reports weather conditions are below his/her landing minima:

NOTE–
Determination that existing weather/visibility is adequate for approach/landing is the responsibility of the pilot/aircraft operator.

a. Issue appropriate instructions to the aircraft to hold or proceed to another airport.

b. Adjust, as necessary, the position in the landing sequence of any other aircraft desiring to make approaches and issue approach clearances accordingly.

4–7–9. TRANSFER OF JURISDICTION

Transfer radio communications and control responsibility early enough to allow the receiving facility to clear an aircraft beyond the clearance limit before the aircraft reaches it.

4–7–10. APPROACH INFORMATION

a. Both en route and terminal approach control sectors must provide current approach information to aircraft destined to airports for which they provide approach control services. This information must be provided on initial contact or as soon as possible thereafter. Approach information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code. For pilots destined to an airport without ATIS, items 3–5 below may be omitted after the pilot advises receipt of the automated weather; otherwise, issue approach information by including the following:

1. Approach clearance or type approach to be expected if two or more approaches are published and the clearance limit does not indicate which will be used.

2. Runway if different from that to which the instrument approach is made.

3. Surface wind.

4. Ceiling and visibility if the reported ceiling at the airport of intended landing is below 1,000 feet or below the highest circling minimum, whichever is greater, or the visibility is less than 3 miles.

5. Altimeter setting for the airport of intended landing.

REFERENCE–
FAA Order JO 7110.65, Chapter 2, Section 7, Altimeter Settings.

b. Upon pilot request, controllers must inform pilots of the frequency where automated weather data may be obtained and, if appropriate, that airport weather is not available.

PHRASEOLOGY–
(Airport) AWOS/ASOS WEATHER AVAILABLE ON (frequency).

1. ASOS/AWOS must be set to provide one minute weather at uncontrolled airports that are without ground–to–air weather broadcast capability by a CWO, NWS or FSS observer.

2. Controllers will consider the long–line disseminated weather from an automated weather system at an uncontrolled airport as trend information only and must rely on the pilot for the current weather information for that airport.

3. Controllers must issue the last long–line disseminated weather to the pilot if the pilot is unable to receive the ASOS/AWOS broadcast.

NOTE–
Aircraft destined to uncontrolled airports, which have automated weather data with broadcast capability, should monitor the ASOS/AWOS frequency to ascertain the current weather at the airport. The pilot should advise the controller when he/she has received the broadcast weather and state his/her intentions.

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

d. Advise pilots when the ILS on the runway in use is not operational if that ILS is on the same frequency as an operational ILS serving another runway.

Section 2. Beacon Systems

5–2–1. ASSIGNMENT CRITERIA

a. General.

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

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

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

PHRASEOLOGY–
SQUAWK THREE/ALFA (code),

or

SQUAWK (code).

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

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

5–2–2. DISCRETE ENVIRONMENT

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

1. *TERMINAL.* Aircraft that will remain within the terminal facility's delegated airspace must be assigned a code from the code subset allocated to the terminal facility.

2. *TERMINAL.* Unless otherwise specified in a facility directive or a letter of agreement, aircraft that will enter an adjacent ATTS facility's delegated airspace must be assigned a beacon code assigned by the ARTCC computer.

NOTE–
1. *This will provide the adjacent facility advance information on the aircraft and will cause auto-acquisition of the aircraft prior to handoff.*

2. *When an IFR aircraft, or a VFR aircraft that has been assigned a beacon code by the ARTCC computer and whose flight plan will terminate in another facility's area, cancels ATC service or does not activate the flight plan, ensure that appropriate action is taken to remove strips (RS message) on that aircraft.*

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

c. Coastal facilities accepting "over" traffic that will subsequently be handed-off to an oceanic ARTCC must reassign a new discrete beacon code to an aircraft when it first enters the receiving facility's airspace. The code reassignment must be accomplished by inputting an appropriate message into the computer and issued to the pilot while operating in the first sector/position in the receiving facility's airspace.

NOTE–
Per an agreement between FAA and the Department of Defense, 17 Code subsets in the NBCAP have been reserved for exclusive military use outside NBCAP airspace. To maximize the use of these subsets, they have been allocated to ARTCC's underlying NBCAP airspace that do not abut an oceanic ARTCC's area. To preclude a potential situation where two aircraft might be in the same airspace at the same time on the same discrete code, it is necessary to reassign an aircraft another code as specified in subpara c.

REFERENCE–
FAA Order JO 7110.65, Para 5–2–4, Mixed Environment.
FAA Order JO 7110.65, Para 5–2–9, VFR Code Assignments.
FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

5–2–3. NONDISCRETE ENVIRONMENT

a. Assign appropriate nondiscrete beacon codes from the function codes specified in Paragraph 5–2–6, Function Code Assignments.

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

REFERENCE–
FAA Order JO 7110.65, Para 5–2–4, Mixed Environment.
FAA Order JO 7110.65, Para 5–2–9, VFR Code Assignments.
FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

5–2–4. MIXED ENVIRONMENT

a. When discrete beacon code capability does not exist in your area of responsibility, comply with the

procedures specified in Paragraph 5–2–3, Nondiscrete Environment.

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

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

1. Comply with the procedures specified in Paragraph 5–2–2, Discrete Environment, and

2. Unless otherwise coordinated at the time of handoff, assign aircraft that will enter the area of responsibility of a nondiscrete-equipped position/sector an appropriate nondiscrete function code from the codes specified in Paragraph 5–2–6, Function Code Assignments, prior to initiating a handoff.

REFERENCE–
FAA Order JO 7110.65, Para 4–2–8, IFR-VFR and VFR-IFR Flights.
FAA Order JO 7110.65, Para 5–2–9, VFR Code Assignments.
FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

5–2–5. RADAR BEACON CODE CHANGES

Unless otherwise specified in a directive or a letter of agreement or coordinated at the time of handoff, do not request an aircraft to change from the code it was squawking in the transferring facility's area until the aircraft is within your area of responsibility.

REFERENCE–
FAA Order JO 7110.65, Para 4–2–8, IFR-VFR and VFR-IFR Flights.
FAA Order JO 7110.65, Para 5–3–3, Beacon Identification Methods.

5–2–6. FUNCTION CODE ASSIGNMENTS

Unless otherwise specified by a directive or a letter of agreement, make nondiscrete code assignments from the following categories:

a. Assign codes to departing IFR aircraft as follows:

1. Code 2000 to an aircraft which will climb to FL 240 or above or to an aircraft which will climb to FL 180 or above where the base of Class A airspace and the base of the operating sector are at FL 180, and for interfacility handoff the receiving sector is also stratified at FL 180. The en route code must not be assigned until the aircraft is established in the high altitude sector.

2. Code 1100 to an aircraft which will remain below FL 240 or below FL 180 as above.

3. For handoffs from terminal facilities when so specified in a letter of agreement as follows:

(a) Within NBCAP airspace– **Code 0100 to Code 0400** inclusive or any other code authorized by the appropriate service area office.

(b) Outside NBCAP airspace– **Code 1000** or one of the codes from **0100 to 0700** inclusive or any other code authorized by the appropriate service area office.

b. Assign codes to en route IFR aircraft as follows:

NOTE–
1. *FL 180 may be used in lieu of FL 240 where the base of Class A airspace and the base of the operating sector are at FL 180, and for interfacility handoff the receiving sector is also stratified at FL 180.*

2. *The provisions of subparas b2(b) and (c) may be modified by facility directive or letter of agreement when operational complexities or simplified sectorization indicate. Letters of agreement are mandatory when the operating sectors of two facilities are not stratified at identical levels. The general concept of utilizing* ***Codes 2100 through 2500*** *within Class A airspace should be adhered to.*

1. Aircraft operating below FL 240 or when control is transferred to a controller whose area includes the stratum involved.

(a) Code 1000 may be assigned to aircraft changing altitudes.

(b) Code 1100 to an aircraft operating at an assigned altitude below FL 240. Should an additional code be operationally desirable, **Code 1300** must be assigned.

2. Aircraft operating at or above FL 240 or when control is transferred to a controller whose area includes the stratum involved.

(a) Code 2300 may be assigned to aircraft changing altitudes.

(b) Code 2100 to an aircraft operating at an assigned altitude from FL 240 to FL 330 inclusive. Should an additional code be operationally desirable, **Code 2200** must be assigned.

(c) Code 2400 to an aircraft operating at an assigned altitude from FL 350 to FL 600 inclusive. Should an additional code be operationally desirable, **Code 2500** must be assigned.

3. Code 4000 when aircraft are operating on a flight plan specifying frequent or rapid changes in

assigned altitude in more than one stratum or other conditions of flight not compatible with a stratified code assignment.

NOTE–
1. *Categories of flight that can be assigned* ***Code 4000*** *include certain flight test aircraft, MTR missions, aerial refueling operation requiring descent involving more than one stratum, ALTRVs where continuous monitoring of ATC communications facilities is not required and frequent altitude changes are approved, and other aircraft operating on flight plans requiring special handling by ATC.*

2. *Military aircraft operating VFR or IFR in restricted/warning areas or VFR on VR routes will adjust their transponders to reply on* ***Code 4000*** *unless another code has been assigned by ATC or coordinated, if possible, with ATC.*

c. Assign the following codes to arriving IFR aircraft, except military turbojet aircraft as specified in Paragraph 4–7–4, Radio Frequency and Radar Beacon Changes for Military Aircraft:

NOTE–
FL 180 may be used in lieu of FL 240 where the base of Class A airspace and the base of the operating sector are at FL 180, and for interfacility handoff the receiving sector is also stratified at FL 180.

1. Code 2300 may be assigned for descents while above FL 240.

2. Code 1500 may be assigned for descents into and while within the strata below FL 240, or with prior coordination the specific code utilized by the destination controller, or the code currently assigned when descent clearance is issued.

3. The applicable en route code for the holding altitude if holding is necessary before entering the terminal area and the appropriate code in subparas 1 or 2.

REFERENCE–
FAA Order JO 7110.65, Para 4–2–8 , IFR-VFR and VFR-IFR Flights.
FAA Order JO 7110.65, Para 5–2–3 , Nondiscrete Environment.
FAA Order JO 7110.65, Para 5–2–4 , Mixed Environment.
FAA Order JO 7110.65, Para 5–2–9 , VFR Code Assignments.
FAA Order JO 7110.65, Para 5–3–3 , Beacon Identification Methods.

5–2–7. EMERGENCY CODE ASSIGNMENT

Assign codes to emergency aircraft as follows:

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

PHRASEOLOGY–
SQUAWK MAYDAY ON 7700.

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

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

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

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

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

c. The following must be accomplished on a Mode C equipped VFR aircraft which is in emergency but no longer requires the assignment of **Code 7700**:

1. *TERMINAL.* Assign a beacon code that will permit terminal minimum safe altitude warning (MSAW) alarm processing.

2. *EN ROUTE.* An appropriate keyboard entry must be made to ensure en route MSAW (EMSAW) alarm processing.

5–2–8. RADIO FAILURE

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

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

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

5–2–9. UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK

Code 7400 may be displayed by unmanned aircraft systems (UAS) when the control link between the aircraft and the pilot is lost. Lost link procedures are programmed into the flight management system and associated with the flight plan being flown.

When you observe a Code 7400 display, do the following:

a. Determine the lost link procedure, as outlined in the Special Airworthiness Certificate or Certificate of Waiver or Authorization (COA).

b. Coordinate, as required, to allow UAS to execute the lost link procedure.

c. Advise Operations Supervisor (OS), when feasible, so the event can be documented.

d. If you observe or are informed by the PIC that the UAS is deviating from the programmed Lost Link procedure, or is encountering another anomaly, treat the situation in accordance with FAA Order J0 7110.65 Chapter 10, Section 1, Paragraph 10–1–1c.

NOTE–
1. *The available lost link procedure should, at a minimum, include lost link route of flight, lost link orbit points, lost link altitudes, communications procedures and preplanned flight termination points if the event recovery of the UAS is deemed unfeasible.*

2. *Each lost link procedure may differ and is dependent upon airframe and operation. These items are contained in the flight's Certificate of Authorization or Waiver (COA) and must be made available to ATC personnel in their simplest form at positions responsible for Unmanned Aircraft (UAs).*

3. *Some UA airframes (Global Hawk) will not be programmed upon the NAS Automation roll out to squawk 7400. These airframes will continue to squawk 7600 should a lost link occur. The ATC Specialist must apply the same procedures described above.*

5–2–10. VFR CODE ASSIGNMENTS

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

NOTE–
1. *Paragraph 5–2–2 , Discrete Environment; Paragraph 5–2–3, Nondiscrete Environment, and Paragraph 5–2–4, Mixed Environment, specify code assignment procedures to follow for the three code environments.*

2. *Paragraph 5–2–6 , Function Code Assignments, specifies the function code allocation from which an appropriate code for the aircraft indicated in subpara a should be selected. In the terminal environment, additional function codes may be authorized by the appropriate service area office.*

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

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

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

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

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

PHRASEOLOGY–
SQUAWK VFR.

or

SQUAWK 1200.

NOTE–
1. *Aircraft not in contact with an ATC facility may squawk 1255 in lieu of 1200 while en route to/from or within the designated fire fighting area(s).*

2. *VFR aircraft which fly authorized SAR missions for the USAF or USCG may be advised to squawk 1277 in lieu of 1200 while en route to/from or within the designated search area.*

3. *Gliders not in contact with an ATC facility should squawk 1202 in lieu of 1200. Gliders operate under some flight and maneuvering limitations. They may go from essentially stationary targets while climbing and thermaling to moving targets very quickly. They can be expected to make radical changes in flight direction to find lift and cannot hold altitude in a response to an ATC request. Gliders may congregate together for short periods of time to climb together in thermals and may cruise together in loose formations while traveling between thermals.*

REFERENCE–
FAA Order 7110.66, National Beacon Code Allocation Plan.

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

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 ARTS/STARS data on the BRITE/DBRITE/TDW.

REFERENCE–
FAA Order JO 7210.3, Para 11–2–4, Use of Modify and Quick Look Functions.
FAA Order JO 7210.3, Para 11–8–4, 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 point-out only) (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 5–2–18, 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

The transferring controller must:

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

REFERENCE–
FAA Order JO 7110.65, Para 2–1–14, Coordinate Use of Airspace.
FAA Order JO 7110.65, Para 2–1–15, Control Transfer.
FAA Order JO 7110.65, Para 5–4–6, Receiving Controller Handoff.

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, unless otherwise specified by a LOA or a facility directive.

c. Ensure that, prior to transferring communications:

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

2. Coordination has been accomplished with all controllers through whose area of jurisdiction the aircraft will pass prior to entering the receiving

Section 5. Radar Separation

5–5–1. APPLICATION

a. Radar separation must be applied to all RNAV aircraft operating at and below FL450 on Q routes or random RNAV routes, excluding oceanic airspace.

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

REFERENCE–
FAA Order JO 7110.5, Para 2-3-8, Aircraft Equipment Suffixes.
FAA Order JO 7110.5, TBL 2-3-10, Aircraft Equipment Suffixes
FAA Order JO 7110.65, Para 4–4–1, Route Use.
AIM, Para 5-1-8d., Area Navigation (RNAV).
AIM, Para 5-3-4a.3. Area Navigation (RNAV) Routes.
P/CG Term - Global Navigation Satellite System (GNSS)[ICAO].
P/CG Term - Global Positioning Satellite/ Wide Area Augmentation Minimum En Route IFR Altitude (GPS/WAAS MEA).
P/CG Term – Parallel Offset Route.
AC 90-101A, U.S. Terminal and En Route Area Navigation (RNAV) Operations, Para 8a, Navigation System Accuracy.

b. Radar separation may be applied between:

1. Radar identified aircraft.

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

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

(a) The performance of the radar system is adequate and, as a minimum, primary radar targets or ASR–9/Full Digital Radar Primary Symbol targets are being displayed on the display being used within the airspace within which radar separation is being applied; and

(b) Flight data on the aircraft not radar-identified indicate it is a type which can be expected to give adequate primary/ASR–9/Full Digital Radar Primary Symbol return in the area where separation is applied; and

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

(1) When less than 40 miles from the antenna– *6 miles;*

(2) When 40 miles or more from the antenna– *10 miles*;

(3) Narrowband radar operations– *10 miles;* and

(d) Radar separation is maintained between the radar-identified aircraft and all observed primary, ASR–9/Full Digital Radar Primary Symbol, and secondary radar targets until nonradar separation is established from the aircraft not radar identified; and

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

REFERENCE–
FAA Order JO 7110.65, Para 4–1–2, Exceptions.
FAA Order JO 7110.65, Para 4–4–1, Route Use.
FAA Order JO 7110.65, Para 5–3–1, Application.
FAA Order JO 7110.65, Para 5–5–8, Additional Separation for Formation Flights.
FAA Order JO 7110.65, Para 5–9–5, Approach Separation Responsibility.

4. A radar-identified aircraft and one not radar-identified that is in transit from oceanic airspace or non-radar offshore airspace into an area of known radar coverage where radar separation is applied as specified in Paragraph 8–5–5, Radar Identification Application, until the transiting aircraft is radar-identified or the controller establishes other approved separation in the event of a delay or inability to establish radar identification of the transiting aircraft.

REFERENCE–
FAA Order JO 7110.65, Para 2–2–6, IFR Flight Progress Data.
FAA Order JO 7110.65, Para 5–1–1, Presentation and Equipment Performance.
FAA Order JO 7110.65, Para 5–3–1, Application.
FAA Order JO 7110.65, Para 8–1–8, Use of Control Estimates.
FAA Order JO 7110.65, Para 8–5–5, Radar Separation.

5–5–2. TARGET SEPARATION

Apply radar separation:

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

b. Between the ends of beacon control slashes.

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

d. All–digital displays. Between the centers of digital targets; do not allow digital targets to touch. ■

REFERENCE–
FAA Order JO 7110.65, Para 5–9–7, Simultaneous Independent Approaches– Dual & Triple.

5–5–3. TARGET RESOLUTION

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

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

NOTE–
This procedure must not be provided utilizing mosaic radar systems.

c. Target resolution must be applied as follows:

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

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

3. Between the ends of two beacon control slashes.

5–5–4. MINIMA

Separate aircraft by the following minima:

a. *TERMINAL*. Single Sensor ASR or Digital Terminal Automation System (DTAS):

NOTE–
Includes single sensor long range radar mode.

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*.

