

**CHANGE**

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

**Air Traffic Organization Policy**

**JO 7110.65X  
CHG 1**

**Effective Date:**  
March 29, 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](http://faa.gov/air_traffic/publications) and [https://employees.faa.gov/tools\\_resources/orders\\_notices/](https://employees.faa.gov/tools_resources/orders_notices/).
- 4. Explanation of Policy Change.** See the Explanation of Changes attachment which has editorial corrections and changes submitted through normal procedures. The Briefing Guide lists only new or modified material, along with background.
- 5. Distribution.** This change is distributed to selected offices in Washington headquarters, regional offices, service area offices, the William J. Hughes Technical Center, and the Mike Monroney Aeronautical Center. Also, copies are sent to all air traffic field facilities and international aviation field offices; and to interested aviation public.
- 6. Disposition of Transmittal.** Retain this transmittal until superseded by a new basic order.
- 7. Page Control Chart.** See the page control chart attachment.

Original Signed By: *Kevin Chamness* for

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

Date: February 20, 2018



# Explanation of Changes

## Change 1

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

### **a. 2-1-4. OPERATIONAL PRIORITY**

This change adds the term FALLEN HERO and provides guidance on priority handling of these flights, when able.

### **b. 2-6-4. ISSUING WEATHER AND CHAFF AREAS**

This change adds the correlation of the six STARS weather levels into four precipitation intensity levels.

### **c. 3-3-7. FAR FIELD MONITOR (FFM) REMOTE STATUS UNIT**

This change aligns its content with FAA Order 6750.24, Appendix A, requiring that the remote sensor unit must be operational when the weather is below CAT II ILS minimums.

### **d. 3-4-10. RUNWAY EDGE LIGHTS 3-4-15. SIMULTANEOUS APPROACH AND RUNWAY EDGE LIGHT OPERATION**

This change updates the requirements for runway edge lights usage.

### **e. 3-7-2. TAXI AND GROUND MOVEMENT OPERATIONS**

This change requires controllers, when a runway hold short instruction is required, to issue only the portion of the taxi/route instruction up to the runway hold short point. This change also adds instructions to issue a hold short of a departure hold area and adds a when required component.

### **f. 3-9-4. LINE UP AND WAIT (LUAW)**

This change adds guidance on LUAW clearance and clarifies the meaning of the phrase “imminent departure.”

### **g. 5-2-18. VALIDATION OF MODE C READOUT**

This change removes the requirement to validate Mode C readouts between En Route Automation Modernization (ERAM) facilities, except in certain circumstances.

### **h. 5-4-7. POINT OUT**

### **13-1-8. RECORDING OF CONTROL DATA**

After initiating a point out, this change will allow controllers using ERAM to receive non-verbal approval via a coordination portal of the full data block. Automated approval is also reflected on the En Route Decision Support Tool (EDST) display.

### **i. 5-4-8. AUTOMATED INFORMATION TRANSFER (AIT)**

### **5-4-9. INTERFACILITY AUTOMATED INFORMATION TRANSFER**

This change adds language into paragraph 5-4-8 to delete the same facility limitation and include letters of agreement (LOA), adds a clarifying note as to the purpose of Automated Information Transfer (AIT), deletes paragraph 5-4-9 entirely, renumbers two subsequent paragraphs, and corrects several references.

### **j. 5-9-7. SIMULTANEOUS INDEPENDENT APPROACHES- DUAL & TRIPLE**

This change removes the prohibition to the use of Fused Display Mode (FUSION) on Final Monitor Aid (FMA) displays when conducting final monitor activities.

### **k. 7-4-3. CLEARANCE FOR VISUAL APPROACH**

This change provides clarity and assists controllers in understanding that pilot-applied visual separation must only be used at airports with an operating control tower. It adds a reference to paragraph 7-2-1 to support the requirement that approved separation must exist after the application of pilot-applied visual separation.

### **l. 9-2-20. WEATHER RECONNAISSANCE FLIGHTS**

This change adds guidance on handling aircraft operations associated with Weather Reconnaissance Area (WRA) and provides a reference to the National Hurricane Operations Plan (NHOP) Memorandum of Agreement (MOA).

**m. 9-2-23. OPEN SKIES TREATY AIR-CRAFT**

This change updates and clarifies: (1) that Open Skies Treaty (F and D) aircraft are nonparticipating aircraft, (2) modifies the time requirement for coordination and the using agency to deactivate/release SUA/ATCAA to the controlling agency, (3) identifies differences between SUA/ATCAA with or without an associated ATC facility, and (4) an

LOA/LOP is not required to transit deactivated/released SUA/ATCAA airspace.

**n. Entire publication**

Due to a change in Air Traffic position classification, the term “front-line manager” has been replaced with “operations supervisor.”