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

b. *TERMINAL*. FUSION:

1. Fusion target symbol – *3 miles.*

2. When displaying ISR in the data block- *5 miles.*

NOTE–
In the event of an unexpected ISR on one or more aircraft, the ATCS working that aircraft must transition from 3-mile to 5-mile separation, or establish some other form of approved separation (visual or vertical) as soon as feasible. This action must be timely, but taken in a reasonable fashion, using the controller's best judgment, as not to reduce safety or the integrity of the traffic situation. For example, if ISR appears when an aircraft is established on final with another aircraft on short final, it would be beneficial from a safety perspective to allow the trailing aircraft to continue the approach and land rather than terminate a stabilized approach.

3. If TRK appears in the data block, handle in accordance with Paragraph 5–3–7, Identification Status, subparagraph b, and take appropriate steps to establish non-radar separation.

4. ADS-B may be integrated as an additional surveillance source when operating in FUSION mode. The display of ADS-B targets is permitted and does not require radar reinforcement.

NOTE–
ADS-B surveillance must only be used when operating in FUSION.

5. The use of ADS-B only information may be used to support all radar requirements associated with any published instrument procedure that is annotated "Radar Required".

6. The ADS-B Computer Human Interface (CHI) may be implemented by facilities on a sector by sector or facility wide basis when the determination is made that utilization of the ADS-B CHI provides an operational advantage to the controller.

c. EBUS, Terminal Mosaic/Multi-Sensor Mode

NOTE–
Mosaic/Multi–Sensor Mode combines radar input from 2 to 16 sites into a single picture utilizing a mosaic grid composed of radar sort boxes.

1. Below FL 600– *5 miles.*

2. At or above FL 600– *10 miles.*

3. Facility directives may specify 3 miles for areas meeting all of the following conditions:

(a) Radar site adaptation is set to single sensor.

(b) Significant operational advantages can be obtained.

(c) Within 40 miles of the antenna.

(d) Up to and including FL 230.

(e) Facility directives specifically define the area where the separation can be applied and define the requirements for displaying the area on the controller's display.

REFERENCE–
FAA Order JO 7210.3, Para 8-2-1, Three Mile Airspace Operations

4. When transitioning from terminal to en route control, 3 miles increasing to 5 miles or greater, provided:

(a) The aircraft are on diverging routes/courses, and/or

(b) The leading aircraft is and will remain faster than the following aircraft; and

(c) Separation constantly increasing and the first center controller will establish 5 NM or other appropriate form of separation prior to the aircraft departing the first center sector; and

(d) The procedure is covered by a letter of agreement between the facilities involved and limited to specified routes and/or sectors/positions.

d. ERAM:

1. Below FL 600- *5 miles.*

2. At or above FL 600- *10 miles*

3. Up to and including FL 230 where all the following conditions are met – *3 miles:*

(a) Significant operational advantages can be obtained.

(b) Within 40 NM of the preferred sensor or within 60 NM of the preferred sensor when using ASR–9 with Mode S or ASR–11 MSSR Beacon and within the 3 NM separation area.

(c) The preferred sensor is providing reliable beacon targets.

(d) Facility directives specifically define the 3 NM separation area.

(e) The 3 NM separation area is displayable on the video map.

(f) Involved aircraft are displayed using the 3 NM target symbol.

4. When transitioning from terminal to en route control, 3 miles increasing to 5 miles or greater, provided:

(a) The aircraft are on diverging routes/courses, and/or

(b) The leading aircraft is and will remain faster than the following aircraft; and

(c) Separation constantly increasing and the first center controller will establish 5 NM or other appropriate form of separation prior to the aircraft departing the first center sector; and

(d) The procedure is covered by a letter of agreement between the facilities involved and limited to specified routes and/or sectors/positions.

REFERENCE–
FAA Order JO 7210.3, Para 8-2-1, Three Mile Airspace Operations

e. MEARTS Mosaic Mode:

1. Below FL 600- *5 miles.*

2. At or above FL 600- *10 miles.*

3. For areas meeting all of the following conditions – *3 miles*:

(a) Radar site adaptation is set to single sensor mode.

NOTE–
1. *Single Sensor Mode displays information from the radar input of a single site.*

2. *Procedures to convert MEARTS Mosaic Mode to MEARTS Single Sensor Mode at each PVD/MDM will be established by facility directive.*

(b) Significant operational advantages can be obtained.

(c) Within 40 NM of the sensor or within 60 NM of the sensor when using ASR–9 with Mode S or ASR–11 MSSR Beacon and within the 3 NM separation area.

(d) Up to and including FL230.

(e) Facility directives specifically define the area where the separation can be applied and define the requirements for displaying the area on the controller's PVD/MDM.

4. MEARTS Mosaic Mode Utilizing Single Source Polygon (San Juan CERAP and Honolulu Control Facility only) when meeting all of the following conditions– *3 miles*:

(a) Up to and including FL230 within 40 miles from the antenna or within 60 NM when using ASR–9 with Mode S or ASR–11 MSSR Beacon and targets are from the adapted sensor.

(b) The single source polygon must be displayed on the controller's PVD/MDM.

(c) Significant operational advantages can be obtained.

(d) Facility directives specifically define the single source polygon area where the separation can be applied and specify procedures to be used.

(e) Controller must commence a transition to achieve either vertical separation or 5 mile lateral separation in the event that either target is not from the adapted sensor.

f. STARS Multi−Sensor Mode:

NOTE−
1. *In Multi−Sensor Mode, STARS displays targets as filled and unfilled boxes, depending upon the target's distance from the radar site providing the data. Since there is presently no way to identify which specific site is providing data for any given target, utilize separation standards for targets 40 or more miles from the antenna.*

2. *When operating in STARS Single Sensor Mode, if TRK appears in the data block, handle in accordance with para 5−3−7, Identification Status, subpara b, and take appropriate steps to establish nonradar separation.*

3. *TRK appears in the data block whenever the aircraft is being tracked by a radar site other than the radar currently selected. Current equipment limitations preclude a target from being displayed in the single sensor mode; however, a position symbol and data block, including altitude information, will still be displayed. Therefore, low altitude alerts must be provided in accordance with para 2−1−6 , Safety Alert.*

WAKE TURBULENCE APPLICATION

g. Separate aircraft operating directly behind or following an aircraft conducting an instrument approach by the minima specified and in accordance with the following:

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

1. When operating within 2,500 feet of the flight path of the leading aircraft over the surface of the earth and less than 1,000 feet below:

(a) *TERMINAL.* Behind super:

(1) Heavy - *6 miles.*

(2) Large - *7 miles.*

(3) Small - *8 miles.*

(b) *EN ROUTE.* Behind super - *5 miles,* unless the super is operating at or below FL240 and below 250 knots, then:

(1) Heavy - *6 miles.*

(2) Large - *7 miles.*

(3) Small - *8 miles.*

(c) Behind heavy:

(1) Heavy - *4 miles.*

(2) Large or small - *5 miles.*

2. Separate small aircraft behind a B757 by *4 miles* when operating within 2,500 feet of the flight path of the leading aircraft over the surface of the earth and/or less than 500 feet below.

3. *TERMINAL.* When departing parallel runways separated by less than 2,500 feet, the 2,500 feet requirement in subparagraph 2 is not required when a small departs the parallel runway behind a B757. Issue a wake turbulence cautionary advisory and instructions that will establish lateral separation in accordance with subparagraph 2. Do not issue instructions that will allow the small to pass behind the B757.

NOTE−
1. *The application of Paragraph 5−8−3, Successive or Simultaneous Departures, satisfies this requirement.*

2. *Consider runways separated by less than 700 feet as a single runway because of the possible effects of wake turbulence.*

WAKE TURBULENCE APPLICATION

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

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 single sensor slant range mode and 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 10–4–11 , Reduced Separation on Final.

5–5–5. VERTICAL APPLICATION

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

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

REFERENCE–
FAA Order JO 7110.65, Para 4–5–1 , Vertical Separation Minima.
FAA Order JO 7110.65, Para 5–2–18 , Validation of Mode C Readout.
FAA Order JO 7110.65, Para 7–7–3 , Separation.
FAA Order JO 7110.65, Para 7–8–3 , Separation.
FAA Order JO 7110.65, Para 7–9–4 , Separation.

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

NOTE–
1. *Consider known aircraft performance characteristics, pilot furnished and/or Mode C detected information which indicate that climb/descent will not be consistent with the rates recommended in the AIM.*

2. *It is possible that the separation minima described in Paragraph 4–5–1 , Vertical Separation Minima, Paragraph 7–7–3 , Separation, Paragraph 7–8–3 , Separation, or Paragraph 7–9–4 , Separation, might not always be maintained using subpara b. However, correct application of this procedure will ensure that aircraft are safely separated because the first aircraft must have already vacated the altitude prior to the assignment of that altitude to the second aircraft.*

REFERENCE–
FAA Order JO 7110.65, Para 2–1–3 , Procedural Preference.
FAA Order JO 7110.65, Para 4–5–1 , Vertical Separation Minima.
FAA Order JO 7110.65, Para 5–2–18 , Validation of Mode C Readout.
FAA Order JO 7110.65, Para 6–6–1 , Application.

5–5–6. EXCEPTIONS

a. Do not use Mode C to effect vertical separation with an aircraft on a cruise clearance, contact approach, or as specified in Paragraph 5–15–4, System Requirements, subpara f3.

REFERENCE–
FAA Order JO 7110.65, Para 6–6–2 , Exceptions.
FAA Order JO 7110.65, Para 7–4–6 , Contact Approach.
P/CG Term– Cruise.

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

1. Severe turbulence is reported.

2. Aircraft are conducting military aerial refueling.

REFERENCE–
FAA Order JO 7110.65, Para 9–2–14 , Military Aerial Refueling.

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

5–5–7. PASSING OR DIVERGING

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

1. Single Site ASR or FUSION Mode

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

NOTE–
Two aircraft, both assigned 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 radar vectors with an angular difference of at least 45 degrees, is considered a correct application of this paragraph.

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

3. Although approved separation may be discontinued, the requirements of Paragraph 5–5–4, Minima, subpara g must be applied when wake turbulence separation is required.

REFERENCE–
FAA Order JO 7110.65, Para 1–2–2 , Course Definitions.

NOTE–
Apply en route separation rules when using multi–sensor mode.

b. *EN ROUTE.* Vertical separation between aircraft may be discontinued when they are on opposite courses as defined in Paragraph 1–2–2, Course Definitions; and

1. You are in communications with both aircraft involved; and

2. You tell the pilot of one aircraft about the other aircraft, including position, direction, type; and

3. One pilot reports having seen the other aircraft and that the aircraft have passed each other; and

4. You have observed that the radar targets have passed each other; and

5. You have advised the pilots if either aircraft is classified as a super or heavy aircraft.

6. Although vertical separation may be discontinued, the requirements of Paragraph 5–5–4, Minima, subpara g must be applied when wake turbulence separation is required.

EXAMPLE–
"Traffic, twelve o'clock, Boeing Seven Twenty Seven, opposite direction. Do you have it in sight?"

(If the answer is in the affirmative):

"Report passing the traffic."

(When pilot reports passing the traffic and the radar targets confirm that the traffic has passed, issue appropriate control instructions.)

5–5–8. ADDITIONAL SEPARATION FOR FORMATION FLIGHTS

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

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

REFERENCE–
FAA Order JO 7110.65, Para 2–1–13 , Formation Flights.
FAA Order JO 7110.65, Para 5–5–1 , Application.
FAA Order JO 7110.65, Para 7–7–3 , Separation.
P/CG Term– Formation Flight.

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

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 9–2–14 , 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 subparas 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 3–7–4, 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, 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 11, 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 when:

1. The vector or approved deviation is off an assigned procedure which contains altitude instructions, 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 restrictions, i.e., SID, STAR, and a clearance to Climb Via/Descend Via has been issued.

d. When vectoring or approving an aircraft to deviate off of a procedure that includes published altitude restrictions, advise the pilot if you intend on clearing the aircraft to resume the procedure.

PHRASEOLOGY–
FLY HEADING (degrees), MAINTAIN (altitude), EXPECT TO RESUME (SID, STAR, etc.).

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

NOTE–
After a Climb Via or Descend Via clearance has been issued, a vector/deviation off of a SID/STAR cancels the altitude restrictions on the procedure. The aircraft's Flight Management System (FMS) may be unable to process crossing altitude restrictions once the aircraft leaves the SID/STAR lateral path. Without an assigned altitude, the aircraft's FMS may revert to leveling off at the altitude set by the pilot, which may be the SID/STAR's published top or bottom altitude.

e. Provide radar navigational guidance until the aircraft is:

1. Established within the airspace to be protected for the nonradar route to be flown, or

2. On a heading that will, within a reasonable distance, intercept the nonradar route to be flown, and

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

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

or

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

or
RESUME (SID/STAR/transition/procedure).

REFERENCE–
FAA Order JO 7110.65, Chapter 4, Section 1, NAVAID Use Limitations.
FAA Order JO 7110.65,Paragraph 4-5-7, Altitude Information

f. Aircraft instructed to resume a procedure which contains published crossing restrictions (SID/STAR) must be issued/reissued all applicable restrictions or be instructed to Climb Via/Descend Via.

PHRASEOLOGY–
CLEARED DIRECT (NAVAID, fix, waypoint) CROSS (NAVAID, fix, waypoint) AT/AT OR ABOVE/AT OR BELOW (altitude), then CLIMB VIA/DESCEND VIA (SID/STAR)

EXAMPLE–
"Cleared direct Luxor, then descend via the Ksino One arrival."
"Cleared direct HITME, cross HITME at or above one one thousand, then climb via the Boach Five departure."

g. Aircraft may not be vectored off an Obstacle Departure Procedure (ODP), or issued an altitude lower than published altitude on an ODP, until at or above the MVA/MIA, at which time the ODP is cancelled.

NOTE–
Once an aircraft has been vectored off an Obstacle Departure Procedure, the procedure is cancelled and ATC cannot clear the aircraft to resume the ODP.

REFERENCE–
P/CG– Obstacle Departure Procedure

h. Aircraft vectored off an RNAV route must be recleared to the next waypoint or as requested by the pilot.

i. When flight data processing is available, update the route of flight in the computer unless an operational advantage is gained and coordination is accomplished.

j. Inform the pilot when a vector will take the aircraft across a previously assigned nonradar route.

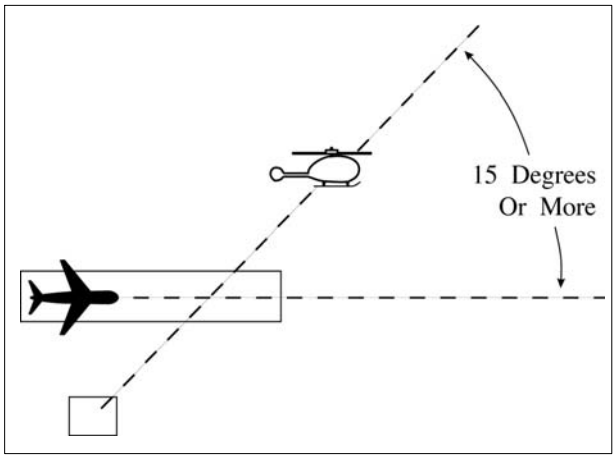
PHRASEOLOGY–
EXPECT VECTOR ACROSS (NAVAID radial) (airway/route/course) FOR (purpose).

REFERENCE–
FAA Order JO 7110.65, Para 7–6–1, Application.

5–6–3. VECTORS BELOW MINIMUM ALTITUDE

a. Except in en route automated environments in areas where more than 3 miles separation minima is required, you may vector a departing IFR aircraft, or one executing a missed approach, within 40 miles of

FIG 5–8–6
Intersecting Helicopter Course Departures



c. Between aircraft departing in the same direction from parallel runways/helicopter takeoff courses. Authorize simultaneous takeoffs if the centerlines/takeoff courses are separated by at least 2,500 feet and courses diverge by 15 degrees or more immediately after departure or 10 degrees or more when both aircraft are flying an RNAV SID. (See FIG 5–8–7 and FIG 5–8–8.)

NOTE–
RNAV SIDs specific to this paragraph are those SIDs constructed with a specific lateral path that begins at the DER.

FIG 5–8–7
Parallel Runway Departures

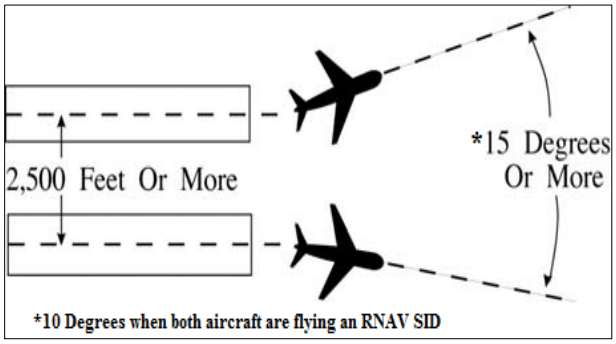
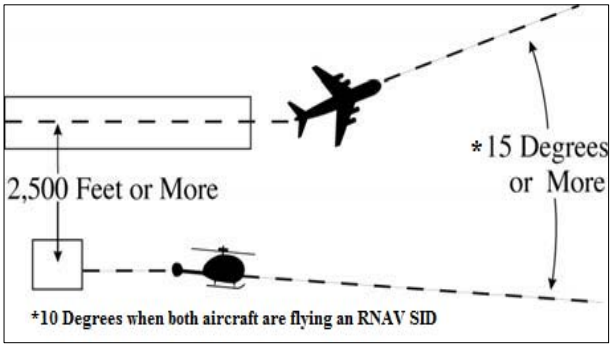


FIG 5–8–8
Parallel Helicopter Course Departures



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

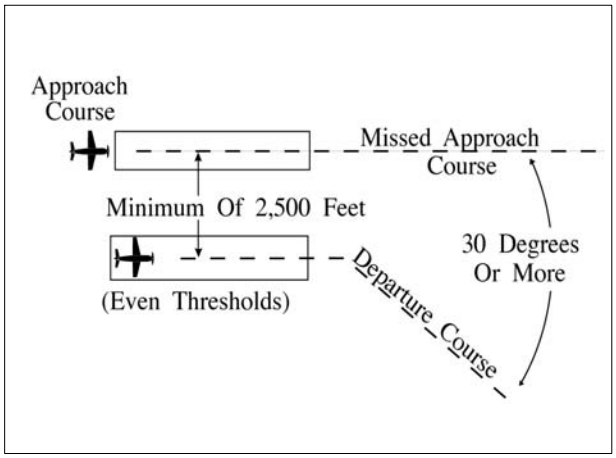
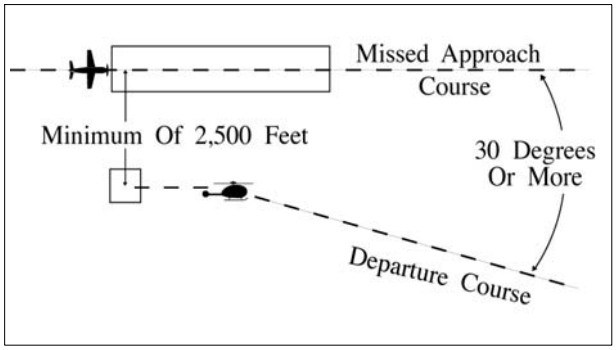


FIG 5−8−10
Parallel Thresholds are Even



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

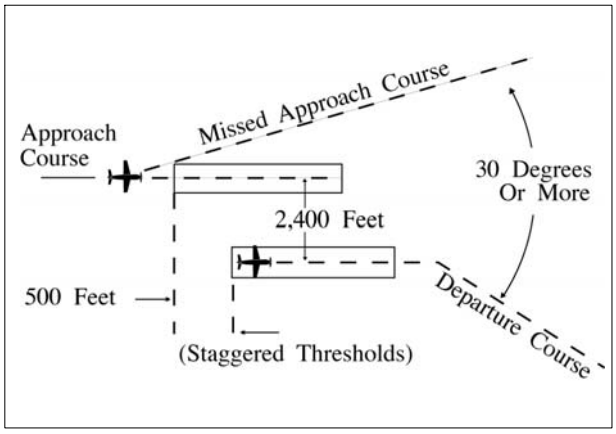
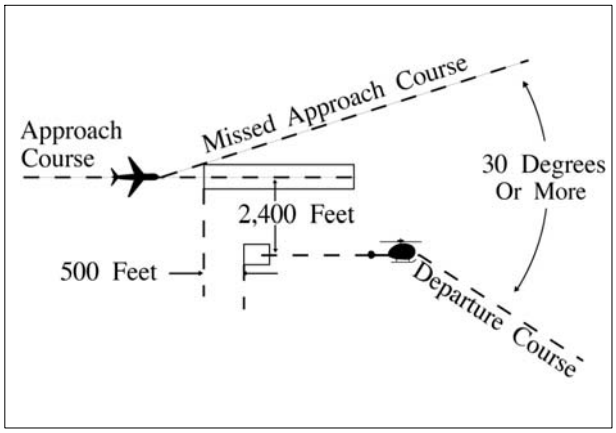


FIG 5−8−12
Parallel Thresholds are Staggered



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.)

REFERENCE–
FAA Order JO 7110.65, Para 2–1–19, Wake Turbulence.
FAA Order JO 7110.65, Section 5, Radar Separation, Para 5–5–1, Application.
FAA Order JO 7110.65, Para 7–2–1, Visual Separation.
FAA Order JO 7110.65, Para 5–5–4, Minima.
FAA Order JO 7210.3, Para 2–1–15, Authorization for Separation Services by Towers.

b. When timed approaches are being conducted, the radar controller must maintain the radar separation specified in Paragraph 6–7–5, Interval Minima, until the aircraft is observed to have passed the final approach fix inbound (nonprecision approaches) or the OM or the fix used in lieu of the outer marker (precision approaches) and is within 5 miles of the runway on the final approach course or until visual separation can be provided by the tower.

REFERENCE–
FAA Order JO 7110.65, Para 5–4–6, Receiving Controller Handoff.
FAA Order JO 7110.65, Para 5–9–2, Final Approach Course Interception.
FAA Order JO 7110.65, Para 5–9–6, Parallel Dependent Approaches.
FAA Order JO 7110.65, Para 6–7–2, Approach Sequence.

5–9–6. SIMULTANEOUS DEPENDENT APPROACHES

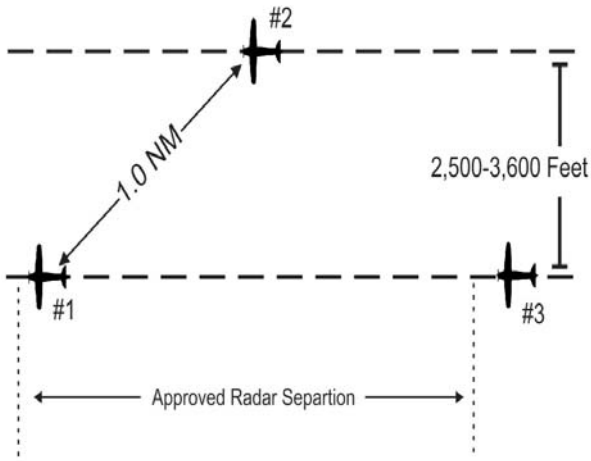
TERMINAL

a. Apply the following minimum separation when conducting simultaneous dependent approaches:

1. Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft during turn on.

2. Provide a minimum of 1 mile radar separation diagonally between successive aircraft on adjacent final approach courses when runway centerlines are at least 2,500 feet but no more than 3,600 feet apart.

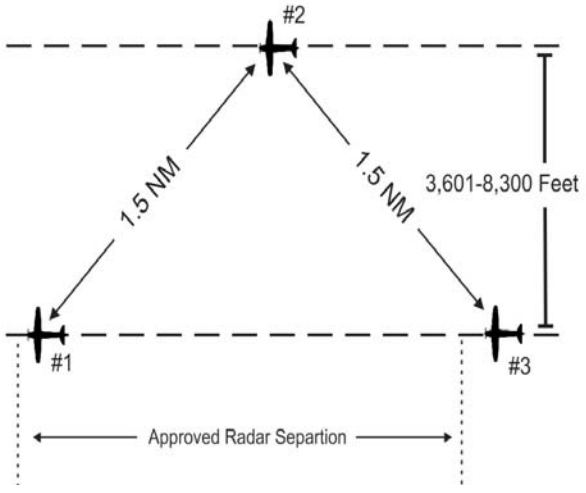
FIG 5–9–4
Simultaneous Dependent Approaches



EXAMPLE–
In FIG 5–9–4, Aircraft 2 is 1.0 mile from Aircraft 1. Approved radar separation must be maintained between Aircraft 1 and Aircraft 3.

3. Provide a minimum of 1.5 miles radar separation diagonally between successive aircraft on adjacent final approach courses when runway centerlines are more than 3,600 feet but no more than 8,300 feet apart.

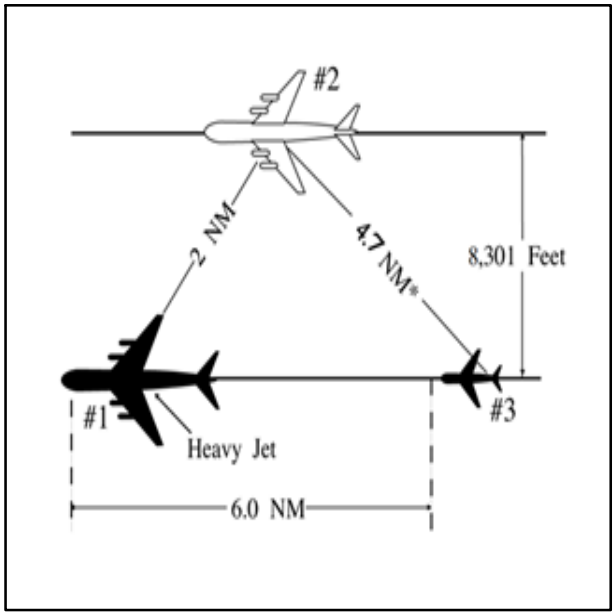
FIG 5–9–5
Simultaneous Dependent Approaches



EXAMPLE–
In FIG 5–9–5, Aircraft 2 is 1.5 miles from Aircraft 1, and Aircraft 3 is 1.5 miles or more from Aircraft 2. Approved radar separation must be maintained between aircraft on the same final.

4. Provide a minimum of 2 miles radar separation diagonally between successive aircraft on adjacent final approach courses where runway centerlines are more than 8,300 feet but no more than 9,000 feet apart.

FIG 5–9–6
Simultaneous Dependent Approaches



EXAMPLE–
*In FIG 5–9–6, Aircraft 2 is 2 miles from heavy Aircraft 1. Aircraft 3 is a small aircraft and is 6 miles from Aircraft 1. *The resultant separation between Aircraft 2 and 3 is at least 4.7 miles.*

5. Provide the minimum approved radar separation between aircraft on the same final approach course.

REFERENCE–
FAA Order JO 7110.65, Section 5, Radar Separation, Para 5–5–4 , Minima.

b. The following conditions are required when applying the minimum radar separation on adjacent final approach courses allowed in subparagraph a:

NOTE–
1. *Simultaneous dependent approaches involving an RNAV approach may only be conducted when (GPS) appears in the approach title or a chart note states that GPS is required.*

2. *Simultaneous dependent approaches may only be conducted where instrument approach charts specifically authorize simultaneous approaches to adjacent runways.*

1. Apply this separation standard only after aircraft are established on the parallel final approach course.

2. Straight-in landings will be made.

3. Missed approach procedures do not conflict.

4. Aircraft are informed that approaches to both runways are in use. This information may be provided through the ATIS.

5. Approach control must have the interphone capability of communicating directly with the local controller at locations where separation responsibility has not been delegated to the tower.

NOTE–
The interphone capability is an integral part of this procedure when approach control has the sole separation responsibility.

REFERENCE–
FAA Order JO 7110.65, Para 5–9–5 , Approach Separation Responsibility.
FAA Order JO 7210.3, Para 2–1–15, Authorization for Separation Services by Towers.

c. Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight, such as surface wind direction and velocity, wind shear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of approach in use.

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

5–9–7. SIMULTANEOUS INDEPENDENT APPROACHES– DUAL & TRIPLE

TERMINAL

a. Apply the following minimum separation when conducting simultaneous independent approaches:

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) until aircraft are established on a published segment of an approach authorized for Established on RNP (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 10–4–6, Simultaneous Independent Approaches
P/CG Term – Required Navigation Performance (RNP)
P/CG Term – Established on RNP Concept

2. Dual parallel runway centerlines are at least 3,600 feet apart, or dual parallel runway centerlines are at least 3,000 feet apart with a 2.5° to 3.0° offset approach to either runway and the airport field elevation is 2,000 feet MSL or less.

NOTE–
Airport field elevation requirement does not apply to dual parallel runways that are 4,300 feet or more apart.

3. Triple parallel approaches may be conducted under one of the following conditions:

(a) Parallel runway centerlines are at least 3,900 feet apart and the airport field elevation is 2,000 feet MSL or less; or

(b) Parallel runway centerlines are at least 3,000 feet apart, a 2.5° to 3.0° offset approach to both outside runways, and the airport field elevation is 2,000 feet MSL or less; or

(c) Parallel runway centerlines are at least 3,000 feet apart, a single 2.5° to 3.0° offset approach to either outside runway while parallel approaches to the remaining two runways are separated by at least 3,900 feet, and the airport field elevation is 2,000 feet MSL or less.

(d) Parallel approaches to airports where the airport field elevation is more than 2,000 feet MSL require the use of the final monitor aid (FMA) system and an approved FAA aeronautical study.

4. Provide the minimum applicable radar separation between aircraft on the same final approach course.

NOTE–
Except when conducting an EoR operation, no two aircraft will be assigned the same altitude during turn–on to final. All three aircraft will be assigned altitudes which differ by a minimum of 1,000 feet. Example: 3,000, 4,000, 5,000; 7,000, 8,000, 9,000.

b. A color digital display set to a 4 to 1 (4:1) aspect ratio (AR) with visual and aural alerts, such as the STARS final monitor aid (FMA), and a surveillance update rate at least 4.8 seconds must be used to monitor approaches where:

1. Dual parallel runway centerlines are at least 3,000 and less than 4,300 feet apart.

2. Triple parallel runway centerlines are at least 3,000 but less than 5,000 feet apart and the airport field elevation is 2,000 feet MSL or less.

3. Triple parallel approaches to airports where the airport field elevation is more than 2,000 feet MSL require use of the FMA system and an approved FAA aeronautical study.

NOTE–
FMA is not required to monitor the NTZ for runway centerlines 4,300 feet or greater for dual runways, and 5,000 feet or greater for triple operations.

c. The following conditions must be met when conducting dual or triple simultaneous independent approaches:

NOTE–
Simultaneous independent approaches may only be conducted where instrument approach charts specifically authorize simultaneous approaches.

REFERENCE–
FAA Order JO 7210.3, Para 10-4-6, Simultaneous Approaches (Dependent/Independent)

1. Straight-in landings will be made.

2. All appropriate communication, navigation, and surveillance systems are operating normally.

3. Inform aircraft that simultaneous independent approaches are in use, or when runway centerlines are less than 4,300 feet PRM approaches are in use, prior to aircraft departing an outer fix. This information may be provided through the ATIS.

REFERENCE–
P/CG Term– Precision Runway Monitor (PRM) System.

4. Clear the aircraft to descend to the appropriate glideslope/glidepath intercept altitude soon enough to provide a period of level flight to dissipate excess speed. Provide at least 1 mile of straight flight prior to the final approach course intercept.

NOTE–
Not applicable to approaches with RF legs.

5. An NTZ at least 2,000 feet wide is established an equal distance between extended runway final approach courses and must be depicted on the monitor display. The primary responsibility for

navigation on the final approach course rests with the pilot. Control instructions and information are issued only to ensure separation between aircraft and to prevent aircraft from penetrating the NTZ.

6. Monitor all approaches regardless of weather. Monitor local control frequency to receive any aircraft transmission. Issue control instructions as necessary to ensure aircraft do not enter the NTZ.

NOTE–
1. *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 responsibility for providing the minimum applicable longitudinal separation between aircraft on the same final approach course.*

2. *The aircraft is considered the center of the primary radar return for that aircraft, or, if an FMA or other color final monitor aid is used, the center of the digitized target of that aircraft, for the purposes of ensuring an aircraft does not penetrate the NTZ. The provisions ofPparagraph 5–5–2, Target Separation, apply also.*

7. Communications transfer to the tower controller's frequency must be completed prior to losing 1,000 feet vertical or 3 miles radar separation between aircraft.

d. The following procedures must be used by the final monitor controllers:

1. Instruct the aircraft to return to the correct final approach course when aircraft are observed to overshoot the turn-on or to continue on a track which will penetrate the NTZ.

PHRASEOLOGY–
YOU HAVE CROSSED THE FINAL APPROACH COURSE. TURN (left/right) IMMEDIATELY AND RETURN TO THE FINAL APPROACH COURSE,
or
TURN (left/right) AND RETURN TO THE FINAL APPROACH COURSE.

2. 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.

PHRASEOLOGY–
TRAFFIC ALERT, (call sign), TURN (right/left) IMMEDIATELY HEADING (degrees), CLIMB AND MAINTAIN (altitude).

3. 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.

4. Do not inform the aircraft when radar monitoring is terminated.

5. Do not apply the provisions of Paragraph 5–13–1, Monitor on PAR Equipment, for simultaneous independent approaches.

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 independent approaches are being conducted to parallel runways. Factors include, but are not limited to, wind direction/velocity, windshear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of approach in use.

REFERENCE–
FAA Order JO 7110.65, Para 5–1–13 , Radar Service Termination.
FAA Order JO 7110.65, Para 5–9–2 , Final Approach Course Interception.

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

TERMINAL

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

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.

c. Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft during turn-on to parallel or offset final approach.

NOTE–
Communications transfer to the tower controller's frequency must be completed prior to losing vertical separation between aircraft.

d. Provide the minimum applicable radar separation between aircraft on the same final approach course.

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

e. The following conditions must be met when conducting dual and triple PRM approaches:

1. Straight-in landings will be made.

2. All appropriate communication, navigation, and surveillance systems are operating normally.

3. Inform aircraft that PRM approaches are in use prior to aircraft departing an outer fix. This information may be provided through the ATIS.

4. Clear the aircraft to descend to the appropriate glideslope/glidepath intercept altitude soon enough to provide a period of level flight to dissipate excess speed. Provide at least 1 mile of straight flight prior to the final approach course intercept.

NOTE–
Not applicable to approaches with RF legs.

5. An NTZ at least 2,000 feet wide is established an equal distance between extended runway final approach courses and must be depicted on the monitor display. The primary responsibility for navigation on the final approach course rests with the pilot. Control instructions and information are issued only to ensure separation between aircraft and to prevent aircraft from penetrating the NTZ.

6. Monitor all approaches regardless of weather. Monitor local control frequency to receive any aircraft transmission. Issue control instructions as necessary to ensure aircraft do not enter the NTZ.

7. Separate monitor controllers, each with transmit/receive and override capability on the local control frequency, must ensure aircraft do not penetrate the depicted NTZ. Facility directives must define the responsibility for providing the minimum applicable longitudinal separation between aircraft on the same final approach course.

NOTE–
The aircraft is considered the center of the digitized target for the purposes of ensuring an aircraft does not penetrate the NTZ.

f. The following procedures must be used by the final monitor controllers:

1. Provide position information to an aircraft that is (left/right) of the depicted final approach course centerline, and in your judgment is continuing on a track that may penetrate the NTZ.

PHRASEOLOGY–
(Aircraft call sign) I SHOW YOU (left/right) OF THE FINAL APPROACH COURSE.

2. Instruct the aircraft to return immediately to the correct final approach course when aircraft are observed to overshoot the turn-on or continue on a track which will penetrate the NTZ.

PHRASEOLOGY–
YOU HAVE CROSSED THE FINAL APPROACH COURSE. TURN (left/right) IMMEDIATELY AND RETURN TO THE FINAL APPROACH COURSE.
or
TURN (left/right) AND RETURN TO THE FINAL APPROACH COURSE.

3. Instruct aircraft on the adjacent final approach course to alter course to avoid the deviating aircraft when an aircraft is observed penetrating or in your judgment will penetrate the NTZ.

NOTE–
An instruction that may include a descent to avoid the deviating aircraft should only be used when there is no other reasonable option available to the controller. In such a case, the descent must not put the aircraft below the MVA.

PHRASEOLOGY–
TRAFFIC ALERT, (call sign), TURN (left/right) IMMEDIATELY HEADING (DEGREES), CLIMB AND MAINTAIN (altitude).

4. Terminate radar monitoring when one of the following occurs:

(a) Visual separation is applied.

(b) The aircraft reports the approach lights or runway in sight.

(c) The aircraft is 1 mile or less from the runway threshold, if procedurally required, and contained in facility directives.

5. Do not inform the aircraft when radar monitoring is terminated.

6. Do not apply the provisions of Paragraph 5-13-1, Monitor on PAR Equipment, for PRM approaches.

g. Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight when PRM approaches are being conducted to parallel runways. Factors include, but are not limited to, wind direction/velocity, windshear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of the approach in use.