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

## PAGE CONTROL CHART

REMOVE PAGES	DATED	INSERT PAGES	DATED
Table of Contents i through xx . . . . .	10/12/17	Table of Contents i through xx . . . . .	3/29/18
1-2-5 through 1-2-7 . . . . .	10/12/17	1-2-5 through 1-2-7 . . . . .	3/29/18
2-1-1 through 2-1-14 . . . . .	10/12/17	2-1-1 through 2-1-14 . . . . .	3/29/18
2-3-5 . . . . .	11/10/16	2-3-5 . . . . .	10/12/17
2-3-6 . . . . .	10/12/17	2-3-6 . . . . .	10/12/17
2-6-1 . . . . .	10/12/17	2-6-1 . . . . .	10/12/17
2-6-2 through 2-6-6 . . . . .	10/12/17	2-6-2 through 2-6-6 . . . . .	3/29/18
2-9-1 . . . . .	10/12/17	2-9-1 . . . . .	10/12/17
2-9-2 and 2-9-3 . . . . .	10/12/17	2-9-2 and 2-9-3 . . . . .	3/29/18
3-3-3 . . . . .	10/12/17	3-3-3 . . . . .	10/12/17
3-3-4 . . . . .	10/12/17	3-3-4 . . . . .	3/29/18
3-4-3 through 3-4-5 . . . . .	10/12/17	3-4-3 through 3-4-5 . . . . .	3/29/18
3-7-1 . . . . .	10/12/17	3-7-1 . . . . .	10/12/17
3-7-2 through 3-7-6 . . . . .	10/12/17	3-7-2 through 3-7-6 . . . . .	3/29/18
3-9-1 . . . . .	10/12/17	3-9-1 . . . . .	10/12/17
3-9-2 through 3-9-13 . . . . .	10/12/17	3-9-2 through 3-9-13 . . . . .	3/29/18
4-5-1 . . . . .	10/12/17	4-5-1 . . . . .	10/12/17
4-5-2 . . . . .	10/12/17	4-5-2 . . . . .	3/29/18
4-6-3 . . . . .	10/12/17	4-6-3 . . . . .	3/29/18
5-2-3 . . . . .	10/12/17	5-2-3 . . . . .	10/12/17
5-2-4 through 5-2-9 . . . . .	10/12/17	5-2-4 through 5-2-10 . . . . .	3/29/18
5-4-3 . . . . .	10/12/17	5-4-3 . . . . .	10/12/17
5-4-4 . . . . .	5/26/16	5-4-4 . . . . .	3/29/18
5-4-5 and 5-4-6 . . . . .	10/12/17	5-4-5 and 5-4-6 . . . . .	3/29/18
5-9-3 . . . . .	10/12/17	5-9-3 . . . . .	3/29/18
5-9-4 . . . . .	10/12/17	5-9-4 . . . . .	10/12/17
5-9-7 and 5-9-8 . . . . .	10/12/17	5-9-7 and 5-9-8 . . . . .	3/29/18
7-4-1 . . . . .	10/12/17	7-4-1 . . . . .	10/12/17
7-4-2 through 7-4-4 . . . . .	10/12/17	7-4-2 through 7-4-4 . . . . .	3/29/18
8-1-1 . . . . .	10/12/17	8-1-1 . . . . .	3/29/18
8-1-2 . . . . .	10/12/17	8-1-2 . . . . .	10/12/17
9-2-3 . . . . .	10/12/17	9-2-3 . . . . .	10/12/17
9-2-4 and 9-2-5 . . . . .	10/12/17	9-2-4 and 9-2-5 . . . . .	3/29/18
9-2-6 . . . . .	10/12/17	9-2-6 . . . . .	10/12/17
9-2-9 through 9-2-11 . . . . .	10/12/17	9-2-9 through 9-2-11 . . . . .	3/29/18
10-2-5 . . . . .	10/12/17	10-2-5 . . . . .	10/12/17
10-2-6 and 10-2-7 . . . . .	10/12/17	10-2-6 and 10-2-7 . . . . .	3/29/18
11-1-1 and 11-1-2 . . . . .	10/12/17	11-1-1 and 11-1-2 . . . . .	3/29/18
13-1-1 . . . . .	10/12/17	13-1-1 . . . . .	10/12/17
13-1-2 . . . . .	10/12/17	13-1-2 . . . . .	3/29/18
Appendix B-1 . . . . .	10/12/17	Appendix B-1 . . . . .	10/12/17
Appendix B-2 . . . . .	10/12/17	Appendix B-2 . . . . .	3/29/18

PCG-1 through PCG W-2 . . . . .	10/12/17	PCG-1 through PCG W-2 . . . . .	3/29/18
I-1 through I-13 . . . . .	10/12/17	I-1 through I-12 . . . . .	3/29/18

# Table of Contents

## Chapter 1. General

### Section 1. Introduction

Paragraph	Page
1-1-1. PURPOSE OF THIS ORDER .....	1-1-1
1-1-2. AUDIENCE .....	1-1-1
1-1-3. WHERE TO FIND THIS ORDER .....	1-1-1
1-1-4. WHAT THIS ORDER CANCELS .....	1-1-1
1-1-5. EXPLANATION OF CHANGES .....	1-1-1
1-1-6. SUBMISSION CUTOFF AND EFFECTIVE DATES .....	1-1-1
1-1-7. DELIVERY DATES .....	1-1-1
1-1-8. RECOMMENDATIONS FOR PROCEDURAL CHANGES .....	1-1-1
1-1-9. REQUESTS FOR INTERPRETATIONS OR CLARIFICATIONS TO THIS ORDER .....	1-1-2
1-1-10. PROCEDURAL LETTERS OF AGREEMENT (LOA) .....	1-1-2
1-1-11. CONSTRAINTS GOVERNING SUPPLEMENTS AND PROCEDURAL DEVIATIONS .....	1-1-2
1-1-12. SAFETY MANAGEMENT SYSTEM (SMS) .....	1-1-3
1-1-13. REFERENCES TO FAA NON-AIR TRAFFIC ORGANIZATIONS .....	1-1-3
1-1-14. DISTRIBUTION .....	1-1-3

### Section 2. Terms of Reference

1-2-1. WORD MEANINGS .....	1-2-1
1-2-2. COURSE DEFINITIONS .....	1-2-2
1-2-3. NOTES .....	1-2-2
1-2-4. REFERENCES .....	1-2-3
1-2-5. ANNOTATIONS .....	1-2-3
1-2-6. ABBREVIATIONS .....	1-2-3

## Chapter 2. General Control

### Section 1. General

2-1-1. ATC SERVICE .....	2-1-1
2-1-2. DUTY PRIORITY .....	2-1-1
2-1-3. PROCEDURAL PREFERENCE .....	2-1-2
2-1-4. OPERATIONAL PRIORITY .....	2-1-2
2-1-5. EXPEDITIOUS COMPLIANCE .....	2-1-4
2-1-6. SAFETY ALERT .....	2-1-4
2-1-7. INFLIGHT EQUIPMENT MALFUNCTIONS .....	2-1-4
2-1-8. MINIMUM FUEL .....	2-1-5
2-1-9. REPORTING ESSENTIAL FLIGHT INFORMATION .....	2-1-5
2-1-10. NAVAID MALFUNCTIONS .....	2-1-5
2-1-11. USE OF MARSA .....	2-1-6
2-1-12. MILITARY PROCEDURES .....	2-1-6
2-1-13. FORMATION FLIGHTS .....	2-1-6
2-1-14. COORDINATE USE OF AIRSPACE .....	2-1-7
2-1-15. CONTROL TRANSFER .....	2-1-7

<b>Paragraph</b>	<b>Page</b>
2-1-16. SURFACE AREAS .....	2-1-7
2-1-17. RADIO COMMUNICATIONS .....	2-1-8
2-1-18. OPERATIONAL REQUESTS .....	2-1-9
2-1-19. WAKE TURBULENCE .....	2-1-9
2-1-20. WAKE TURBULENCE CAUTIONARY ADVISORIES .....	2-1-10
2-1-21. TRAFFIC ADVISORIES .....	2-1-10
2-1-22. UNMANNED AIRCRAFT SYSTEM (UAS) ACTIVITY INFORMATION. ....	2-1-11
2-1-23. BIRD ACTIVITY INFORMATION .....	2-1-12
2-1-24. TRANSFER OF POSITION RESPONSIBILITY .....	2-1-12
2-1-25. WHEELS DOWN CHECK .....	2-1-12
2-1-26. SUPERVISORY NOTIFICATION .....	2-1-12
2-1-27. PILOT DEVIATION NOTIFICATION .....	2-1-12
2-1-28. TCAS RESOLUTION ADVISORIES .....	2-1-12
2-1-29. RVSM OPERATIONS .....	2-1-13
2-1-30. TERRAIN AWARENESS WARNING SYSTEM (TAWS) ALERTS .....	2-1-14
2-1-31. "BLUE LIGHTNING" EVENTS .....	2-1-14

## **Section 2. Flight Plans and Control Information**

2-2-1. RECORDING INFORMATION .....	2-2-1
2-2-2. FORWARDING INFORMATION .....	2-2-1
2-2-3. FORWARDING VFR DATA .....	2-2-1
2-2-4. MILITARY DVFR DEPARTURES .....	2-2-1
2-2-5. IFR TO VFR FLIGHT PLAN CHANGE .....	2-2-1
2-2-6. IFR FLIGHT PROGRESS DATA .....	2-2-1
2-2-7. MANUAL INPUT OF COMPUTER-ASSIGNED BEACON CODES .....	2-2-2
2-2-8. ALTRV INFORMATION .....	2-2-2
2-2-9. COMPUTER MESSAGE VERIFICATION .....	2-2-2
2-2-10. TRANSMIT PROPOSED FLIGHT PLAN .....	2-2-3
2-2-11. FORWARDING AMENDED AND UTM DATA .....	2-2-3
2-2-12. AIRBORNE MILITARY FLIGHTS .....	2-2-4
2-2-13. FORWARDING FLIGHT PLAN DATA BETWEEN U.S. ARTCCs AND CANADIAN ACCs .....	2-2-4
2-2-14. TELETYPE FLIGHT DATA FORMAT- U.S. ARTCCs - CANADIAN ACCs ....	2-2-4
2-2-15. NORTH AMERICAN ROUTE PROGRAM (NRP) INFORMATION .....	2-2-5

## **Section 3. Flight Progress Strips**

2-3-1. GENERAL .....	2-3-1
2-3-2. EN ROUTE DATA ENTRIES .....	2-3-3
2-3-3. OCEANIC DATA ENTRIES .....	2-3-5
2-3-4. TERMINAL DATA ENTRIES .....	2-3-6
2-3-5. AIRCRAFT IDENTITY .....	2-3-9
2-3-6. AIRCRAFT TYPE .....	2-3-10
2-3-7. USAF/USN UNDERGRADUATE PILOTS .....	2-3-10
2-3-8. AIRCRAFT EQUIPMENT SUFFIX .....	2-3-10
2-3-9. CLEARANCE STATUS .....	2-3-10
2-3-10. CONTROL SYMBOLOGY .....	2-3-12

## **Section 4. Radio and Interphone Communications**

2-4-1. RADIO COMMUNICATIONS .....	2-4-1
-----------------------------------	-------



<b>Paragraph</b>	<b>Page</b>
2-4-2. MONITORING .....	2-4-1
2-4-3. PILOT ACKNOWLEDGMENT/READ BACK .....	2-4-1
2-4-4. AUTHORIZED INTERRUPTIONS .....	2-4-1
2-4-5. AUTHORIZED TRANSMISSIONS .....	2-4-1
2-4-6. FALSE OR DECEPTIVE COMMUNICATIONS .....	2-4-2
2-4-7. AUTHORIZED RELAYS .....	2-4-2
2-4-8. RADIO MESSAGE FORMAT .....	2-4-2
2-4-9. ABBREVIATED TRANSMISSIONS .....	2-4-2
2-4-10. INTERPHONE TRANSMISSION PRIORITIES .....	2-4-2
2-4-11. PRIORITY INTERRUPTION .....	2-4-3
2-4-12. INTERPHONE MESSAGE FORMAT .....	2-4-3
2-4-13. INTERPHONE MESSAGE TERMINATION .....	2-4-4
2-4-14. WORDS AND PHRASES .....	2-4-4
2-4-15. EMPHASIS FOR CLARITY .....	2-4-4
2-4-16. ICAO PHONETICS .....	2-4-5
2-4-17. NUMBERS USAGE .....	2-4-5
2-4-18. NUMBER CLARIFICATION .....	2-4-7
2-4-19. FACILITY IDENTIFICATION .....	2-4-8
2-4-20. AIRCRAFT IDENTIFICATION .....	2-4-8
2-4-21. DESCRIPTION OF AIRCRAFT TYPES .....	2-4-11
2-4-22. AIRSPACE CLASSES .....	2-4-11

### **Section 5. Route and NAVAID Description**

2-5-1. AIR TRAFFIC SERVICE (ATS) ROUTES .....	2-5-1
2-5-2. NAVAID TERMS .....	2-5-1
2-5-3. NAVAID FIXES .....	2-5-2

### **Section 6. Weather Information**

2-6-1. FAMILIARIZATION .....	2-6-1
2-6-2. PIREP SOLICITATION AND DISSEMINATION .....	2-6-1
2-6-3. REPORTING WEATHER CONDITIONS .....	2-6-2
2-6-4. ISSUING WEATHER AND CHAFF AREAS .....	2-6-2
2-6-5. DISSEMINATING OFFICIAL WEATHER INFORMATION .....	2-6-5
2-6-6. HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS) .....	2-6-5

### **Section 7. Altimeter Settings**

2-7-1. CURRENT SETTINGS .....	2-7-1
2-7-2. ALTIMETER SETTING ISSUANCE BELOW LOWEST USABLE FL .....	2-7-1

### **Section 8. Runway Visibility Reporting– Terminal**

2-8-1. FURNISH RVR/RVV VALUES .....	2-8-1
2-8-2. ARRIVAL/DEPARTURE RUNWAY VISIBILITY .....	2-8-1
2-8-3. TERMINOLOGY .....	2-8-1

### **Section 9. Automatic Terminal Information Service Procedures**

2-9-1. APPLICATION .....	2-9-1
2-9-2. OPERATING PROCEDURES .....	2-9-1
2-9-3. CONTENT .....	2-9-2

### **Section 10. Team Position Responsibilities**

2-10-1. EN ROUTE OR OCEANIC SECTOR TEAM POSITION RESPONSIBILITIES ..	2-10-1
--	--------

<b>Paragraph</b>	<b>Page</b>
2-10-2. TERMINAL RADAR/NONRADAR TEAM POSITION RESPONSIBILITIES . . .	2-10-2
2-10-3. TOWER TEAM POSITION RESPONSIBILITIES . . . . .	2-10-4