REFERENCE–
FAA Order JO 7110.65, Para 5–1–13 , Radar Service Termination.
FAA Order JO 7110.65, Para 5–9–2 , Final Approach Course Interception.

5–9–9. SIMULTANEOUS OFFSET INSTRUMENT APPROACHES (SOIA)– HIGH UPDATE RADAR

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 less than 3,000 feet with one final approach course offset by 2.5 to 3.0 degrees using a high update rate surveillance system with a 1.0–second radar update; and

1. Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft during turn–on to final approaches.

NOTE–
Communications transfer to the tower controller's frequency must be completed prior to losing vertical separation between aircraft.

2. Provide the minimum applicable radar separation between aircraft on the same final approach course.

3. Provide the minimum applicable radar separation between the trailing offset aircraft of a leading SOIA pair and the lead straight-in aircraft in the subsequent SOIA pair when the parallel runways have centerlines separated by less than 2,500 feet.

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

b. The following conditions are required when applying the minimum separation between lead straight-in and offset trailing approaches with glideslope courses or vertical navigation authorized in subparagraph a above:

1. Straight–in landings will be made.

2. All appropriate communication, navigation, and surveillance systems are operating normally.

3. Inform aircraft that PRM approaches are in use prior to aircraft departing an outer fix. This information may be provided through the ATIS.

4. Clear the aircraft to descend to the appropriate glideslope/glidepath intercept altitude soon enough to provide a period of level flight to dissipate excess speed. Provide at least 1 mile of straight flight prior to the final approach course intercept.

NOTE–
Not applicable to approaches with RF legs.

5. A No Transgression Zone (NTZ) at least 2,000 feet wide is established an equal distance between extended runway final approach courses and must be depicted on the monitor display. The NTZ begins prior to the point where adjacent inbound aircraft first lose vertical separation and extends to a point coincident with the location of the offset approach MAP. The primary responsibility for navigation on the final approach course rests with the pilot. Control instructions and information are issued only to ensure separation between aircraft and to prevent aircraft from penetrating the NTZ.

6. Monitor all approaches regardless of weather. Monitor local control frequency to receive any aircraft transmission. Issue control instructions as necessary to ensure aircraft do not enter the NTZ.

7. Separate monitor controllers, each with transmit/receive and override capability on the local control frequency, must ensure aircraft do not penetrate the depicted NTZ. Facility directives must define the responsibility for providing the minimum applicable longitudinal separation between aircraft on the same final approach course and the minimum applicable longitudinal separation between the trailing offset aircraft of a leading SOIA pair and the lead straight in aircraft in the subsequent SOIA pair when the parallel runways have centerlines separated by less than 2,500 feet.

NOTE–
The aircraft is considered the center of the digitized target for that aircraft for the purposes of ensuring an aircraft does not penetrate the NTZ.

c. The following procedures must be used by the final monitor controllers:

1. Provide position information to an aircraft that is (left/right) of the depicted final approach course centerline, and in your judgment is continuing on a track that may penetrate the NTZ.

PHRASEOLOGY–
(Aircraft call sign) I SHOW YOU (left/right) OF THE FINAL APPROACH COURSE.

2. Instruct the aircraft to return immediately to the correct final approach course when aircraft are observed to overshoot the turn–on or continue on a track which will penetrate the NTZ.

PHRASEOLOGY–
YOU HAVE CROSSED THE FINAL APPROACH COURSE. TURN (left/right) IMMEDIATELY AND RETURN TO FINAL APPROACH COURSE.

or

TURN (left/right) AND RETURN TO THE FINAL APPROACH COURSE.

3. Instruct aircraft on the adjacent final approach course to alter course to avoid the deviating aircraft when an aircraft is observed penetrating or in your judgment will penetrate the NTZ.

NOTE–
An instruction that may include a descent to avoid the deviating aircraft should only be used when there is no other reasonable option available to the controller. In such a case, the descent must not put the aircraft below the MVA.

PHRASEOLOGY–
TRAFFIC ALERT, (call sign), TURN (left/right) IMMEDIATELY HEADING (DEGREES), CLIMB AND MAINTAIN (altitude).

4. Terminate radar monitoring when one of the following occurs:

(a) The lead straight in aircraft passes the end of the NTZ nearest the runway threshold.

(b) The trailing offset aircraft passes the end of the NTZ nearest the runway threshold and has reported the lead straight in aircraft in sight.

(c) The aircraft begins the visual segment of the approach.

5. Do not inform the aircraft when radar monitoring is terminated.

6. Do not apply the provisions of Paragraph 5-13-1, Monitor on PAR Equipment, for simultaneous approaches.

d. Advise the pilot of the trailing offset aircraft of traffic on the adjacent lead straight-in approach course, if that traffic will be a factor in the visual segment of the approach. The provisions of Paragraph 7-2-1, Visual Separation, subparagraph a2**,** concerning visual separation between aircraft being provided by the tower must not be applied to aircraft conducting SOIAs.

NOTE–
Once advised, the pilot is authorized to continue past the offset approach MAP if all of the following conditions are met: The pilot has the straight-in approach traffic in sight and expects the traffic to remain in sight; the pilot advises ATC that the traffic is in sight; and the pilot has the runway environment in sight. Otherwise, it is the pilot's responsibility to execute a missed approach at the offset approach MAP.

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 Para 5−5−4, Minima, must be applied unless acceptable mitigating techniques and operational procedures have been documented and verified by an AFS safety assessment and authorized by the Director, Operations-Headquarters, AJT-2. The wake turbulence mitigation techniques employed will be based on each airport's specific runway geometry and meteorological conditions and implemented through local facility directives.

4. Issue all applicable wake turbulence advisories.

REFERENCE−
FAA Order JO 8260.49, Para 13.0, Wake Turbulence Requirements.
FAA Order JO 7210.3, Para 10−4−6, Simultaneous Independent Approaches.
FAA Order JO 7110.65, Para 2−1−20 , Wake Turbulence Cautionary Advisories.
FAA Order JO 7110.65, Para 5−5−4 , Minima.

h. Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight when conducting SOIA to parallel runways. Factors include but are not limited to wind direction/velocity, wind−shear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of the approach in use.

REFERENCE−
FAA Order JO 7110.65, Para 5−1−13 , Radar Service Termination.
FAA Order JO 7110.65, Para 5−9−2 , Final Approach Course Interception.

5−9−10. SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY-SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS

TERMINAL

a. Simultaneous independent approaches to widely-spaced parallel runways may only be conducted where instrument approach charts specifically authorize simultaneous approaches.

b. Apply the following minimum separation when conducting simultaneous independent approaches to runway centerlines that are separated by more than 9,000 feet with a field elevation at or below 5,000 feet MSL, or 9,200 feet between runway centerlines with a field elevation above 5,000 feet MSL:

1. Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft:

(a) during turn-on to parallel final approach, or

(b) conducting EoR operations, until aircraft are established on a published segment of an approach authorized for EoR operations.

NOTE−
Aircraft are considered EoR on an initial or intermediate segment of an instrument approach authorized for EoR operations after the approach clearance has been issued, read back by the pilot and the aircraft is observed on the published procedure (lateral and vertical path, and within any procedure specified speed restriction), and is conducting a simultaneous independent parallel approach with an authorized simultaneous instrument approach to a parallel runway.

REFERENCE−
FAA Order JO 7210.3, Para 10-4-7, Simultaneous Widely-Spaced Parallel Operations
P/CG Term – Required Navigation Performance (RNP)
P/CG Term – Established on RNP Concept

2. Provide the minimum applicable radar separation between aircraft on the same final approach course.

REFERENCE−
FAA Order JO 7110.65, Para 5-5-4, Minima.

c. The following conditions are required when applying the minimum separation on widely−spaced parallel courses allowed in subpara b:

1. Straight-in landings will be made.

2. The approach system, radar, and appropriate frequencies are operating normally.

3. Inform aircraft that simultaneous approaches are in use prior to aircraft departing an outer fix. This information may be provided through the ATIS.

4. Clear an aircraft to descend to the appropriate glideslope/glidepath intercept altitude soon enough

to provide a period of level flight to dissipate excess speed. Provide at least 1 mile of straight flight prior to the final approach course intercept.

NOTE–
Not applicable to approaches with RF legs.

5. Separate final and local controllers are required for each final. Aircraft on the final must be on the appropriate final controller frequency for that runway.

6. Transfer of communication to the tower controller's frequency must be specified in a facility directive and/or Letter of Agreement.

d. The following procedures must be used by the final approach controllers:

NOTE–
There is no requirement for establishment of a NTZ.

1. Instruct the aircraft to return to the correct final approach course when that aircraft is observed to overshoot the turn-on or continue on a track which deviates from the final approach course in the direction of the adjacent approach course.

PHRASEOLOGY–
YOU HAVE CROSSED THE FINAL APPROACH COURSE. TURN (left/right) IMMEDIATELY AND RETURN TO THE FINAL APPROACH COURSE,
or
TURN (left/right) AND RETURN TO THE FINAL APPROACH COURSE.

2. Instruct aircraft on adjacent final approach course to alter course to avoid the deviating aircraft when an aircraft is observed, or in the controller's judgment, has deviated from the final approach course in the direction of the adjacent approach course.

PHRASEOLOGY–
TRAFFIC ALERT, (call sign), TURN (left/right) IMMEDIATELY HEADING (degrees), CLIMB AND MAINTAIN (altitude)

e. Consideration should be given to known factors that may in any way affect the safety of the instrument approach phase of flight when simultaneous approaches are being conducted to parallel runways. Factors include, but are not limited to, wind direction/velocity, wind-shear alerts/reports, severe weather activity, etc. Closely monitor weather activity that could impact the final approach course. Weather conditions in the vicinity of the final approach course may dictate a change of approach in use.

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

5–9–11. TRANSITIONAL PROCEDURE

When aircraft are conducting simultaneous dependent, independent, or any approaches allowing for reduced separation, and one of the aircraft executes a go-around or has its approach clearance terminated and prior to losing the approved reduced separation, control instructions must be expeditiously issued to increase separation between the applicable aircraft. These control instructions must establish approved separation (for example, altitude and/or lateral separation via divergence). In addition, wake turbulence cautionary advisories must be issued in accordance with Paragraph 2–1–20, Wake Turbulence Cautionary Advisories.

Section 4. Approaches

7–4–1. VISUAL APPROACH

A visual approach is an ATC authorization for an aircraft on an IFR flight plan to proceed visually and clear of clouds to the airport of intended landing. A visual approach is not a standard instrument approach procedure and has no missed approach segment. An aircraft unable to complete a landing from a visual approach must be handled as any go–around and appropriate IFR separation must be provided until the aircraft lands or the pilot cancels their IFR flight plan.

a. At airports with an operating control tower, aircraft executing a go–around may be instructed to enter the traffic pattern for landing and an altitude assignment is not required. The pilot is expected to climb to pattern altitude and is required to maintain terrain and obstruction clearance. ATC must maintain applicable separation from other aircraft.

b. At airports without an operating control tower, aircraft executing a go–around are expected to complete a landing as soon as possible or contact ATC for further clearance. ATC must maintain separation from other IFR aircraft.

REFERENCE–
FAA Order JO 7110.65, Para 2–1–4, Operational Priority.
FAA Order JO 7110.65, Para 2–1–20, Wake Turbulence Cautionary Advisories.
FAA Order JO 7110.65, Para 3–10–2, Forwarding Approach Information by Nonapproach Control Facilities.
FAA Order JO 7110.65, Para 7–2–1, Visual Separation.
FAA Order JO 7110.65, Para 7–4–4, Approaches to Multiple Runways.
FAA Order JO 7210.3, Para 10–3–14, Go–around/Missed Approach.
P/CG Term – Go–around.
AIM, Para 5–4–23, Visual Approach.

7–4–2. VECTORS FOR VISUAL APPROACH

A vector for a visual approach may be initiated if the reported ceiling at the airport of intended landing is at least 500 feet above the MVA/MIA and the visibility is 3 miles or greater. At airports without weather reporting service there must be reasonable assurance (e.g. area weather reports, PIREPs, etc.) that descent and flight to the airport can be made visually, and the pilot must be informed that weather information is not available.

PHRASEOLOGY–
(Ident) FLY HEADING

or

TURN RIGHT/LEFT HEADING (degrees) VECTOR FOR VISUAL APPROACH TO (airport name).

(If appropriate)

WEATHER NOT AVAILABLE.

NOTE–
At airports where weather information is not available, a pilot request for a visual approach indicates that descent and flight to the airport can be made visually and clear of clouds.

REFERENCE–
FAA Order JO 7110.65, Para 5–9–1, Vectors to Final Approach Course.
FAA Order JO 7110.65, Para 7–2–1, Visual Separation.
FAA Order JO 7110.65, Para 7–4–3, Clearance for Visual Approach.
FAA Order JO 7110.65, Para 7–4–4, Approaches to Multiple Runways.
FAA Order JO 7110.65, Para 7–6–7, Sequencing.
FAA Order JO 7110.65, Para 7–7–3, Separation.

7–4–3. CLEARANCE FOR VISUAL APPROACH

ARTCCs and approach controls may clear aircraft for visual approaches using the following procedures:

NOTE–
Towers may exercise this authority when authorized by a LOA with the facility that provides the IFR service, or by a facility directive at collocated facilities.

a. Controllers may initiate, or pilots may request, a visual approach even when an aircraft is being vectored for an instrument approach and the pilot subsequently reports:

1. The airport or the runway in sight at airports with operating control towers.

2. The airport in sight at airports without a control tower.

b. Resolve potential conflicts with all other aircraft, advise an overtaking aircraft of the distance to the preceding aircraft and speed difference, and ensure that weather conditions at the airport are VFR or that the pilot has been informed that weather is not available for the destination airport. Upon pilot request, advise the pilot of the frequency to receive weather information where AWOS/ASOS is available.

PHRASEOLOGY–
(Call sign) (control instructions as required) CLEARED VISUAL APPROACH RUNWAY (number);

or

(Call sign) (control instructions as required) CLEARED VISUAL APPROACH TO (airport name)

(and if appropriate)

WEATHER NOT AVAILABLE

or

VERIFY THAT YOU HAVE THE (airport) WEATHER.

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

c. Clear an aircraft for a visual approach when:

1. The aircraft is number one in the approach sequence, or

2. At locations with an operating control tower, the aircraft is to follow a preceding aircraft and the pilot reports the preceding aircraft in sight and is instructed to follow it, or

NOTE–
The pilot need not report the airport/runway in sight.

3. At locations with an operating control tower, the pilot reports the airport or runway in sight but not the preceding aircraft. Radar separation must be maintained until visual separation is provided.

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

d. All aircraft following a heavy, or a small aircraft following a B757, must be informed of the airplane manufacturer and/or model.

EXAMPLE–
"Cessna Three Four Juliet, following a Boeing 757, 12 o'clock, six miles."

or

"Cessna Three Four Juliet, following a Seven fifty seven, 12 o'clock, six miles."

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

NOTE–
Visual separation is not authorized when the lead aircraft is a super.

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

e. Inform the tower of the aircraft's position prior to communications transfer at controlled airports. ARTS/STARS functions may be used provided a facility directive or LOA specifies control and communication transfer points.

f. In addition to the requirements of Paragraph 7–4–2, Vectors for Visual Approach, and subparas a, b, c, d, and e, ensure that the location of the destination airport is provided when the pilot is asked to report the destination airport in sight.

g. In those instances where airports are located in close proximity, also provide the location of the airport that may cause the confusion.

EXAMPLE–
"Cessna Five Six November, Cleveland Burke Lakefront Airport is at 12 o'clock, 5 miles. Cleveland Hopkins Airport is at 1 o'clock 12 miles. Report Cleveland Hopkins in sight."

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

7–4–4. APPROACHES TO MULTIPLE RUNWAYS

a. All aircraft must be informed that approaches are being conducted to parallel, intersecting, or converging runways. This may be accomplished through use of the ATIS.

b. When conducting visual approaches to multiple runways ensure the following:

1. Do not permit the respective aircrafts' primary radar targets to touch unless visual separation is being applied.

2. When the aircraft flight paths intersect, ensure approved separation is maintained until visual separation is provided.

c. In addition to the requirements in Paragraph 7–2–1, Visual Separation, Paragraph 7–4–1, Visual Approach, Paragraph 7–4–2, Vectors for Visual Approach, and Paragraph 7–4–3, Clearance for Visual Approach, the following conditions apply to visual approaches being conducted simultaneously to parallel, intersecting, and converging runways, as appropriate:

1. Parallel runways separated by less than 2,500 feet. Unless approved separation is provided by ATC, an aircraft must report sighting a preceding aircraft making an approach (instrument or visual) to the adjacent parallel runway. When an aircraft reports another aircraft in sight on the adjacent final approach course and visual separation is applied, controllers

must advise the succeeding aircraft to maintain visual separation. However, do not permit a super or heavy aircraft to overtake another aircraft. Do not permit a B757 or other large aircraft to overtake a small aircraft.

2. Parallel runways separated by at least 2,500 feet, but less than 4,300 feet.

(a) Approved separation is provided until the aircraft are:

(1) Established on a heading or established on a direct course to a fix or cleared on an RNAV/ instrument approach procedure which will intercept the extended centerline of the runway at an angle not greater than 30 degrees, and,

(2) Issued an approach clearance and one pilot has acknowledged receipt of a visual approach clearance, and,

(3) The other pilot has acknowledged receipt of a visual or instrument approach clearance.

NOTE–
1. *The intent of the 30 degree intercept angle is to reduce the potential for overshoots of the extended centerline of the runway and preclude side-by-side operations with one or both aircraft in a "belly-up" configuration during the turn. Aircraft performance, speed, and the number of degrees of the turn are factors to be considered when vectoring aircraft to parallel runways.*

2. *Variances between heading assigned to intercept the extended centerline of the runway and aircraft ground track are expected due to the effect of wind and course corrections after completion of the turn and pilot acknowledgment of a visual approach clearance.*

3. *Procedures using Radius-to-Fix legs that intercept final may be used in lieu of 30-degree intercept provisions contained in this paragraph.*

REFERENCE–
FAA Publication, Pilot's Handbook of Aeronautical Knowledge, Chapter 15 "Effect of Wind."

(b) Visual approaches may be conducted to one runway while visual or instrument approaches are conducted simultaneously to other runways, provided the conditions of subpara (a) are met.

(c) Provided aircraft flight paths do not intersect, and when the provisions of subparas (a) and (b) are met, it is not necessary to apply any other type of separation with aircraft on the adjacent final approach course.

3. Parallel runways separated by 4,300 feet or more.

(a) When aircraft flight paths do not intersect, visual approaches may be conducted simultaneously, provided approved separation is maintained until one of the aircraft has been issued and the pilot has acknowledged receipt of the visual approach clearance.