## **Chapter 3. Airport Traffic Control– Terminal**

### **Section 1. General**

3-1-1. PROVIDE SERVICE . . . . .	3-1-1
3-1-2. PREVENTIVE CONTROL . . . . .	3-1-1
3-1-3. USE OF ACTIVE RUNWAYS . . . . .	3-1-1
3-1-4. COORDINATION BETWEEN LOCAL AND GROUND CONTROLLERS . . . . .	3-1-2
3-1-5. VEHICLES/EQUIPMENT/PERSONNEL NEAR/ON RUNWAYS . . . . .	3-1-2
3-1-6. TRAFFIC INFORMATION . . . . .	3-1-2
3-1-7. POSITION DETERMINATION . . . . .	3-1-3
3-1-8. LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES . . . . .	3-1-3
3-1-9. USE OF TOWER RADAR DISPLAYS . . . . .	3-1-5
3-1-10. OBSERVED ABNORMALITIES . . . . .	3-1-5
3-1-11. SURFACE AREA RESTRICTIONS . . . . .	3-1-6
3-1-12. VISUALLY SCANNING RUNWAYS . . . . .	3-1-6
3-1-13. ESTABLISHING TWO-WAY COMMUNICATIONS . . . . .	3-1-6
3-1-14. GROUND OPERATIONS WHEN VOLCANIC ASH IS PRESENT . . . . .	3-1-6
3-1-15. GROUND OPERATIONS RELATED TO THREE/FOUR-HOUR TARMAC RULE . . . . .	3-1-6

### **Section 2. Visual Signals**

3-2-1. LIGHT SIGNALS . . . . .	3-2-1
3-2-2. WARNING SIGNAL . . . . .	3-2-1
3-2-3. RECEIVER-ONLY ACKNOWLEDGMENT . . . . .	3-2-1

### **Section 3. Airport Conditions**

3-3-1. LANDING AREA CONDITION . . . . .	3-3-1
3-3-2. CLOSED/UNSAFE RUNWAY INFORMATION . . . . .	3-3-1
3-3-3. TIMELY INFORMATION . . . . .	3-3-2
3-3-4. BRAKING ACTION . . . . .	3-3-2
3-3-5. BRAKING ACTION ADVISORIES . . . . .	3-3-2
3-3-6. ARRESTING SYSTEM OPERATION . . . . .	3-3-3
3-3-7. FAR FIELD MONITOR (FFM) REMOTE STATUS UNIT . . . . .	3-3-4

### **Section 4. Airport Lighting**

3-4-1. EMERGENCY LIGHTING . . . . .	3-4-1
3-4-2. RUNWAY END IDENTIFIER LIGHTS (REIL) . . . . .	3-4-1
3-4-3. VISUAL APPROACH SLOPE INDICATORS (VASI) . . . . .	3-4-1
3-4-4. PRECISION APPROACH PATH INDICATORS (PAPI) . . . . .	3-4-1
3-4-5. APPROACH LIGHTS . . . . .	3-4-2
3-4-6. ALS INTENSITY SETTINGS . . . . .	3-4-2
3-4-7. SEQUENCED FLASHING LIGHTS (SFL) . . . . .	3-4-2
3-4-8. MALSR/ODALS . . . . .	3-4-2
3-4-9. ALSF-2/SSALR . . . . .	3-4-3
3-4-10. RUNWAY EDGE LIGHTS . . . . .	3-4-3
3-4-11. HIGH INTENSITY RUNWAY, RUNWAY CENTERLINE, AND TOUCHDOWN ZONE LIGHTS . . . . .	3-4-4

<b>Paragraph</b>	<b>Page</b>
3-4-12. HIRL ASSOCIATED WITH MALSR .....	3-4-4
3-4-13. HIRL CHANGES AFFECTING RVR .....	3-4-4
3-4-14. MEDIUM INTENSITY RUNWAY LIGHTS (MIRL) .....	3-4-4
3-4-15. HIGH SPEED TURNOFF LIGHTS .....	3-4-5
3-4-16. TAXIWAY LIGHTS .....	3-4-5
3-4-17. OBSTRUCTION LIGHTS .....	3-4-5
3-4-18. ROTATING BEACON .....	3-4-5
3-4-19. RUNWAY STATUS LIGHTS (RWSL) .....	3-4-5

### **Section 5. Runway Selection**

3-5-1. SELECTION .....	3-5-1
3-5-2. STOL RUNWAYS .....	3-5-1
3-5-3. TAILWIND COMPONENTS .....	3-5-1

### **Section 6. Airport Surface Detection Procedures**

3-6-1. EQUIPMENT USAGE .....	3-6-1
3-6-2. IDENTIFICATION .....	3-6-1
3-6-3. INFORMATION USAGE .....	3-6-1
3-6-4. SAFETY LOGIC ALERT RESPONSES .....	3-6-1
3-6-5. RADAR-ONLY MODE .....	3-6-2

### **Section 7. Taxi and Ground Movement Procedures**

3-7-1. GROUND TRAFFIC MOVEMENT .....	3-7-1
3-7-2. TAXI AND GROUND MOVEMENT OPERATIONS .....	3-7-2
3-7-3. GROUND OPERATIONS .....	3-7-5
3-7-4. RUNWAY PROXIMITY .....	3-7-5
3-7-5. PRECISION APPROACH CRITICAL AREA .....	3-7-5
3-7-6. PRECISION OBSTACLE FREE ZONE (POFZ) AND FINAL APPROACH OBSTACLE CLEARANCE SURFACES (OCS) .....	3-7-6

### **Section 8. Spacing and Sequencing**

3-8-1. SEQUENCE/SPACING APPLICATION .....	3-8-1
3-8-2. TOUCH-AND-GO OR STOP-AND-GO OR LOW APPROACH .....	3-8-1
3-8-3. SIMULTANEOUS SAME DIRECTION OPERATION .....	3-8-1
3-8-4. SIMULTANEOUS OPPOSITE DIRECTION OPERATION .....	3-8-2

### **Section 9. Departure Procedures and Separation**

3-9-1. DEPARTURE INFORMATION .....	3-9-1
3-9-2. DEPARTURE DELAY INFORMATION .....	3-9-1
3-9-3. DEPARTURE CONTROL INSTRUCTIONS .....	3-9-2
3-9-4. LINE UP AND WAIT (LUAW) .....	3-9-2
3-9-5. ANTICIPATING SEPARATION .....	3-9-4
3-9-6. SAME RUNWAY SEPARATION .....	3-9-4
3-9-7. WAKE TURBULENCE SEPARATION FOR INTERSECTION DEPARTURES ....	3-9-7
3-9-8. INTERSECTING RUNWAY/INTERSECTING FLIGHT PATH OPERATIONS ....	3-9-9
3-9-9. NONINTERSECTING CONVERGING RUNWAY OPERATIONS .....	3-9-10
3-9-10. TAKEOFF CLEARANCE .....	3-9-12
3-9-11. CANCELLATION OF TAKEOFF CLEARANCE .....	3-9-13