(b) Visual approaches may be conducted to one runway while visual or instrument approaches are conducted simultaneously to other runways, provided the conditions of subpara (a) are met.

(c) Provided the aircraft flight paths do not intersect, when the provisions of subparas (a) and (b) are met, it is not necessary to apply any other type of separation with aircraft on the adjacent final approach course.

(d) Each aircraft must either be assigned a heading or established on a direct course to a fix or cleared on an RNAV/instrument approach procedure which will allow the aircraft to intercept the extended centerline of the runway at an angle not greater than 30 degrees.

NOTE–
1. *The intent of the 30 degree intercept angle is to reduce the potential for overshoots of the extended centerline of the runway and preclude side-by-side operations with one or both aircraft in a "belly-up" configuration during the turn. Aircraft performance, speed, and the number of degrees of the turn are factors to be considered when vectoring aircraft to parallel runways.*

2. *Variances between heading assigned to intercept the extended centerline of the runway and aircraft ground track are expected due to the effect of wind and course corrections after completion of the turn and pilot acknowledgment of a visual approach clearance.*

3. *Procedures using Radius-to-Fix legs that intercept final may be used in lieu of 30-degree intercept provisions contained in this paragraph.*

REFERENCE–
FAA Publication, Pilot's Handbook of Aeronautical Knowledge, Chapter 15 "Effect of Wind."

4. Intersecting and converging runways. Visual approaches may be conducted simultaneously with visual or instrument approaches to other runways, provided:

(a) Approved separation is maintained until the aircraft conducting the visual approach has been issued, and the pilot has acknowledged receipt of, the visual approach clearance.

(b) When aircraft flight paths intersect, approved separation must be maintained until visual separation is provided.

NOTE–
Although simultaneous approaches may be conducted to intersecting runways, staggered approaches may be necessary to meet the airport separation requirements specified in Paragraph 3–10–4, Intersecting Runway/Intersecting Flight Path Separation.

REFERENCE–
FAA Order 7110.79, Charted Visual Flight Procedures.
FAA Order JO 7110.65, Para 7–4–5, Charted Visual Flight Procedures (CVFP). USA/USN Not Applicable.
FAA Order JO 7110.65, Para 7–7–3, Separation.

7–4–5. CHARTED VISUAL FLIGHT PROCEDURES (CVFP). USA/USN NOT APPLICABLE

Clear an aircraft for a CVFP only when the following conditions are met:

a. There is an operating control tower.

b. The published name of the CVFP and the landing runway are specified in the approach clearance, the reported ceiling at the airport of intended landing is at least 500 feet above the MVA/MIA, and the visibility is 3 miles or more, unless higher minimums are published for the particular CVFP.

c. When using parallel or intersecting/converging runways, the criteria specified in Paragraph 7–4–4, Approaches to Multiple Runways, are applied.

d. An aircraft not following another aircraft on the approach reports sighting a charted visual landmark, or reports sighting a preceding aircraft landing on the same runway and has been instructed to follow that aircraft.

PHRASEOLOGY–
(Ident) CLEARED (name of CVFP) APPROACH.

7–4–6. CONTACT APPROACH

Clear an aircraft for a contact approach only if the following conditions are met:

a. The pilot has requested it.

NOTE–
When executing a contact approach, the pilot is responsible for maintaining the required flight visibility, cloud clearance, and terrain/obstruction clearance. Unless otherwise restricted, the pilot may find it necessary to descend, climb, and/or fly a circuitous route to the airport to maintain cloud clearance and/or terrain/obstruction clearance. It is not in any way intended that controllers will initiate or suggest a contact approach to a pilot.

b. The reported ground visibility is at least 1 statute mile.

c. A standard or special instrument approach procedure has been published and is functioning for the airport of intended landing.

d. Approved separation is applied between aircraft so cleared and other IFR or SVFR aircraft. When applying vertical separation, do not assign a fixed altitude but clear the aircraft at or below an altitude which is at least 1,000 feet below any IFR traffic but not below the minimum safe altitude prescribed in 14 CFR Section 91.119.

NOTE–
14 CFR Section 91.119 specifies the minimum safe altitude to be flown:
(a) Anywhere.
(b) Over congested areas.
(c) Other than congested areas. To provide for an emergency landing in the event of power failure and without undue hazard to persons or property on the surface.
(d) Helicopters. May be operated at less than the minimums prescribed in paras (b) and (c) above if the operation is conducted without hazard to persons or property on the surface.

e. An alternative clearance is issued when weather conditions are such that a contact approach may be impracticable.

PHRASEOLOGY–
CLEARED CONTACT APPROACH,

And if required,
AT OR BELOW (altitude) (routing).

IF NOT POSSIBLE, (alternative procedures), AND ADVISE.

Chapter 8. Offshore/Oceanic Procedures

Section 1. General

8–1–1. ATC SERVICE

Provide air traffic control service in oceanic controlled airspace in accordance with the procedures in this chapter except when other procedures/minima are prescribed in a directive or a letter of agreement.

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

8–1–2. OPERATIONS IN OFFSHORE AIRSPACE AREAS

Provide air traffic control service in offshore airspace areas in accordance with procedures and minima in this chapter. For those situations not covered by this chapter, the provisions in this Order must apply.

8–1–3. VFR FLIGHT PLANS

VFR flights in Oceanic FIRs may be conducted in meteorological conditions equal to or greater than those specified in 14 CFR Section 91.155, Basic VFR weather minimums. Operations on a VFR flight plan are permitted only between sunrise and sunset and only within:

a. Miami, Houston, and San Juan Oceanic Control Areas (CTAs) below FL 180.

b. Within the Oakland FIR when operating less than 100 NM seaward from the shoreline within controlled airspace.

c. All Oceanic FIR airspace below the Oceanic CTAs.

8–1–4. TYPES OF SEPARATION

Separation must consist of at least one of the following:

a. Vertical separation;

b. Horizontal separation, either;

1. Longitudinal; or

2. Lateral;

c. Radar separation, as specified in Chapter 5, Radar, where radar coverage is adequate.

8–1–5. ALTIMETER SETTING

Within oceanic control areas, unless directed and/or charted otherwise, altitude assignment must be based on flight levels and a standard altimeter setting of 29.92 inches Hg.

8–1–6. RECEIPT OF POSITION REPORTS

When a position report affecting separation is not received, take action to obtain the report no later than *10 minutes* after the control estimate, unless otherwise specified.

8–1–7. OCEANIC ERROR REPORT PROCEDURES

FAA Order 7110.82 establishes procedures for reporting Gross Navigation Errors (GNE), height errors, time(longitudinal) errors, intervention, and Special Area of Operations (SAO) verification in oceanic airspace. This data is needed for risk modeling activities to support separation standard reductions.

8–1–8. USE OF CONTROL ESTIMATES

Control estimates are the estimated position of aircraft, with reference to time as determined by the ATC automation system in use or calculated by the controller using known wind patterns, previous aircraft transit times, pilot progress reports, and pilot estimates. These estimates may be updated through the receipt of automated position reports and/or manually updated by the controller. Control estimates must be used when applying time–based separation minima.

8–1–9. RVSM OPERATIONS

Controller responsibilities for non–RVSM aircraft operating in RVSM airspace must include but not be limited to the following:

a. 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.

b. In addition to those aircraft listed in Chapter 2, Section 1, Para 2−1−29, RVSM Operations in this order, the following aircraft operating within oceanic airspace or transiting to/from oceanic airspace are excepted:

1. Aircraft being initially delivered to the State of Registry or Operator;

2. Aircraft that was formerly RVSM approved but has experienced an equipment failure and is being flown to a maintenance facility for repair in order to meet RVSM requirements and/or obtain approval;

3. Aircraft being utilized for mercy or humanitarian purposes;

4. Within the Oakland, Anchorage, and Arctic FIR's, an aircraft transporting a spare engine mounted under the wing.

(a) These exceptions are accommodated on a workload or traffic-permitting basis.

(b) All other requirements contained in Para 2−1−29, RVSM Operations are applicable to this section.

REFERENCE−
FAA Order JO 7110.65, Para 2−1−29, RVSM Operations

Section 9. Pacific ICAO Region

8–9–1. APPLICATION

Provide air traffic control services in the Pacific ICAO Region with the procedures and minima contained in this section except when noted otherwise.

8–9–2. VERTICAL SEPARATION

Provide vertical separation in accordance with Chapter 4, IFR, Section 5, Altitude Assignment and Verification.

8–9–3. LONGITUDINAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 3, Longitudinal Separation, apply the following:

a. Minima based on time:

1. *15 minutes* between aircraft; or

2. *10 minutes* between turbojet aircraft whether in level, climbing or descending flight, provided that the aircraft concerned follow the same track or continuously diverging tracks until some other form of separation is provided; or

3. The prescribed minima in accordance with Para 8–3–3, Mach Number Technique.

4. Reciprocal track aircraft – Where lateral separation is not provided, vertical separation must be provided at least *10 minutes* before and after the time the aircraft are estimated to pass or are estimated to have passed.

b. Clear an aircraft for an ADS-B In Trail Procedure (ITP) climb or descent provided the following conditions are satisfied:

1. The ITP climb or descent has been requested by the pilot;

2. The aircraft identification of each reference aircraft in the ITP request exactly matches the Item 7 - aircraft identification of the corresponding aircraft's filed flight plan;

3. The reported ITP distance between the ITP aircraft and any reference aircraft is 15 NM or more;

4. Both the ITP aircraft and reference aircraft are either on:

(a) Same identical tracks and any turn at a waypoint shall be limited to less than 45 degrees; or

(b) same tracks with no turns permitted that reduce required separation during the ITP.

NOTE–
Same identical tracks are where the angular difference is zero degrees.

5. No speed or route change clearance shall be issued to the ITP aircraft until the ITP climb or descent is completed;

6. The altitude difference between the ITP aircraft and any reference aircraft shall be 2000 ft or less;

7. No instruction to amend speed, altitude or route shall be issued to any reference aircraft until the ITP climb or descent is completed;

8. The maximum closing speed between the ITP aircraft and each reference aircraft shall be Mach 0.06; and

9. The ITP aircraft shall not be a reference aircraft in another ITP clearance.

NOTE–
ATOP is designed to check for the above criteria prior to allowing the minima to be provided.

c. Minima based on distance using Automatic Dependent Surveillance – Contract (ADS–C):

1. Apply the minima as specified in TBL 8–9–1, ADS–C Criteria, between aircraft on the same track within airspace designated for Required Navigation Performance (RNP), provided:

(a) Direct controller/pilot communication via voice or Controller Pilot Data Link Communications (CPDLC) is established, and

(b) The required ADS–C periodic reports are maintained and monitored by an automated flight data processor (e.g., ATOP);

TBL 8–9–1
ADS–C Criteria

Minima	RNP	Maximum ADS–C Periodic Reporting Interval
50 NM	10	27 minutes
50 NM	4	32 minutes
30 NM	4	14 minutes

2. Aircraft on reciprocal tracks may be cleared to climb or descend to or through the altitude(s) occupied by another aircraft provided that:

(a) An ADS–C position report on at least one of the aircraft has been received beyond the passing point, and

(b) The aircraft have passed each other by the applicable separation minimum.

NOTE–
ATOP has been designed to check for the above criteria prior to allowing the minima to be provided.

3. When an ADS–C periodic or waypoint change event report is overdue by *3 minutes*, the controller must take action to obtain an ADS–C report.

4. If no report is received within *6 minutes* of the time the original report was due, the controller must take action to apply another form of separation.

5. Aircraft on the same track may be cleared to climb or descend through the level of another aircraft provided:

(a) The longitudinal distance between the aircraft is determined from near simultaneous ADS–C demand reports and the ATOP software is used to ensure the following conditions are met;

(b) The longitudinal distance between the aircraft, as determined in a) above, is not less than:

(1) 15 NM when the preceding aircraft is at the same speed or faster than the following aircraft; or

(2) 25 NM when the following aircraft is not more than Mach 0.02 faster than the preceding aircraft

(c) The altitude difference between aircraft is not more than 2000 ft;

(d) The clearance is for a climb or descent of 4000 ft or less;

(e) Both aircraft are filed as single flights not flying in formation with other aircraft;

(f) Both aircraft are in level flight at a single altitude;

(g) Both aircraft are same direction;

(h) Neither aircraft are on a weather deviation;

(i) Neither aircraft have an open CPDLC request for a weather deviation;

(j) Neither aircraft are on an offset with a rejoin clearance; and

(k) The clearance is issued with a restriction that ensures vertical separation is re–established within 15 minutes from the first demand report request.

d. Minima based on distance *without* ADS–C:

1. Apply *50 NM* between aircraft cruising, climbing or descending on the same track or reciprocal track that meet the requirements for and are operating within airspace designated for RNP–10 operations provided:

(a) Direct controller/pilot communication via voice or CPDLC is maintained; and

(b) Separation is established by ensuring that at least *50 NM* longitudinal separation minima exists between aircraft positions as reported by reference to the same waypoint.

(1) *Same track aircraft* – whenever possible ahead of both; or

(2) *Reciprocal track aircraft* – provided that it has been positively established that the aircraft have passed each other.

2. Distance verification must be obtained from each aircraft at least every *24 minutes* to verify that separation is maintained.

3. If an aircraft fails to report its position within *3 minutes* after the expected time, the controller must take action to establish communication. If communication is not established within *8 minutes* after the time the report should have been received, the controller must take action to apply another form of separation.

NOTE–
When same track aircraft are at, or are expected to reduce to, the minima, speed control techniques should be applied in order to maintain the required separation.

e. Minima based on DME/RNAV:

Apply the following DME/RNAV minima in Control 1234H, Control 1487H and the Norton Sound High Control areas to turbojet aircraft established on or transitioning to the North Pacific (NOPAC) Route System.

1. *30 NM* between aircraft when DME reports or radar observations are used to establish the distance, otherwise at least *40 NM* based on RNAV must be applied; and

2. Unless both aircraft are radar identified, both aircraft must provide DME/RNAV distance reports via direct voice that indicates the appropriate separation exists; and

3. Application of DME/RNAV separation without direct voice communications may not continue for more than *90 minutes;* and

4. The preceding aircraft is assigned the same or greater Mach number than the following aircraft; and

5. Both aircraft must be advised of the other aircraft involved, including the distance relative to the flights.

EXAMPLE–
"Maintain Mach point eight four, same direction traffic, twelve o'clock, three five miles."

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

8–9–4. LATERAL SEPARATION

In accordance with Chapter 8, Offshore/Oceanic Procedures, Section 4, Lateral Separation, apply the following:

a. Within areas where Required Navigation Performance 10 (RNP–10) separation and procedures are authorized, apply *50 NM* to RNP–10 approved aircraft.

b. Apply *30 NM* to RNP–4 approved aircraft operating within airspace designated for RNP–4 when direct controller/pilot communications, via voice or Controller Pilot Data Link Communications (CPDLC), and the required ADS–C contracts are maintained and monitored by an automated flight data processor (e.g., ATOP).

c. Apply *100 NM* to aircraft not covered by subparagraphs a and b.

8–9–5. PROCEDURES FOR WEATHER DEVIATIONS AND OTHER CONTINGENCIES IN OCEANIC CONTROLLED AIRSPACE

Aircraft must request an ATC clearance to deviate. Since aircraft will not fly into known areas of weather, weather deviation requests should take priority over routine requests. If there is no traffic in the horizontal dimension, ATC must issue clearance to deviate from track; or if there is conflicting traffic in the horizontal dimension, ATC separates aircraft by establishing vertical separation. If there is conflicting traffic and ATC is unable to establish approved separation, ATC must:

a. Advise the pilot unable to issue clearance for requested deviation;

b. Advise the pilot of conflicting traffic; and

c. Request pilot's intentions.

PHRASEOLOGY–
UNABLE (requested deviation), TRAFFIC IS (call sign, position, altitude, direction), SAY INTENTIONS.

NOTE–
1. *The pilot will advise ATC of intentions by the most expeditious means available.*

2. *In the event that pilot/controller communications cannot be established or a revised AT clearance is not available, pilots will follow the procedures outlined in the Regional Supplementary Procedures, ICAO Doc 7030 and Chart Supplements.*

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:
ESTABLISHED ON RNP(EoR) CONCEPT
QFE

e. Terms Deleted
COMPOSITE ROUTE SYSTEM
COMPOSITE SEPARATION
NONCOMPOSITE SEPARATION

f. Terms Modified:
MOUNTAIN WAVE

g. Editorial/format changes were made where necessary. Revision bars were not used due to the insignificant nature of the changes.

COMMON POINT– A significant point over which two or more aircraft will report passing or have reported passing before proceeding on the same or diverging tracks. To establish/maintain longitudinal separation, a controller may determine a common point not originally in the aircraft's flight plan and then clear the aircraft to fly over the point.

(See SIGNIFICANT POINT.)

COMMON PORTION–

(See COMMON ROUTE.)

COMMON ROUTE– That segment of a North American Route between the inland navigation facility and the coastal fix.

OR

COMMON ROUTE– Typically the portion of a RNAV STAR between the en route transition end point and the runway transition start point; however, the common route may only consist of a single point that joins the en route and runway transitions.

COMMON TRAFFIC ADVISORY FREQUENCY (CTAF)– A frequency designed for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower. The CTAF may be a UNICOM, Multicom, FSS, or tower frequency and is identified in appropriate aeronautical publications.

(See DESIGNATED COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) AREA.)

(Refer to AC 90-42, Traffic Advisory Practices at Airports Without Operating Control Towers.)

COMPASS LOCATOR– A low power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). It can be used for navigation at distances of approximately 15 miles or as authorized in the approach procedure.

a. Outer Compass Locator (LOM)– A compass locator installed at the site of the outer marker of an instrument landing system.

(See OUTER MARKER.)

b. Middle Compass Locator (LMM)– A compass locator installed at the site of the middle marker of an instrument landing system.

(See MIDDLE MARKER.)

(See ICAO term LOCATOR.)

COMPASS ROSE– A circle, graduated in degrees, printed on some charts or marked on the ground at an airport. It is used as a reference to either true or magnetic direction.

COMPLY WITH RESTRICTIONS– An ATC instruction that requires an aircraft being vectored back onto an arrival or departure procedure to comply with all altitude and/or speed restrictions depicted on the procedure. This term may be used in lieu of repeating each remaining restriction that appears on the procedure.

COMPOSITE FLIGHT PLAN– A flight plan which specifies VFR operation for one portion of flight and IFR for another portion. It is used primarily in military operations.

(Refer to AIM.)

COMPULSORY REPORTING POINTS– Reporting points which must be reported to ATC. They are designated on aeronautical charts by solid triangles or filed in a flight plan as fixes selected to define direct routes. These points are geographical locations which are defined by navigation aids/fixes. Pilots should discontinue position reporting over compulsory reporting points when informed by ATC that their aircraft is in "radar contact."

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.

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.

CONTINUE– When used as a control instruction should be followed by another word or words clarifying what is expected of the pilot. Example: "continue taxi," "continue descent," "continue inbound," etc.

CONTROL AREA [ICAO]– A controlled airspace extending upwards from a specified limit above the earth.

CONTROL SECTOR– An airspace area of defined horizontal and vertical dimensions for which a controller or group of controllers has air traffic control responsibility, normally within an air route traffic control center or an approach control facility. Sectors are established based on predominant traffic flows, altitude strata, and controller workload. Pilot communications during operations within a sector are normally maintained on discrete frequencies assigned to the sector.

(See DISCRETE FREQUENCY.)

CONTROL SLASH– A radar beacon slash representing the actual position of the associated aircraft. Normally, the control slash is the one closest to the interrogating radar beacon site. When ARTCC radar is operating in narrowband (digitized) mode, the control slash is converted to a target symbol.

CONTROLLED AIRSPACE– An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.

a. Controlled airspace is a generic term that covers Class A, Class B, Class C, Class D, and Class E airspace.

b. Controlled airspace is also that airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements in 14 CFR Part 91 (for specific operating requirements, please refer to 14 CFR Part 91). For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance. Each Class B, Class C, and Class D airspace area designated for an

airport contains at least one primary airport around which the airspace is designated (for specific designations and descriptions of the airspace classes, please refer to 14 CFR Part 71).

c. Controlled airspace in the United States is designated as follows:

1. CLASS A– Generally, that airspace from 18,000 feet MSL up to and including FL 600, including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.

2. CLASS B– Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds."

3. CLASS C– Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually tailored, the airspace usually consists of a surface area with a 5 nautical mile (NM) radius, a circle with a 10NM radius that extends no lower than 1,200 feet up to 4,000 feet above the airport elevation, and an outer area that is not charted. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.

(See OUTER AREA.)

4. CLASS D– Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft.

5. CLASS E– Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Also in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska, up to, but not including 18,000 feet MSL, and the airspace above FL 600.

CONTROLLED AIRSPACE [ICAO]– An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.

Note: Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D, and E.

CONTROLLED TIME OF ARRIVAL– Arrival time assigned during a Traffic Management Program. This time may be modified due to adjustments or user options.

CONTROLLER–

(See AIR TRAFFIC CONTROL SPECIALIST.)

CONTROLLER [ICAO]– A person authorized to provide air traffic control services.

CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC)– A two–way digital communications system that conveys textual air traffic control messages between controllers and

pilots using ground or satellite-based radio relay stations.

CONVECTIVE SIGMET– A weather advisory concerning convective weather significant to the safety of all aircraft. Convective SIGMETs are issued for tornadoes, lines of thunderstorms, embedded thunderstorms of any intensity level, areas of thunderstorms greater than or equal to VIP level 4 with an area coverage of $^{4}/_{10}$ (40%) or more, and hail $^{3}/_{4}$ inch or greater.

(See AIRMET.)
(See AWW.)
(See CWA.)
(See SIGMET.)
(Refer to AIM.)

CONVECTIVE SIGNIFICANT METEOROLOGICAL INFORMATION–

(See CONVECTIVE SIGMET.)

COORDINATES– The intersection of lines of reference, usually expressed in degrees/minutes/seconds of latitude and longitude, used to determine position or location.

COORDINATION FIX– The fix in relation to which facilities will handoff, transfer control of an aircraft, or coordinate flight progress data. For terminal facilities, it may also serve as a clearance for arriving aircraft.

COPTER–

(See HELICOPTER.)

CORRECTION– An error has been made in the transmission and the correct version follows.

COUPLED APPROACH– An instrument approach performed by the aircraft autopilot, and/or visually depicted on the flight director, which is receiving position information and/or steering commands from onboard navigational equipment. In general, coupled non-precision approaches must be flown manually (autopilot disengaged) at altitudes lower than 50 feet AGL below the minimum descent altitude, and coupled precision approaches must be flown manually (autopilot disengaged) below 50 feet AGL unless authorized to conduct autoland operations. Coupled instrument approaches are commonly flown to the allowable IFR weather minima established by the operator or PIC, or flown VFR for training and safety.

COURSE–

a. The intended direction of flight in the horizontal plane measured in degrees from north.

b. The ILS localizer signal pattern usually specified as the front course or the back course.

(See BEARING.)
(See INSTRUMENT LANDING SYSTEM.)
(See RADIAL.)

CPDLC–

(See CONTROLLER PILOT DATA LINK COMMUNICATIONS.)

CPL [ICAO]–

(See ICAO term CURRENT FLIGHT PLAN.)

CRITICAL ENGINE– The engine which, upon failure, would most adversely affect the performance or handling qualities of an aircraft.

CROSS (FIX) AT (ALTITUDE)– Used by ATC when a specific altitude restriction at a specified fix is required.

CROSS (FIX) AT OR ABOVE (ALTITUDE)– Used by ATC when an altitude restriction at a specified fix is required. It does not prohibit the aircraft from crossing the fix at a higher altitude than specified; however, the higher altitude may not be one that will violate a succeeding altitude restriction or altitude assignment.

(See ALTITUDE RESTRICTION.)
(Refer to AIM.)

CROSS (FIX) AT OR BELOW (ALTITUDE)– Used by ATC when a maximum crossing altitude at a specific fix is required. It does not prohibit the aircraft from crossing the fix at a lower altitude; however, it must be at or above the minimum IFR altitude.

(See ALTITUDE RESTRICTION.)
(See MINIMUM IFR ALTITUDES.)
(Refer to 14 CFR Part 91.)

CROSSWIND–

a. When used concerning the traffic pattern, the word means “crosswind leg.”

(See TRAFFIC PATTERN.)

b. When used concerning wind conditions, the word means a wind not parallel to the runway or the path of an aircraft.

(See CROSSWIND COMPONENT.)

CROSSWIND COMPONENT– The wind component measured in knots at 90 degrees to the longitudinal axis of the runway.

CRUISE– Used in an ATC clearance to authorize a pilot to conduct flight at any altitude from the minimum IFR altitude up to and including the altitude specified in the clearance. The pilot may level off at any intermediate altitude within this block of airspace. Climb/descent within the block is to be made at the discretion of the pilot. However, once the pilot starts descent and verbally reports leaving an altitude in the block, he/she may not return to that altitude without additional ATC clearance. Further, it is approval for the pilot to proceed to and make an approach at destination airport and can be used in conjunction with:

a. An airport clearance limit at locations with a standard/special instrument approach procedure. The CFRs require that if an instrument letdown to an airport is necessary, the pilot shall make the letdown in accordance with a standard/special instrument approach procedure for that airport, or

b. An airport clearance limit at locations that are within/below/outside controlled airspace and without a standard/special instrument approach procedure. Such a clearance is NOT AUTHORIZATION for the pilot to descend under IFR conditions below the applicable minimum IFR altitude nor does it imply that ATC is exercising control over aircraft in Class G airspace; however, it provides a means for the aircraft to proceed to destination airport, descend, and land in accordance with applicable CFRs governing VFR flight operations. Also, this provides search and rescue protection until such time as the IFR flight plan is closed.

(See INSTRUMENT APPROACH PROCEDURE.)

CRUISE CLIMB– A climb technique employed by aircraft, usually at a constant power setting, resulting in an increase of altitude as the aircraft weight decreases.

CRUISING ALTITUDE– An altitude or flight level maintained during en route level flight. This is a constant altitude and should not be confused with a cruise clearance.

(See ALTITUDE.)
(See ICAO term CRUISING LEVEL.)

CRUISING LEVEL–
(See CRUISING ALTITUDE.)

CRUISING LEVEL [ICAO]– A level maintained during a significant portion of a flight.

CT MESSAGE– An EDCT time generated by the ATCSCC to regulate traffic at arrival airports. Normally, a CT message is automatically transferred from the traffic management system computer to the NAS en route computer and appears as an EDCT. In the event of a communication failure between the traffic management system computer and the NAS, the CT message can be manually entered by the TMC at the en route facility.

CTA–
(See CONTROLLED TIME OF ARRIVAL.)
(See ICAO term CONTROL AREA.)

CTAF–
(See COMMON TRAFFIC ADVISORY FREQUENCY.)

CTAS–
(See CENTER TRACON AUTOMATION SYSTEM.)

CTOP–
(See COLLABORATIVE TRAJECTORY OPTIONS PROGRAM)

CTRD–
(See CERTIFIED TOWER RADAR DISPLAY.)

CURRENT FLIGHT PLAN [ICAO]– The flight plan, including changes, if any, brought about by subsequent clearances.

CURRENT PLAN– The ATC clearance the aircraft has received and is expected to fly.

CVFP APPROACH–
(See CHARTED VISUAL FLIGHT PROCEDURE APPROACH.)

CWA–
(See CENTER WEATHER ADVISORY and WEATHER ADVISORY.)

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 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 SPACING PROGRAM (ESP)– A program designed to assist the exit sector in achieving the required in-trail spacing.

EN ROUTE TRANSITION–

a. Conventional STARs/SIDs. The portion of a SID/STAR that connects to one or more en route airway/jet route.

b. RNAV STARs/SIDs. The portion of a STAR preceding the common route or point, or for a SID the portion following, that is coded for a specific en route fix, airway or jet route.

ESP–

(See EN ROUTE SPACING PROGRAM.)

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 authorized 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.

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.)

MLDI–

(See METER LIST DISPLAY INTERVAL.)

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.)

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 CENTER (NFDC)– A facility in Washington D.C., established by FAA to operate a central aeronautical information service for the collection, validation, and dissemination of aeronautical data in support of the activities of government, industry, and the aviation community. The information is published in the National Flight Data Digest.

(See NATIONAL FLIGHT DATA DIGEST.)

NATIONAL FLIGHT DATA DIGEST (NFDD)– A daily (except weekends and Federal holidays) publication of flight information appropriate to aeronautical charts, aeronautical publications, Notices to Airmen, or other media serving the purpose of providing operational flight data essential to safe and efficient aircraft operations.

NATIONAL SEARCH AND RESCUE PLAN– An interagency agreement which provides for the effective utilization of all available facilities in all types of search and rescue missions.

NAVAID–

(See NAVIGATIONAL AID.)

NAVAID CLASSES– VOR, VORTAC, and TACAN aids are classed according to their operational use. The three classes of NAVAIDs are:

a. T– Terminal.

b. L– Low altitude.

c. H– High altitude.

Note: The normal service range for T, L, and H class aids is found in the AIM. Certain operational requirements make it necessary to use some of these aids at greater service ranges than specified. Extended range is made possible through flight inspection determinations. Some aids also have lesser service range due to location, terrain, frequency protection, etc. Restrictions to service range are listed in Chart Supplement U.S.

NAVIGABLE AIRSPACE– Airspace at and above the minimum flight altitudes prescribed in the CFRs including airspace needed for safe takeoff and landing.

(Refer to 14 CFR Part 91.)

NAVIGATION REFERENCE SYSTEM (NRS)– The NRS is a system of waypoints developed for use within the United States for flight planning and navigation without reference to ground based navigational aids. The NRS waypoints are located in a grid pattern along defined latitude and longitude lines. The initial use of the NRS will be in the high altitude environment in conjunction with the High Altitude Redesign initiative. The NRS waypoints are intended for use by aircraft capable of point–to–point navigation.

NAVIGATION SPECIFICATION [ICAO]– A set of aircraft and flight crew requirements needed to support performance–based navigation operations within a defined airspace. There are two kinds of navigation specifications:

a. RNP specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP; e.g., RNP 4, RNP APCH.

b. RNAV specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alert-

ing, designated by the prefix RNAV; e.g., RNAV 5, RNAV 1.

Note: The Performance–based Navigation Manual (Doc 9613), Volume II contains detailed guidance on navigation specifications.

NAVIGATIONAL AID– Any visual or electronic device airborne or on the surface which provides point-to-point guidance information or position data to aircraft in flight.

(See AIR NAVIGATION FACILITY.)

NBCAP AIRSPACE–

(See NATIONAL BEACON CODE ALLOCATION PLAN AIRSPACE.)

NDB–

(See NONDIRECTIONAL BEACON.)

NEGATIVE– "No," or "permission not granted," or "that is not correct."

NEGATIVE CONTACT– Used by pilots to inform ATC that:

a. Previously issued traffic is not in sight. It may be followed by the pilot's request for the controller to provide assistance in avoiding the traffic.

b. They were unable to contact ATC on a particular frequency.

NFDC–

(See NATIONAL FLIGHT DATA CENTER.)

NFDD–

(See NATIONAL FLIGHT DATA DIGEST.)

NIGHT– The time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the Air Almanac, converted to local time.

(See ICAO term NIGHT.)

NIGHT [ICAO]– The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be specified by the appropriate authority.

Note: Civil twilight ends in the evening when the center of the sun's disk is 6 degrees below the horizon and begins in the morning when the center of the sun's disk is 6 degrees below the horizon.

NO GYRO APPROACH– A radar approach/vector provided in case of a malfunctioning gyro-compass or directional gyro. Instead of providing the pilot with headings to be flown, the controller observes the radar track and issues control instructions "turn right/left" or "stop turn" as appropriate.

(Refer to AIM.)

NO GYRO VECTOR–

(See NO GYRO APPROACH.)

NO TRANSGRESSION ZONE (NTZ)– The NTZ is a 2,000 foot wide zone, located equidistant between parallel runway or SOIA final approach courses, in which flight is normally not allowed.

NONAPPROACH CONTROL TOWER– Authorizes aircraft to land or takeoff at the airport controlled by the tower or to transit the Class D airspace. The primary function of a nonapproach control tower is the sequencing of aircraft in the traffic pattern and on the landing area. Nonapproach control towers also separate aircraft operating under instrument flight rules clearances from approach controls and centers. They provide ground control services to aircraft, vehicles, personnel, and equipment on the airport movement area.

NONCOMMON ROUTE/PORTION– That segment of a North American Route between the inland navigation facility and a designated North American terminal.

NONDIRECTIONAL BEACON– An L/MF or UHF radio beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his/her bearing to or from the radio beacon and "home" on or track to or from the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

(See AUTOMATIC DIRECTION FINDER.)
(See COMPASS LOCATOR.)

NONMOVEMENT AREAS– Taxiways and apron (ramp) areas not under the control of air traffic.

NONPRECISION APPROACH–

(See NONPRECISION APPROACH PROCEDURE.)

NONPRECISION APPROACH PROCEDURE– A standard instrument approach procedure in which no electronic glideslope is provided; e.g., VOR, TACAN, NDB, LOC, ASR, LDA, or SDF approaches.

NONRADAR– Precedes other terms and generally means without the use of radar, such as:

a. Nonradar Approach. Used to describe instrument approaches for which course guidance on final approach is not provided by ground-based precision or surveillance radar. Radar vectors to the final approach course may or may not be provided by ATC. Examples of nonradar approaches are VOR, NDB, TACAN, ILS, RNAV, and GLS approaches.

(See FINAL APPROACH COURSE.)

(See FINAL APPROACH-IFR.)

(See INSTRUMENT APPROACH PROCEDURE.)

(See RADAR APPROACH.)

b. Nonradar Approach Control. An ATC facility providing approach control service without the use of radar.

(See APPROACH CONTROL FACILITY.)

(See APPROACH CONTROL SERVICE.)

c. Nonradar Arrival. An aircraft arriving at an airport without radar service or at an airport served by a radar facility and radar contact has not been established or has been terminated due to a lack of radar service to the airport.

(See RADAR ARRIVAL.)

(See RADAR SERVICE.)

d. Nonradar Route. A flight path or route over which the pilot is performing his/her own navigation. The pilot may be receiving radar separation, radar monitoring, or other ATC services while on a nonradar route.

(See RADAR ROUTE.)

e. Nonradar Separation. The spacing of aircraft in accordance with established minima without the use of radar; e.g., vertical, lateral, or longitudinal separation.

(See RADAR SEPARATION.)

NON−RESTRICTIVE ROUTING (NRR)− Portions of a proposed route of flight where a user can flight plan the most advantageous flight path with no requirement to make reference to ground−based NAVAIDs.

NOPAC−

(See NORTH PACIFIC.)

NORDO (No Radio)− Aircraft that cannot or do not communicate by radio when radio communication is required are referred to as "NORDO."

(See LOST COMMUNICATIONS.)

NORMAL OPERATING ZONE (NOZ)− The NOZ is the operating zone within which aircraft flight remains during normal independent simultaneous parallel ILS approaches.

NORTH AMERICAN ROUTE− A numerically coded route preplanned over existing airway and route systems to and from specific coastal fixes serving the North Atlantic. North American Routes consist of the following:

a. Common Route/Portion. That segment of a North American Route between the inland navigation facility and the coastal fix.

b. Noncommon Route/Portion. That segment of a North American Route between the inland navigation facility and a designated North American terminal.

c. Inland Navigation Facility. A navigation aid on a North American Route at which the common route and/or the noncommon route begins or ends.

d. Coastal Fix. A navigation aid or intersection where an aircraft transitions between the domestic route structure and the oceanic route structure.

NORTH AMERICAN ROUTE PROGRAM (NRP)− The NRP is a set of rules and procedures which are designed to increase the flexibility of user flight planning within published guidelines.

NORTH ATLANTIC HIGH LEVEL AIRSPACE (NAT HLA)− That volume of airspace (as defined in ICAO Document 7030) between FL 285 and FL 420 within the Oceanic Control Areas of Bodo Oceanic, Gander Oceanic, New York Oceanic East, Reykjavik, Santa Maria, and Shanwick, excluding the Shannon and Brest Ocean Transition Areas. ICAO Doc 007 *North Atlantic Operations and Airspace Manual* provides detailed information on related aircraft and operational requirements.

NORTH MARK− A beacon data block sent by the host computer to be displayed by the ARTS on a 360 degree bearing at a locally selected radar azimuth and distance. The North Mark is used to ensure correct range/azimuth orientation during periods of CENRAP.

NORTH PACIFIC− An organized route system between the Alaskan west coast and Japan.

NOT STANDARD− Varying from what is expected or published. For use in NOTAMs only.

NOT STD-

(See NOT STANDARD.)

NOTAM–

(See NOTICE TO AIRMEN.)

NOTAM [ICAO]– A notice containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

a. I Distribution– Distribution by means of telecommunication.

b. II Distribution– Distribution by means other than telecommunications.