### **Section 10. Arrival Procedures and Separation**

3-10-1. LANDING INFORMATION .....	3-10-1
-----------------------------------	--------

<b>Paragraph</b>	<b>Page</b>
3-10-2. FORWARDING APPROACH INFORMATION BY NONAPPROACH CONTROL FACILITIES .....	3-10-1
3-10-3. SAME RUNWAY SEPARATION .....	3-10-2
3-10-4. INTERSECTING RUNWAY/INTERSECTING FLIGHT PATH SEPARATION ...	3-10-3
3-10-5. LANDING CLEARANCE .....	3-10-6
3-10-6. ANTICIPATING SEPARATION .....	3-10-7
3-10-7. LANDING CLEARANCE WITHOUT VISUAL OBSERVATION .....	3-10-7
3-10-8. WITHHOLDING LANDING CLEARANCE .....	3-10-8
3-10-9. RUNWAY EXITING .....	3-10-8
3-10-10. ALTITUDE RESTRICTED LOW APPROACH .....	3-10-8
3-10-11. CLOSED TRAFFIC .....	3-10-9
3-10-12. OVERHEAD MANEUVER .....	3-10-9
3-10-13. SIMULATED FLAMEOUT (SFO) APPROACHES/EMERGENCY LANDING PATTERN (ELP) OPERATIONS/PRACTICE PRECAUTIONARY APPROACHES .....	3-10-10

### **Section 11. Helicopter Operations**

3-11-1. TAXI AND GROUND MOVEMENT OPERATION .....	3-11-1
3-11-2. HELICOPTER TAKEOFF CLEARANCE .....	3-11-1
3-11-3. HELICOPTER DEPARTURE SEPARATION .....	3-11-2
3-11-4. HELICOPTER ARRIVAL SEPARATION .....	3-11-3
3-11-5. SIMULTANEOUS LANDINGS OR TAKEOFFS .....	3-11-3
3-11-6. HELICOPTER LANDING CLEARANCE .....	3-11-4

### **Section 12. Sea Lane Operations**

3-12-1. APPLICATION .....	3-12-1
3-12-2. DEPARTURE SEPARATION .....	3-12-1
3-12-3. ARRIVAL SEPARATION .....	3-12-1

## **Chapter 4. IFR**

### **Section 1. NAVAID Use Limitations**

4-1-1. ALTITUDE AND DISTANCE LIMITATIONS .....	4-1-1
4-1-2. EXCEPTIONS .....	4-1-1
4-1-3. CROSSING ALTITUDE .....	4-1-2
4-1-4. VFR-ON-TOP .....	4-1-2
4-1-5. FIX USE .....	4-1-2

### **Section 2. Clearances**

4-2-1. CLEARANCE ITEMS .....	4-2-1
4-2-2. CLEARANCE PREFIX .....	4-2-1
4-2-3. DELIVERY INSTRUCTIONS .....	4-2-1
4-2-4. CLEARANCE RELAY .....	4-2-1
4-2-5. ROUTE OR ALTITUDE AMENDMENTS .....	4-2-1
4-2-6. THROUGH CLEARANCES .....	4-2-3
4-2-7. ALTRV CLEARANCE .....	4-2-3
4-2-8. IFR-VFR AND VFR-IFR FLIGHTS .....	4-2-3
4-2-9. CLEARANCE ITEMS .....	4-2-3
4-2-10. CANCELLATION OF IFR FLIGHT PLAN .....	4-2-4

### Section 3. Departure Procedures

Paragraph	Page
4-3-1. DEPARTURE TERMINOLOGY .....	4-3-1
4-3-2. DEPARTURE CLEARANCES .....	4-3-1
4-3-3. ABBREVIATED DEPARTURE CLEARANCE .....	4-3-4
4-3-4. DEPARTURE RESTRICTIONS, CLEARANCE VOID TIMES, HOLD FOR RELEASE, AND RELEASE TIMES .....	4-3-6
4-3-5. GROUND STOP .....	4-3-8
4-3-6. DELAY SEQUENCING .....	4-3-8
4-3-7. FORWARD DEPARTURE DELAY INFORMATION .....	4-3-8
4-3-8. COORDINATION WITH RECEIVING FACILITY .....	4-3-8
4-3-9. VFR RELEASE OF IFR DEPARTURE .....	4-3-8
4-3-10. FORWARDING DEPARTURE TIMES .....	4-3-9

### Section 4. Route Assignment

4-4-1. ROUTE USE .....	4-4-1
4-4-2. ROUTE STRUCTURE TRANSITIONS .....	4-4-2
4-4-3. DEGREE-DISTANCE ROUTE DEFINITION FOR MILITARY OPERATIONS ....	4-4-3
4-4-4. ALTERNATIVE ROUTES .....	4-4-3
4-4-5. CLASS G AIRSPACE .....	4-4-3
4-4-6. DIRECT CLEARANCES .....	4-4-4

### Section 5. Altitude Assignment and Verification

4-5-1. VERTICAL SEPARATION MINIMA .....	4-5-1
4-5-2. FLIGHT DIRECTION .....	4-5-1
4-5-3. EXCEPTIONS .....	4-5-1
4-5-4. LOWEST USABLE FLIGHT LEVEL .....	4-5-2
4-5-5. ADJUSTED MINIMUM FLIGHT LEVEL .....	4-5-2
4-5-6. MINIMUM EN ROUTE ALTITUDES (MEA) .....	4-5-2
4-5-7. ALTITUDE INFORMATION .....	4-5-3
4-5-8. ANTICIPATED ALTITUDE CHANGES .....	4-5-8
4-5-9. ALTITUDE CONFIRMATION- NONRADAR .....	4-5-8

### Section 6. Holding Aircraft

4-6-1. CLEARANCE TO HOLDING FIX .....	4-6-1
4-6-2. CLEARANCE BEYOND FIX .....	4-6-2
4-6-3. DELAYS .....	4-6-2
4-6-4. HOLDING INSTRUCTIONS .....	4-6-3
4-6-5. VISUAL HOLDING POINTS .....	4-6-3
4-6-6. HOLDING FLIGHT PATH DEVIATION .....	4-6-3
4-6-7. UNMONITORED NAVAIDS .....	4-6-3
4-6-8. ILS PROTECTION/CRITICAL AREAS .....	4-6-3

### Section 7. Arrival Procedures

4-7-1. CLEARANCE INFORMATION .....	4-7-1
4-7-2. ADVANCE DESCENT CLEARANCE .....	4-7-1
4-7-3. SINGLE FREQUENCY APPROACHES (SFA) .....	4-7-1
4-7-4. RADIO FREQUENCY AND RADAR BEACON CHANGES FOR MILITARY AIRCRAFT .....	4-7-2
4-7-5. MILITARY TURBOJET EN ROUTE DESCENT .....	4-7-2

<b>Paragraph</b>	<b>Page</b>
4-7-6. ARRIVAL INFORMATION .....	4-7-3
4-7-7. WEATHER INFORMATION .....	4-7-3
4-7-8. BELOW MINIMA REPORT BY PILOT .....	4-7-4
4-7-9. TRANSFER OF JURISDICTION .....	4-7-4
4-7-10. APPROACH INFORMATION .....	4-7-4
4-7-11. ARRIVAL INFORMATION BY APPROACH CONTROL FACILITIES .....	4-7-5
4-7-12. AIRPORT CONDITIONS .....	4-7-5
4-7-13. SWITCHING ILS RUNWAYS .....	4-7-6

## **Section 8. Approach Clearance Procedures**

4-8-1. APPROACH CLEARANCE .....	4-8-1
4-8-2. CLEARANCE LIMIT .....	4-8-7
4-8-3. RELAYED APPROACH CLEARANCE .....	4-8-7
4-8-4. ALTITUDE ASSIGNMENT FOR MILITARY HIGH ALTITUDE INSTRUMENT APPROACHES .....	4-8-7
4-8-5. SPECIFYING ALTITUDE .....	4-8-7
4-8-6. CIRCLING APPROACH .....	4-8-7
4-8-7. SIDE-STEP MANEUVER .....	4-8-7
4-8-8. COMMUNICATIONS RELEASE .....	4-8-8
4-8-9. MISSED APPROACH .....	4-8-8
4-8-10. APPROACH INFORMATION .....	4-8-8
4-8-11. PRACTICE APPROACHES .....	4-8-8
4-8-12. LOW APPROACH AND TOUCH-AND-GO .....	4-8-9

## **Chapter 5. Radar**

### **Section 1. General**

5-1-1. PRESENTATION AND EQUIPMENT PERFORMANCE .....	5-1-1
5-1-2. ALIGNMENT ACCURACY CHECK .....	5-1-1
5-1-3. ATC SURVEILLANCE SOURCE USE .....	5-1-1
5-1-4. BEACON RANGE ACCURACY .....	5-1-2
5-1-5. ELECTRONIC ATTACK (EA) ACTIVITY .....	5-1-2
5-1-6. SERVICE LIMITATIONS .....	5-1-3
5-1-7. ELECTRONIC CURSOR .....	5-1-3
5-1-8. MERGING TARGET PROCEDURES .....	5-1-3
5-1-9. HOLDING PATTERN SURVEILLANCE .....	5-1-4
5-1-10. DEVIATION ADVISORIES .....	5-1-4
5-1-11. RADAR FIX POSTING .....	5-1-4
5-1-12. POSITION REPORTING .....	5-1-4
5-1-13. RADAR SERVICE TERMINATION .....	5-1-4

### **Section 2. Beacon Systems**

5-2-1. ASSIGNMENT CRITERIA .....	5-2-1
5-2-2. DISCRETE ENVIRONMENT .....	5-2-1
5-2-3. NONDISCRETE ENVIRONMENT .....	5-2-1
5-2-4. MIXED ENVIRONMENT .....	5-2-1
5-2-5. RADAR BEACON CODE CHANGES .....	5-2-2
5-2-6. FUNCTION CODE ASSIGNMENTS .....	5-2-2
5-2-7. EMERGENCY CODE ASSIGNMENT .....	5-2-3

<b>Paragraph</b>	<b>Page</b>
5-2-8. RADIO FAILURE .....	5-2-3
5-2-9. UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK .....	5-2-3
5-2-10. VFR CODE ASSIGNMENTS .....	5-2-4
5-2-11. BEACON CODE FOR PRESSURE SUIT FLIGHTS AND FLIGHTS ABOVE FL 600 .....	5-2-5
5-2-12. AIR DEFENSE EXERCISE BEACON CODE ASSIGNMENT .....	5-2-5
5-2-13. STANDBY OR LOW SENSITIVITY OPERATION .....	5-2-5
5-2-14. CODE MONITOR .....	5-2-5
5-2-15. FAILURE TO DISPLAY ASSIGNED BEACON CODE OR INOPERATIVE/ MALFUNCTIONING TRANSPONDER .....	5-2-6
5-2-16. INOPERATIVE OR MALFUNCTIONING INTERROGATOR .....	5-2-6
5-2-17. FAILED TRANSPONDER IN CLASS A AIRSPACE .....	5-2-6
5-2-18. VALIDATION OF MODE C READOUT .....	5-2-6
5-2-19. ALTITUDE CONFIRMATION- MODE C .....	5-2-7
5-2-20. ALTITUDE CONFIRMATION- NON-MODE C .....	5-2-8
5-2-21. AUTOMATIC ALTITUDE REPORTING .....	5-2-8
5-2-22. INFLIGHT DEVIATIONS FROM TRANSPONDER/MODE C REQUIREMENTS BETWEEN 10,000 FEET AND 18,000 FEET .....	5-2-8
5-2-23. BEACON TERMINATION .....	5-2-9
5-2-24. ALTITUDE FILTERS .....	5-2-9
5-2-25. INOPERATIVE OR MALFUNCTIONING ADS-B TRANSMITTER .....	5-2-9
5-2-26. ADS-B ALERTS .....	5-2-9

### **Section 3. Radar Identification**

5-3-1. APPLICATION .....	5-3-1
5-3-2. PRIMARY RADAR IDENTIFICATION METHODS .....	5-3-1
5-3-3. BEACON IDENTIFICATION METHODS .....	5-3-1
5-3-4. TERMINAL AUTOMATION SYSTEMS IDENTIFICATION METHODS .....	5-3-2
5-3-5. QUESTIONABLE IDENTIFICATION .....	5-3-2
5-3-6. POSITION INFORMATION .....	5-3-2
5-3-7. IDENTIFICATION STATUS .....	5-3-2
5-3-8. TARGET MARKERS .....	5-3-3
5-3-9. TARGET MARKERS .....	5-3-3

### **Section 4. Transfer of Radar Identification**

5-4-1. APPLICATION .....	5-4-1
5-4-2. TERMS .....	5-4-1
5-4-3. METHODS .....	5-4-1
5-4-4. TRAFFIC .....	5-4-2
5-4-5. TRANSFERRING CONTROLLER HANDOFF .....	5-4-2
5-4-6. RECEIVING CONTROLLER HANDOFF .....	5-4-3
5-4-7. POINT OUT .....	5-4-4
5-4-8. AUTOMATED INFORMATION TRANSFER (AIT) .....	5-4-5
5-4-9. PREARRANGED COORDINATION .....	5-4-5
5-4-10. EN ROUTE FOURTH LINE DATA BLOCK USAGE .....	5-4-5