NOTICE TO AIRMEN (NOTAM)– A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

NOTAM(D)– A NOTAM given (in addition to local dissemination) distant dissemination beyond the area of responsibility of the Flight Service Station. These NOTAMs will be stored and available until canceled.

c. FDC NOTAM– A NOTAM regulatory in nature, transmitted by USNOF and given system wide dissemination.

(See ICAO term NOTAM.)

NOTICES TO AIRMEN PUBLICATION– A publication issued every 28 days, designed primarily for the pilot, which contains current NOTAM information considered essential to the safety of flight as well as supplemental data to other aeronautical publications. The contraction NTAP is used in NOTAM text.

(See NOTICE TO AIRMEN.)

NRR–

(See NON–RESTRICTIVE ROUTING.)

NRS–

(See NAVIGATION REFERENCE SYSTEM.)

NTAP–

(See NOTICES TO AIRMEN PUBLICATION.)

NUMEROUS TARGETS VICINITY (LOCATION)– A traffic advisory issued by ATC to advise pilots that targets on the radar scope are too numerous to issue individually.

(See TRAFFIC ADVISORIES.)

Q

Q ROUTE– ‘Q’ is the designator assigned to published RNAV routes used by the United States.

QFE– The atmospheric pressure at aerodrome elevation (or at runway threshold).

QNE– The barometric pressure used for the standard altimeter setting (29.92 inches Hg.).

QNH– The barometric pressure as reported by a particular station.

QUADRANT– A quarter part of a circle, centered on a NAVAID, oriented clockwise from magnetic north as follows: NE quadrant 000-089, SE quadrant 090-179, SW quadrant 180-269, NW quadrant 270-359.

QUEUING–

(See STAGING/QUEUING.)

QUICK LOOK– A feature of the EAS and ARTS which provides the controller the capability to display full data blocks of tracked aircraft from other control positions.

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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

1. PARAGRAPH NUMBER AND TITLE:
1−1−6. SUBMISSION CUTOFF AND EFFECTIVE DATES
1−1−8. RECOMMENDATIONS FOR PROCEDURAL CHANGES

2. BACKGROUND: FAA change−submitting organizations are unclear over the precise meaning of the "Cutoff Date for Submission" when it comes to submitting changes to cyclical orders and other publications. Many organizations assumed that changes could be submitted to the correspondence mailbox on, or close to, the Cutoff Date for Submission and be incorporated into the next publication effective date. In reality, submitted changes require additional time for coordination prior to the cutoff date.

3. CHANGE:

OLD

1−1−6. SUBMISSION CUTOFF AND EFFECTIVE DATES

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

Add

NEW

1−1−6. EFFECTIVE DATES AND SUBMISSIONS FOR CHANGES

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

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

OLD

TBL 1−1−1

Publication Schedule

Basic or Change	Cutoff Date for Submission	Effective Date of Publication
JO 7110.65X	4/27/17	10/12/17
Change 1	10/12/17	3/29/18
Change 2	3/29/18	9/13/18
Change 3	9/13/18	2/28/19
JO 7110.65Y	2/28/19	8/15/19

NEW

TBL 1–1–1

Publication Schedule

Basic or Change	Cutoff Date for Completion	Effective Date of Publication
JO 7110.65X	4/27/17	10/12/17
Change 1	10/12/17	3/29/18
Change 2	3/29/18	9/13/18
Change 3	9/13/18	2/28/19
JO 7110.65Y	2/28/19	8/15/19

OLD	NEW
1–1–8. RECOMMENDATIONS FOR PROCEDURAL CHANGES	**1–1–8. RECOMMENDATIONS FOR PROCEDURAL CHANGES**
Title through **b**	No Change
c. Proposed changes must be submitted, electronically, to the Air Traffic Procedures Correspondence Mailbox at 9–AJV–8–HQ–Correspondence@faa.gov. The submission should include a description of the recommended change, and the proposed language to be used in the order.	No Change
Add	***NOTE–*** ***For details on the submission process as well as additional AJV–8 processing responsibilities, please see FAA Order JO 7000.5 Procedures for Submitting Changes to Air Traffic Control Publications.***

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1. PARAGRAPH NUMBER AND TITLE:
1–2–6. ABBREVIATIONS
5–9–7. SIMULTANEOUS INDEPENDENT APROACHES– DUAL & TRIPLE
5–9–10. SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY–SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS

2. BACKGROUND: The use of Required Navigation Performance (RNP) approach transitions to have aircraft join the final approach course is becoming increasingly common throughout the National Airspace System. Established on RNP (EoR) operations with Radius–to–Fix (RF) legs are approved to widely–spaced parallel runways (more than 9,000 feet centerline spacing) without monitors. A Safety Risk Management Panel completed the required safety risk analysis for conducting RF/Track–to–Fix (TF) EoR operations to dual parallel runways with centerline spacing of 3,600 feet or greater, triple parallel runways with centerline 3,900 feet or greater, and adding TF legs to the widely–spaced runway criteria. Based on the safety risk analysis, EoR can be incorporated into simultaneous instrument approaches to parallel runways during dual and triple operations.

3. CHANGE:

OLD	NEW
1–2–6. ABBREVIATIONS	**1–2–6. ABBREVIATIONS**
Add	**EoR** . . . . . **Established on RNP**
Add	**RF** . . . . . **Radius–to–Fix**
Add	**TF** . . . . . **Track–to–Fix**

OLD	NEW
5–9–7. SIMULTANEOUS INDEPENDENT APROACHES– DUAL & TRIPLE	**5–9–7. SIMULTANEOUS INDEPENDENT APROACHES– DUAL & TRIPLE**
TERMINAL	No Change
a. Apply the following minimum separation when conducting simultaneous independent approaches:	No Change
1. Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft during turn–on to parallel final approach.	**1.** Provide a minimum of 1,000 feet vertical or a minimum of 3 miles radar separation between aircraft**:**
Add	**(a) during turn–on to parallel final approach, or**
Add	**(b) until aircraft are established on a published segment of an approach authorized for Established on RNP (EoR) operations.**
NOTE–	Delete
1. *During triple parallel approaches, no two aircraft will be assigned the same altitude during turn–on. All three aircraft will be assigned altitudes which differ by a minimum of 1,000 feet. Example: 3,000, 4,000, 5,000; 7,000, 8,000, 9,000.*	
2. *Communications transfer to the tower controller's frequency must be completed prior to losing vertical separation between aircraft.*	Delete
Add	***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.***
Add	***REFERENCE–*** ***FAA Order JO 7210.3, Para 10–4–6, Simultaneous Independent Approaches*** ***P/CG Term – Required Navigation Performance (RNP)*** ***P/CG Term – Established on RNP Concept***
a2 through **a3(c)**	No Change
Add	**(d) Parallel approaches to airports where the airport field elevation is more than 2,000 feet MSL require the use of the final monitor aid (FMA) system and an approved FAA aeronautical study.**

4. Provide the minimum applicable radar separation between aircraft on the same final approach course.	No Change
Add	***NOTE–*** ***Except when conducting an EoR operation, no two aircraft will be assigned the same altitude during turn–on to final. All three aircraft will be assigned altitudes which differ by a minimum of 1,000 feet. Example: 3,000, 4,000, 5,000; 7,000, 8,000, 9,000.***
b through **c6** ***NOTE***	No Change
Add	**7. Communications transfer to the tower controller's frequency must be completed prior to losing 1,000 feet vertical or 3 miles radar separation between aircraft.**

OLD	**NEW**
5–9–10. SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY–SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS	**5–9–10. SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY–SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS**
Title through **b1(a)**	No Change
(b) conducting an RNAV (RNP) approach that contains a Radius–to–Fix (RF) leg and an aircraft conducting a straight–in ILS/RNAV with vertical guidance/GLS or another RNAV (RNP) approach with an RF leg until both aircraft are established on their respective approach procedures. Ensure dual RNAV (RNP) approaches that contain RF legs are limited to aircraft approaching from opposite downwinds or base legs and all approach pairings must be conducted so that the approach courses do not overlap.	**(b)** conducting **EoR operations, until aircraft are established on a published segment of an approach authorized for EoR operations.**
Add	***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*	***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***

1. PARAGRAPH NUMBER AND TITLE: 2−1−1. ATC SERVICE

2. BACKGROUND: Air Traffic Control (ATC) facilities are not equipped to track or visually observe an Unmanned Aircraft System (UAS) operating at or below 400ft AGL. Currently, ATC services are not being provided to 14 CFR Part 101 and PART 107 operators. There are no requirements for 14 CFR Part 101 and Part 107 operators to maintain two−way radio communication with ATC. 14 CFR Part 101 and Part 107 require the UAS to remain clear of all other aircraft. In addition, 14 CFR Part 101 and Part 107 require UAS operations to be conducted in a manner that would not endanger the safety of the NAS. The Air Traffic Organization (ATO) is extending that policy to include any UAS operating at or below 400ft AGL.

3. CHANGE:

OLD	**NEW**
2−1−1. ATC SERVICE	**2−1−1. ATC SERVICE**
Title through **d3** ***REFERENCE***	No Change
e. Air Traffic Control services are not provided for model aircraft operating in the NAS.	**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− *This does not relieve model aircraft operators from the requirements of section 336 of Public Law 112−95 and 14 CFR Part 101 including the notification requirement.*	Delete
NOTE− *This does not prohibit ATC from providing services to civil and public UAS.*	***NOTE−*** **1.** *This does not prohibit ATC from providing services to civil and public UAS.*
Add	**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.***

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1. PARAGRAPH NUMBER AND TITLE: 2−1−13. FORMATION FLIGHTS

2. BACKGROUND: Since the original publication of the Air Traffic Control Handbook, 7110.65, on January 1, 1976, there have only been two updates to the formation flight paragraph. The first occurred on April 1, 1979, in FAA Order 7110.65A, Change 5, when language was removed from the main paragraph and added back as two separate notes. The second change was the addition of the RVSM information on August 4, 2005, in FAA Order 7110.65P, Change 3. Over the years the exact meaning of the language in this paragraph has caused confusion. In addition to formal interpretations being issued in 1995, 2001, 2014, and 2017, and an official clarification in 1998, there have been numerous other requests for clarification and guidance from facilities and the service centers regarding different aspects of the paragraph.

3. CHANGE:

OLD	NEW
2–1–13. FORMATION FLIGHTS	**2–1–13. FORMATION FLIGHTS**
a. Control formation flights as a single aircraft. When individual control is requested, issue advisory information which will assist the pilots in attaining separation. When pilot reports indicate separation has been established, issue control instructions as required.	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.**
Add	***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***
Add	**a. Support formation flight join–up for two aircraft when all of the following occur:**
Add	**1. Requested by any participating pilot.**
Add	**2. All participating pilots concur.**
Add	**3. Either of the participating pilots reports the other/s in sight.**
Add	***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."***
Add	**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.**
Add	***REFERENCE–*** ***P/CG Term – Formation Flight***
Add	**c. After join–up, aircraft beacon code assignment will be determined by formation type.**
Add	**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.**
Add	**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.**

Add	***REFERENCE–*** ***FAA Order JO 7610.4, Paragraph 12–11–6, Nonstandard Formation Tactics, subparagraph b3.***
Add	***EXAMPLE–*** ***"N123JP squawk standby."*** ***Or*** ***"N123SP have N123JP squawk standby."***
Add	**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.**
Add	***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."***
NOTE– **1.** *Separation responsibility between aircraft within the formation during transition to individual control rests with the pilots concerned until approved separation has been attained.*	Delete
2. *Formation join–up and breakaway will be conducted in VFR weather conditions unless prior authorization has been obtained from ATC or individual control has been approved.*	Delete
b	Re–letter as **e.**

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1. PARAGRAPH NUMBER AND TITLE: 2–9–2. OPERATING PROCECURES

2. BACKGROUND: Guidance in FAA Order JO 7110.65 regarding ensuring pilots receive the most current pertinent Automatic Terminal Information Service (ATIS) information has caused confusion and appears contradictory at times. Over the past several years there have been two interpretations issued on this topic. In 2014, the National Transportation Safety Board (NTSB) issued a recommendation related to "pertinent remarks." This resulted in the issuance of a Mandatory Briefing Item to address the NTSB's recommendations. Additionally, an Air Traffic Safety Action Program Information Request was generated as a result of questions regarding ATIS operating procedures.

3. CHANGE:

OLD	NEW
2–9–2. OPERATING PROCECURES	**2–9–2. OPERATING PROCECURES**
Title through **b** ***EXAMPLE***	No Change
c. Broadcast on all appropriate frequencies to advise aircraft of a change in the ATIS code/message.	**c. Controllers must ensure that pilots receive the most current pertinent information by taking the following actions, as applicable:**
Add	**1. When a pilot does not state the appropriate ATIS code on initial contact, ask the pilot to confirm receipt of the current ATIS information.**
Add	***EXAMPLE–*** ***"Verify you have information CHARLIE."*** ***"Information CHARLIE current. Advise when you have CHARLIE."***
Add	**2. When a pilot is unable to receive the ATIS, issue the current weather, runway in use, approach/departure information, pertinent NOTAMs, and airport conditions.**
Add	***EXAMPLE–*** ***"Wind two five zero at one zero. Visibility one zero. Ceiling four thousand five hundred broken. Temperature three four. Dew point two eight. Altimeter three zero one zero. ILS–DME Runway Two Seven Approach in use. Departing Runway Two Two Right. Hazardous Weather Information for (geographical area) available on HIWAS or Flight Service Frequencies. Braking Action advisories are in effect."***
d. Controllers must ensure that pilots receive the most current pertinent information. Ask the pilot to confirm receipt of the current ATIS information if the pilot does not initially state the appropriate ATIS code. Controllers must ensure that changes to pertinent operational information is provided after the initial confirmation of ATIS information is established. Issue the current weather, runway in use, approach information, and pertinent NOTAMs to pilots who are unable to receive the ATIS.	**d. Advise aircraft of changes to the ATIS code by broadcasting the change on all appropriate frequencies. The broadcast must include changes to pertinent operational information, when known, that necessitated the ATIS change.**
EXAMPLE– *"Verify you have information ALPHA."* *"Information BRAVO now current, visibility three miles."* *"Information CHARLIE now current, Ceiling 1500 Broken."* *"Information CHARLIE now current, advise when you have CHARLIE."*	***EXAMPLE–*** ***"Attention all aircraft, information ALPHA current."*** ***"Attention all aircraft, information BRAVO current. MICROBURST advisories in effect."*** ***"Attention all aircraft, information CHARLIE current. Numerous flocks of ducks in the immediate vicinity of (name) airport, altitude unknown."***
Add	***REFERENCE–*** ***FAA Order JO 7110.65, Para 2–9–3, Content***

Add	***NOTE–*** **1.** ***No additional acknowledgement is required when a controller broadcasts information subsequent to the pilot's initial acknowledgement of the ATIS. Requiring each aircraft to acknowledge receipt of pertinent changes (broadcast) after initial confirmation of the ATIS could significantly impact workload.***
Add	**2.** ***Pertinent conditions are those that have a clear decisive relevance to the safety of air traffic. As noted in Paragraph 2–1–2, Duty Priority, there are many variables involved that make it virtually impossible to develop a standard list of changes that are classified as relevant to every conceivable situation. Each set of circumstances must be evaluated on its own merit, and when more than one action is required, controllers must exercise their best judgment based on the facts and circumstances known to them.***

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1. PARAGRAPH NUMBER AND TITLE:
4–5–2. FLIGHT DIRECTION
8–1–4. TYPES OF SEPARATION
8–9–2. VERTICAL SEPARATION
8–9–4. LATERAL SEPARATION
8–9–5. COMPOSITE SEPARATION
8–9–6. COMPOSITE SEPARATION ALTITUDE ASSIGNMENT
8–9–7. COMPOSITE SEPARATION APPLICATION

2. BACKGROUND: FAA Order JO 7110.65, Air Traffic Control, Chapter 8, Oceanic/Offshore Procedures, outlines air traffic control services in oceanic controlled airspace. Section 9 of this chapter discusses composite separation, which is defined in this order as "a method of separating aircraft in a composite route system where, by management of route and altitude assignments, a combination of half the lateral minimum specified for the area concerned and half the vertical minimum is applied." According to Paragraph 8–9–5, ATC provides composite separation within the Central East Pacific (CEP), the North Pacific composite route systems, and where designated by facility directive in the Pacific Organized Track System at and above flight level 290 as (a) 1,000 feet vertical separation and (b) 50 nautical miles lateral separation. Paragraphs 8–9–6 and 8–9–7 provide greater detail on composite separation altitude assignments and application. Similar references to composite separation and its use can be found in International Civil Aviation Organization (ICAO) Document 7030, Regional Supplementary Procedures. A Safety and Technical Training (AJI) Safety Engineering Team, from AJI–314, facilitated a Safety Risk Management (SRM) panel on behalf of the Oceanic/Offshore Standards and Procedures Group (AJV–84). The SRM panel identified and assessed potential safety risks associated with this change. Additionally, AJV–84 intends to follow a similar proposal for ICAO Doc 7030.

3. CHANGE:

OLD

TBL 4–5–1

Altitude Assignment

Aircraft Operating	On course degrees magnetic	Assign	Examples
Below 3,000 feet above surface	Any course	Any altitude	
At and below FL 410	0 through 179	Odd cardinal altitude or flight levels at intervals of 2,000 feet	3,000, 5,000, FL 310, FL 330
	180 through 359	Even cardinal altitude or flight levels at intervals of 2,000 feet	4,000, 6,000, FL 320, FL 340
Above FL 410	0 through 179	Odd cardinal flight levels at intervals of 4,000 feet beginning with FL 450	FL 450, FL 490, FL 530
	180 through 359	Odd cardinal flight levels at intervals of 4,000 feet beginning with FL 430	FL 430, FL 470, FL 510
One way routes (except in composite systems)	Any course	Any cardinal altitude or flight level below FL 410 or any odd cardinal flight level above FL 410	FL 270, FL 280, FL 290, FL 300, FL 310, FL 410, FL 430, FL 450
Within an ALTRV	Any course	Any altitude or flight level	
In transition to/from or within Oceanic airspace where composite separation is authorized	Any course	Any odd or even cardinal flight level including those above FL 290	FL 280, FL 290, FL 300, FL 310, FL 320, FL 330, FL 340
In aerial refueling tracks and anchors	Any course	Altitude blocks as requested. Any altitude or flight level	050B080, FL 180B220, FL 280B310

NEW

TBL 4–5–1

Altitude Assignment

Aircraft Operating	On course degrees magnetic	Assign	Examples
Below 3,000 feet above surface	Any course	Any altitude	
At and below FL 410	0 through 179	Odd cardinal altitude or flight levels at intervals of 2,000 feet	3,000, 5,000, FL 310, FL 330
	180 through 359	Even cardinal altitude or flight levels at intervals of 2,000 feet	4,000, 6,000, FL 320, FL 340
Above FL 410	0 through 179	Odd cardinal flight levels at intervals of 4,000 feet beginning with FL 450	FL 450, FL 490, FL 530
	180 through 359	Odd cardinal flight levels at intervals of 4,000 feet beginning with FL 430	FL 430, FL 470, FL 510
One way routes	Any course	Any cardinal altitude or flight level below FL 410 or any odd cardinal flight level above FL 410	FL 270, FL 280, FL 290, FL 300, FL 310, FL 410, FL 430, FL 450
Within an ALTRV	Any course	Any altitude or flight level	
In aerial refueling tracks and anchors	Any course	Altitude blocks as requested. Any altitude or flight level	050B080, FL 180B220, FL 280B310

OLD	**NEW**
8–1–4. TYPES OF SEPARATION	**8–1–4. TYPES OF SEPARATION**
Title through **b2**	No Change
c. Composite separation;	Delete
d	Re–letter as **c**.