### **Section 5. Radar Separation**

5-5-1. APPLICATION .....	5-5-1
5-5-2. TARGET SEPARATION .....	5-5-1

<b>Paragraph</b>	<b>Page</b>
5-5-3. TARGET RESOLUTION .....	5-5-2
5-5-4. MINIMA .....	5-5-2
5-5-5. VERTICAL APPLICATION .....	5-5-5
5-5-6. EXCEPTIONS .....	5-5-5
5-5-7. PASSING OR DIVERGING .....	5-5-5
5-5-8. ADDITIONAL SEPARATION FOR FORMATION FLIGHTS .....	5-5-6
5-5-9. SEPARATION FROM OBSTRUCTIONS .....	5-5-7
5-5-10. ADJACENT AIRSPACE .....	5-5-7
5-5-11. EDGE OF SCOPE .....	5-5-7
5-5-12. BEACON TARGET DISPLACEMENT .....	5-5-8

### **Section 6. Vectoring**

5-6-1. APPLICATION .....	5-6-1
5-6-2. METHODS .....	5-6-1
5-6-3. VECTORS BELOW MINIMUM ALTITUDE .....	5-6-2

### **Section 7. Speed Adjustment**

5-7-1. APPLICATION .....	5-7-1
5-7-2. METHODS .....	5-7-2
5-7-3. SPEED ASSIGNMENTS .....	5-7-3
5-7-4. TERMINATION .....	5-7-4

### **Section 8. Radar Departures**

5-8-1. PROCEDURES .....	5-8-1
5-8-2. INITIAL HEADING .....	5-8-1
5-8-3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES .....	5-8-1
5-8-4. DEPARTURE AND ARRIVAL .....	5-8-3
5-8-5. DEPARTURES AND ARRIVALS ON PARALLEL OR NONINTERSECTING DIVERGING RUNWAYS .....	5-8-3

### **Section 9. Radar Arrivals**

5-9-1. VECTORS TO FINAL APPROACH COURSE .....	5-9-1
5-9-2. FINAL APPROACH COURSE INTERCEPTION .....	5-9-1
5-9-3. VECTORS ACROSS FINAL APPROACH COURSE .....	5-9-2
5-9-4. ARRIVAL INSTRUCTIONS .....	5-9-2
5-9-5. APPROACH SEPARATION RESPONSIBILITY .....	5-9-4
5-9-6. SIMULTANEOUS DEPENDENT APPROACHES .....	5-9-5
5-9-7. SIMULTANEOUS INDEPENDENT APPROACHES- DUAL & TRIPLE .....	5-9-6
5-9-8. SIMULTANEOUS INDEPENDENT CLOSE PARALLEL APPROACHES -PRECISION RUNWAY MONITOR (PRM) APPROACHES .....	5-9-8
5-9-9. SIMULTANEOUS OFFSET INSTRUMENT APPROACHES (SOIA)- HIGH UPDATE RADAR .....	5-9-9
5-9-10. SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY-SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS .....	5-9-12
5-9-11. TRANSITIONAL PROCEDURE .....	5-9-13

### **Section 10. Radar Approaches- Terminal**

5-10-1. APPLICATION .....	5-10-1
5-10-2. APPROACH INFORMATION .....	5-10-1
5-10-3. NO-GYRO APPROACH .....	5-10-2



<b>Paragraph</b>	<b>Page</b>
5-10-4. LOST COMMUNICATIONS .....	5-10-2
5-10-5. RADAR CONTACT LOST .....	5-10-3
5-10-6. LANDING CHECK .....	5-10-3
5-10-7. POSITION INFORMATION .....	5-10-3
5-10-8. FINAL CONTROLLER CHANGEOVER .....	5-10-3
5-10-9. COMMUNICATIONS CHECK .....	5-10-4
5-10-10. TRANSMISSION ACKNOWLEDGMENT .....	5-10-4
5-10-11. MISSED APPROACH .....	5-10-4
5-10-12. LOW APPROACH AND TOUCH-AND-GO .....	5-10-4
5-10-13. TOWER CLEARANCE .....	5-10-4
5-10-14. FINAL APPROACH ABNORMALITIES .....	5-10-5
5-10-15. MILITARY SINGLE FREQUENCY APPROACHES .....	5-10-5

### **Section 11. Surveillance Approaches– Terminal**

5-11-1. ALTITUDE INFORMATION .....	5-11-1
5-11-2. VISUAL REFERENCE REPORT .....	5-11-1
5-11-3. DESCENT NOTIFICATION .....	5-11-1
5-11-4. DESCENT INSTRUCTIONS .....	5-11-1
5-11-5. FINAL APPROACH GUIDANCE .....	5-11-1
5-11-6. APPROACH GUIDANCE TERMINATION .....	5-11-2

### **Section 12. PAR Approaches– Terminal**

5-12-1. GLIDEPATH NOTIFICATION .....	5-12-1
5-12-2. DECISION HEIGHT (DH) NOTIFICATION .....	5-12-1
5-12-3. DESCENT INSTRUCTION .....	5-12-1
5-12-4. GLIDEPATH AND COURSE INFORMATION .....	5-12-1
5-12-5. DISTANCE FROM TOUCHDOWN .....	5-12-1
5-12-6. DECISION HEIGHT .....	5-12-1
5-12-7. POSITION ADVISORIES .....	5-12-1
5-12-8. APPROACH GUIDANCE TERMINATION .....	5-12-2
5-12-9. COMMUNICATION TRANSFER .....	5-12-2
5-12-10. ELEVATION FAILURE .....	5-12-2
5-12-11. SURVEILLANCE UNUSABLE .....	5-12-3

### **Section 13. Use of PAR for Approach Monitoring– Terminal**

5-13-1. MONITOR ON PAR EQUIPMENT .....	5-13-1
5-13-2. MONITOR AVAILABILITY .....	5-13-1
5-13-3. MONITOR INFORMATION .....	5-13-1

### **Section 14. Automation– En Route**

5-14-1. CONFLICT ALERT (CA) AND MODE C INTRUDER (MCI) ALERT .....	5-14-1
5-14-2. EN ROUTE MINIMUM SAFE ALTITUDE WARNING (E-MSAW) .....	5-14-1
5-14-3. COMPUTER ENTRY OF FLIGHT PLAN INFORMATION .....	5-14-2
5-14-4. ENTRY OF REPORTED ALTITUDE .....	5-14-2
5-14-5. SELECTED ALTITUDE LIMITS .....	5-14-2
5-14-6. SECTOR ELIGIBILITY .....	5-14-2
5-14-7. COAST TRACKS .....	5-14-3
5-14-8. CONTROLLER INITIATED COAST TRACKS .....	5-14-3
5-14-9. ERAM COMPUTER ENTRY OF HOLD INFORMATION .....	5-14-3

<b>Paragraph</b>	<b>Page</b>
5-14-10. ERAM VISUAL INDICATOR OF SPECIAL ACTIVITY AIRSPACE (SAA) STATUS .....	5-14-3

### **Section 15. Common Automated Radar Terminal Systems (CARTS) & Standard Terminal Automation Replacement System (STARS)-Terminal**