OLD	NEW
8–9–2. VERTICAL SEPARATION	**8–9–2. VERTICAL SEPARATION**
Provide vertical separation in accordance with Chapter 4, IFR, Section 5, Altitude Assignment and Verification, except when aircraft operate within airspace where composite separation and procedures are authorized, apply the minima specified in para 8–9–5, Composite Separation Minima.	Provide vertical separation in accordance with Chapter 4, IFR, Section 5, Altitude Assignment and Verification.

OLD	NEW
8–9–4. LATERAL SEPARATION	**8–9–4. LATERAL SEPARATION**
Title through **b**	No Change
c. When aircraft operate within airspace where composite separation and procedures are authorized, apply the minimum specified in para 8–9–5, Composite Separation Minima.	Delete
d. Apply 100 NM to aircraft not covered by subparas a, b or c.	**c.** Apply 100 NM to aircraft not covered by **subparagraphs a and b.**

OLD	NEW
8–9–5. COMPOSITE SEPARATION MINIMA	Delete
Provide composite separation within the Central East Pacific (CEP) and North Pacific (NOPAC) composite route systems and where designated by facility directive in the Pacific Organized Track System (PACOTS) at and above FL 290 as follows:	Delete
a. *1,000 feet* vertical separation; and	Delete
b. *50 NM* lateral separation.	Delete

OLD	NEW
8–9–6. COMPOSITE SEPARATION ALTITUDE ASSIGNMENT	Delete
a. Aircraft operating at or above FL 300 in a composite route system may be cleared at even flight levels. Additionally, aircraft may be cleared at even flight levels while joining, crossing, or leaving a composite route system provided such aircraft leaving the system are cleared to an appropriate odd cardinal flight level when noncomposite vertical or lateral separation is achieved.	Delete
b. Aircraft (operating at or above FL 300) leaving a composite route system at an even cardinal flight level do not have to be assigned an odd cardinal flight level provided:	Delete
1. The aircraft is being provided radar service; and	Delete

2. The aircraft will be cleared for descent and approach to an airport within the facility's domestic FIR; and	Delete
3. There is an operational advantage.	Delete
c. Aircraft operating on unidirectional routes or traffic flows may be assigned altitudes other than the appropriate altitude for direction of flight provided that 2,000 feet vertical separation is maintained between aircraft operating on the same route.	Delete

OLD	**NEW**
8–9–7. COMPOSITE SEPARATION APPLICATION	Delete
Provide composite separation in the CEP and the North Pacific (NOPAC) composite route systems and where designated by facility directive in the Pacific Organized Track System (PACOTS) as follows:	Delete
a. Clear an aircraft to join an outer route of the composite route system at other than the normal entry point provided:	Delete
1. Longitudinal or noncomposite vertical separation exists between that aircraft and any other aircraft on that route; and	Delete
2. Composite separation exists between that aircraft and any other aircraft on the next adjacent route.	Delete
b. Clear an aircraft to leave an outer route of the composite route system at other than the normal exit point provided its course diverges so that lateral spacing from the route system increases until noncomposite separation exists between that aircraft and any other aircraft in the composite route system.	Delete
c. Clear an aircraft to change from one route to an adjacent route within the composite route system provided:	Delete
1. Longitudinal or noncomposite vertical separation is maintained between that aircraft and any other aircraft on the route being vacated until that aircraft is established on the route to which it is proceeding; and	Delete
2. Longitudinal or noncomposite vertical separation exists between that aircraft and any other aircraft on the route to which that aircraft is proceeding; and	Delete

3. Composite separation exists between that aircraft and any other aircraft on the next adjacent route.	Delete
d. Clear an aircraft to cross the composite route system provided longitudinal or noncomposite vertical or lateral separation exists between that aircraft and any other aircraft in the composite route system.	Delete
e. Clear aircraft to transition to or from the composite route system from an Oceanic Transition Route (OTR) provided:	Delete
1. The OTR is charted on aeronautical charts; and	Delete
2. Composite separation is maintained between that aircraft and any other aircraft within the composite route system; and	Delete
NOTE– *An aircraft is within the confines of a composite route system when the aircraft joins or crosses the outer route of the composite route system or passes a composite route entry point.*	Delete
3. Composite separation is maintained between that aircraft and any other aircraft on adjacent OTRs.	Delete
f. Clear an aircraft to change altitude on a route if noncomposite separation exists between that aircraft and others operating on that route regardless of other aircraft operating on adjacent routes in the system. Pilot's discretion climbs and descents are not authorized when applying composite separation.	Delete
NOTE– *Although composite separation is not applied between aircraft on different tracks at FL 280 and FL 290, this paragraph applies to climbs and descents between FL 280 and altitudes within the composite altitude stratum (FL 300 and above).*	Delete
8–9–8	Renumber as **8–9–5.**

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1. PARAGRAPH NUMBER AND TITLE: 4–5–7. ALTITUDE INFORMATION

2. BACKGROUND: Users and controllers agree that after a climb or descend via clearance is issued, vertical navigation (VNAV) can begin anytime at the discretion of the pilot. A recent inquiry by a foreign air carrier uncovered that while the guidance regarding VNAV for aircraft established on a STAR is clear, the guidance is not clear for aircraft navigating a published route inbound to but not yet established on a procedure.

3. CHANGE:

OLD	NEW
4–5–7. ALTITUDE INFORMATION	**4–5–7. ALTITUDE INFORMATION**
Title through **g**	No Change
h. Instructions to vertically navigate on a STARs/SIDs with published crossing restrictions.	**h.** Instructions to vertically navigate SIDs/STARs with published crossing restrictions **(Climb Via/Descend Via).**
Add	**1. When established on the SID/STAR.**
Add	**2. When navigating a published route inbound to the STAR.**
Add	**3. When cleared direct to a waypoint/fix without a published altitude, assign a crossing altitude.**
PHRASEOLOGY–	***PHRASEOLOGY–***
DESCEND VIA (STAR name and number).	*DESCEND VIA (STAR name and number).*
TERMINAL: DESCEND VIA (STAR name and number and runway number).	***DESCEND VIA (STAR name and number and runway transition number)***
CLIMB VIA (SID name and number).	*DESCEND VIA (STAR name and number and runway number).*
	CLIMB VIA (SID name and number).
	PROCEED DIRECT (fix/waypoint),CROSS (waypoint/fix) at (altitude) THEN DESCEND VIA (STAR name and number)
EXAMPLE–	***EXAMPLE–***
"Descend via the Eagul Five arrival."	*"Descend via the Eagul Five arrival."*
"Cross Gramm at or above flight level one eight zero, then descend via the Riivr Two arrival."	***"Descend via the Wynde Eight Arrival, Runway 28 right transition."***
TERMINAL: "Descend via the Lendy One Arrival, Runway 22 left."	*"Descend via the Lendy One Arrival, Runway 22 left."*
"Climb via the Dawgs Four Departure."	*"Climb via the Dawgs Four Departure."*
	"Proceed direct Denis, cross Denis at or above flight level two zero zero, then descend via the Mmell One arrival."
NOTE–	***NOTE–***
When cleared for STARs that contain published speed restrictions, the pilot must comply with those speed restrictions independent of any descend via clearance. Clearance to "descend via" authorizes pilots:	***Pilots must comply with all published speed restrictions on SIDs/STARs, independent of a climb via or descend via clearance.*** *Clearance to "descend via" authorizes pilots:*
1. *To descend at pilot discretion to meet published restrictions and laterally navigate on a STAR. Pilots navigating on a STAR must maintain the last assigned altitude until receiving clearance to descend via. Once departing an altitude the pilot may not return to that altitude without an ATC clearance.*	***1.*** *To descend at pilot discretion to meet published restrictions on a STAR. Pilots navigating on a STAR must maintain the last assigned altitude until receiving clearance to descend via.* ***Once leaving*** *an altitude, the pilot may not return to that altitude without an ATC clearance.*

2. *When cleared to a waypoint depicted on a STAR, to descend from a previously assigned altitude at pilot's discretion to the altitude depicted for that waypoint. ATC assigned altitudes must ensure obstacle clearance.*	**2.** ***When cleared direct to a waypoint, to descend at pilot discretion to meet restrictions on the procedure. ATC assumes obstacle clearance responsibility for aircraft not yet established or taken off of a procedure****.*
3. *Once established on the depicted arrival, to descend and to meet all published or assigned altitude and/or speed restrictions. Where speed restrictions are published at the waypoint/fix pilots will begin slowing to comply with the restrictions prior to reaching the waypoint/fix.*	**3.** ***To adjust speeds prior to reaching waypoints with published speed restrictions.***
NOTE– *When cleared for SIDs that contain published speed restrictions, the pilot must comply with those speed restrictions independent of any "climb via" clearance. Clearance to "climb via" authorizes pilots:* **1.** *When used in the IFR departure clearance, in a PDC, DCL or when subsequently cleared after departure to a waypoint depicted on a SID, to join a procedure after departure or resume a procedure.* **2.** *When vertical navigation is interrupted and an altitude is assigned to maintain which is not contained on the published procedure, to climb from that previously-assigned altitude at pilot's discretion to the altitude depicted for the next waypoint. ATC must ensure obstacle clearance until the aircraft is established on the lateral and vertical path of the SID.* **3.** *Once established on the depicted departure, to climb and to meet all published or assigned altitude and speed restrictions.*	No Change
REFERENCE– *FAA Order JO 7110.65, Para 4–4–2, Route Structure Transitions* *FAA Order JO 7110.65, Para 4–5–6, Minimum En Route Altitudes* *FAA Order JO 7110.65, Para 5–5–9, Separation From Obstructions* *PCG, Climb Via, Descend Via.*	No Change
NOTE– *Pilots cleared for vertical navigation using the phraseology "descend via" or "climb via" must inform ATC, upon initial contact, of the altitude leaving, the runway transition or landing direction if assigned (STARs), and any assigned restrictions not published on the procedure.*	No Change

EXAMPLE– *"Delta One Twenty One leaving flight level one niner zero, descending via the Eagul Five arrival runway two-six transition."* *"Delta One Twenty One leaving flight level one niner zero for one two thousand, descending via the Eagul Five arrival, runway two-six transition."* *"JetBlue six zero two leaving flight level two one zero descending via the Ivane Two arrival landing south."* *"Cactus Seven Eleven leaving two thousand climbing via the Laura Two departure."* *"Cactus Seven Eleven leaving two thousand for one-six thousand, climbing via the Laura Two departure."*	No Change
REFERENCE– *AIM, Para 5-2-8, Instrument Departure Procedures (DP) – Obstacle Departure Procedures (ODP) and Standard Instrument Departures (SID)* *PCG, Top Altitude, Bottom Altitude* *AIM, Para 5-4-1, Standard Terminal Arrival (STAR) Procedures.*	No Change
1. Assign an altitude to cross the waypoint/fix, if no altitude is depicted at the waypoint/fix, for aircraft on a direct routing to a STAR or SID waypoint/fix.	Delete
EXAMPLE– ***1.*** *"Proceed direct Denis, cross Denis at or above flight level two zero zero, then descend via the Mmell One arrival."*	Delete
NOTE– *In Example 1 the aircraft will maintain FL200 or higher until reaching Denis. The pilot will then comply with the Mmell One arrival lateral path and published speed restrictions and will descend at pilot discretion to comply with published altitude restrictions. The aircraft may begin slowing prior to Denis to comply with any published speed restrictions at that waypoint.*	Delete
EXAMPLE– ***2.*** *"Proceed direct Rockr, cross Rockr at or above one–zero thousand, climb via the Bizee Two departure."*	Delete
NOTE– *In Example 2 the aircraft will join the Bizee Two departure at Rockr and will then comply with departure published lateral path, published speed and altitude restrictions.*	Delete
h1 to **h7**	Renumber **h1** as **h9.**

1. PARAGRAPH NUMBER AND TITLE: 5−5−2. TARGET SEPARATION

2. BACKGROUND: "Digital Target" and "Digitized Target" both refer to processed, graphical information that represent an aircraft's position on approved displays. Terminal Controller Workstations (TCW) used in Standard Terminal Automation Replacement System (STARS) are "digital displays". Radar Alphanumeric Display Subsystem (RADS) displays are "analog" displays. "Digital targets" are displayed on TCWs and "digitized targets" are displayed on RADS.

3. CHANGE:

OLD	NEW
5−5−2. TARGET SEPARATION	**5−5−2. TARGET SEPARATION**
Title through **c**	No Change
d. All−digital displays. Between the centers of digitized targets. Do not allow digitized targets to touch.	**d.** All−digital displays. Between the centers of **digital** targets**; d**o not allow **digital** targets to touch.
REFERENCE− *FAA Order JO 7110.65, Para 5−9−7, Simultaneous Independent Approaches− Dual & Triple*	No Change

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1. PARAGRAPH NUMBER AND TITLE: 5−5−4. MINIMA

2. BACKGROUND: FAA Order JO 7110.65 Chapter 5, Section 5, Radar Separation, was changed to allow ASR−11 MSSR terminal facilities to utilize 3−mile separation to 60 NM from the sensor antenna after an analytical study was completed by the FAA Flight Systems Laboratory. The study concluded that the performance of the ASR−11 MSSR was equivalent to the performance of an ASR−9 with Mode S. ASR−9 with Mode S terminal facilities had previously been certified for operations to 60 NM from the sensor site. FAA Order JO 7110.65 was changed to allow En Route Automation Modernization (ERAM) facilities to expand their 3 nautical mile (NM) operations out to 60 NM and up to and including FL 230 when utilizing ASR−9 with Mode S or ASR−11 MSSR. Currently, Microprocessor En Route Automated Radar Tracking System (MEARTS) facilities have the option of utilizing a separation standard minima of 3 NM if certain criteria are first met, but only out to 40 NM from the sensor site and up to but not including FL 180. Since MEARTS receives surveillance data directly from ASR−9 with Mode S and ASR−11 MSSR sensor sites, increasing the usability of the existing installed infrastructure by increasing the usable mileage from 40 NM to 60 NM and raising the ceiling to FL 230 will increase the efficiency of the National Airspace System (NAS), with no impact on overall safety.

3. CHANGE:

OLD	NEW
5−5−4. MINIMA	**5−5−4. MINIMA**
Title through **e3(b)**	No Change
(c) Within 40 miles of the antenna.	**(c)** Within 40 **NM** of the **sensor or within 60 NM of the sensor when using ASR−9 with Mode S or ASR−11 MSSR Beacon and within the 3 NM separation area.**
(d) Below FL 180.	**(d) Up to and including FL230.**
e3(e) through **e4**	No Change
(a) Less than 40 miles from the antenna, below FL180, and targets are from the adapted sensor.	**(a) Up to and including FL230 within** 40 miles from the antenna **or within 60 NM when using ASR−9 with Mode S or ASR−11 MSSR Beacon** and targets are from the adapted sensor.

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1. PARAGRAPH NUMBER AND TITLE: 5−5−9. SEPARATION FROM OBSTRUCTION

2. BACKGROUND: FAA Order 8260.3C, United States Standard for Terminal Instrument Procedures (TERPS) permits a 3 mile separation standard from obstructions within 60 NM of the radar antenna when using a Monopulse Secondary Surveillance Radar (MSSR) system. An MSSR has been characterized as the ASR−9 with Mode S, and the ASR−11 with its MSSR beacon system. The Flight Systems Laboratory, AFS−450, completed a safety study, DOT−FAA−AFS−450−59, in 2011 that permits the use of 3 NM separation from obstacles when less than 60 NM from the radar antenna under specific circumstances. Paragraph 5−5−4, Minima, has already been revised to account for previous safety studies and the criteria in TERPS. On March 2, 2017, AFS−400 provided Air Traffic Procedures with a technical memorandum revising the original report. It recognized that the assumption of no ATC intervention until reaching a 3 NM buffer boundary is not consistent with ATC practices. The conclusions indicate the aircraft would be able to maintain a reasonable physical separation from the obstruction when using the requested ±2 Azimuth Change Pulse (ACP) azimuth tolerance which is required for system certification. All other conditions in the technical report remain in place.

3. CHANGE:

OLD	NEW
5−5−9. SEPARATION FROM OBSTRUCTION	**5−5−9. SEPARATION FROM OBSTRUCTION**
Title through **a2**	No Change
Add	**3. For single sensor ASR−9 with Mode S, when less than 60 miles from the antenna – *3 miles*.**
Add	**4. For single sensor ASR−11 MSSR Beacon, when less than 60 miles from the antenna – *3 miles*.**
Add	**5. FUSION:**
Add	**(a) Fusion target symbol – *3 miles*.**
Add	**(b) When ISR is displayed – *5 miles*.**
Add	***NOTE−*** ***When operating in FUSION, distances from the antenna listed in paragraph 5−5−9, a1 through a4, do not apply.***

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1. PARAGRAPH NUMBER AND TITLE: 5−6−2. METHODS

2. BACKGROUND: A change to this paragraph was originally published on May 26, 2016. After publication, it was identified that the phraseology examples do not match the prescribed phraseology.

3. CHANGE:

OLD	NEW
5−6−2. METHODS	**5−6−2. METHODS**
Title through **f**	No Change
PHRASEOLOGY− *PROCEED DIRECT (NAVAID, fix, waypoint) CROSS (NAVAID, fix waypoint) AT/AT OR ABOVE/AT OR BELOW (altitude) then CLIMB VIA/DESCEND VIA (SID/STAR)*	***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)*