5-15-1. APPLICATION .....	5-15-1
5-15-2. RESPONSIBILITY .....	5-15-1
5-15-3. FUNCTIONAL USE .....	5-15-1
5-15-4. SYSTEM REQUIREMENTS .....	5-15-1
5-15-5. INFORMATION DISPLAYED .....	5-15-1
5-15-6. CA/MCI .....	5-15-2
5-15-7. INHIBITING MINIMUM SAFE ALTITUDE WARNING (MSAW) .....	5-15-2
5-15-8. TRACK SUSPEND FUNCTION .....	5-15-2

## **Chapter 6. Nonradar**

### **Section 1. General**

6-1-1. DISTANCE .....	6-1-1
6-1-2. NONRECEIPT OF POSITION REPORT .....	6-1-1
6-1-3. DUPLICATE POSITION REPORTS .....	6-1-1
6-1-4. ADJACENT AIRPORT OPERATION .....	6-1-1
6-1-5. ARRIVAL MINIMA .....	6-1-1

### **Section 2. Initial Separation of Successive Departing Aircraft**

6-2-1. MINIMA ON DIVERGING COURSES .....	6-2-1
6-2-2. MINIMA ON SAME COURSE .....	6-2-3

### **Section 3. Initial Separation of Departing and Arriving Aircraft**

6-3-1. SEPARATION MINIMA .....	6-3-1
--------------------------------	-------

### **Section 4. Longitudinal Separation**

6-4-1. APPLICATION .....	6-4-1
6-4-2. MINIMA ON SAME, CONVERGING, OR CROSSING COURSES .....	6-4-1
6-4-3. MINIMA ON OPPOSITE COURSES .....	6-4-5
6-4-4. SEPARATION BY PILOTS .....	6-4-6
6-4-5. RNAV AIRCRAFT ALONG VOR AIRWAYS/ROUTES .....	6-4-6

### **Section 5. Lateral Separation**

6-5-1. SEPARATION METHODS .....	6-5-1
6-5-2. MINIMA ON DIVERGING RADIALS .....	6-5-1
6-5-3. DME ARC MINIMA .....	6-5-2
6-5-4. MINIMA ALONG OTHER THAN ESTABLISHED AIRWAYS OR ROUTES .....	6-5-2
6-5-5. RNAV MINIMA- DIVERGING/CROSSING COURSES .....	6-5-4

### **Section 6. Vertical Separation**

6-6-1. APPLICATION .....	6-6-1
6-6-2. EXCEPTIONS .....	6-6-1

<b>Paragraph</b>	<b>Page</b>
6-6-3. SEPARATION BY PILOTS .....	6-6-1

### **Section 7. Timed Approaches**

6-7-1. APPLICATION .....	6-7-1
6-7-2. APPROACH SEQUENCE .....	6-7-1
6-7-3. SEQUENCE INTERRUPTION .....	6-7-2
6-7-4. LEVEL FLIGHT RESTRICTION .....	6-7-2
6-7-5. INTERVAL MINIMA .....	6-7-2
6-7-6. TIME CHECK .....	6-7-2
6-7-7. MISSED APPROACHES .....	6-7-2

## **Chapter 7. Visual**

### **Section 1. General**

7-1-1. CLASS A AIRSPACE RESTRICTIONS .....	7-1-1
7-1-2. VFR CONDITIONS .....	7-1-1
7-1-3. APPROACH CONTROL SERVICE FOR VFR ARRIVING AIRCRAFT .....	7-1-1
7-1-4. VISUAL HOLDING OF VFR AIRCRAFT .....	7-1-1

### **Section 2. Visual Separation**

7-2-1. VISUAL SEPARATION .....	7-2-1
--------------------------------	-------

### **Section 3. VFR-On-Top**

7-3-1. VFR-ON-TOP .....	7-3-1
7-3-2. ALTITUDE FOR DIRECTION OF FLIGHT .....	7-3-2

### **Section 4. Approaches**

7-4-1. VISUAL APPROACH .....	7-4-1
7-4-2. VECTORS FOR VISUAL APPROACH .....	7-4-1
7-4-3. CLEARANCE FOR VISUAL APPROACH .....	7-4-1
7-4-4. APPROACHES TO MULTIPLE RUNWAYS .....	7-4-2
7-4-5. CHARTED VISUAL FLIGHT PROCEDURES (CVFP). USA/USN NOT APPLICABLE .....	7-4-4
7-4-6. CONTACT APPROACH .....	7-4-4

### **Section 5. Special VFR (SVFR)**

7-5-1. AUTHORIZATION .....	7-5-1
7-5-2. PRIORITY .....	7-5-1
7-5-3. SEPARATION .....	7-5-2
7-5-4. ALTITUDE ASSIGNMENT .....	7-5-2
7-5-5. LOCAL OPERATIONS .....	7-5-3
7-5-6. CLIMB TO VFR .....	7-5-3
7-5-7. GROUND VISIBILITY BELOW 1 MILE .....	7-5-3
7-5-8. FLIGHT VISIBILITY BELOW 1 MILE .....	7-5-4

### **Section 6. Basic Radar Service to VFR Aircraft- Terminal**

7-6-1. APPLICATION .....	7-6-1
7-6-2. SERVICE AVAILABILITY .....	7-6-1

<b>Paragraph</b>	<b>Page</b>
7-6-3. INITIAL CONTACT .....	7-6-1
7-6-4. IDENTIFICATION .....	7-6-1
7-6-5. HOLDING .....	7-6-1
7-6-6. APPROACH SEQUENCE .....	7-6-1
7-6-7. SEQUENCING .....	7-6-1
7-6-8. CONTROL TRANSFER .....	7-6-2
7-6-9. ABANDONED APPROACH .....	7-6-2
7-6-10. VFR DEPARTURE INFORMATION .....	7-6-2
7-6-11. TERMINATION OF SERVICE .....	7-6-2
7-6-12. SERVICE PROVIDED WHEN TOWER IS INOPERATIVE .....	7-6-3

### **Section 7. Terminal Radar Service Area (TRSA)– Terminal**

7-7-1. APPLICATION .....	7-7-1
7-7-2. ISSUANCE OF EFC .....	7-7-1
7-7-3. SEPARATION .....	7-7-1
7-7-4. HELICOPTER TRAFFIC .....	7-7-1
7-7-5. ALTITUDE ASSIGNMENTS .....	7-7-1
7-7-6. APPROACH INTERVAL .....	7-7-1
7-7-7. TRSA DEPARTURE INFORMATION .....	7-7-1

### **Section 8. Class C Service– Terminal**

7-8-1. APPLICATION .....	7-8-1
7-8-2. CLASS C SERVICES .....	7-8-1
7-8-3. SEPARATION .....	7-8-1
7-8-4. ESTABLISHING TWO-WAY COMMUNICATIONS .....	7-8-1
7-8-5. ALTITUDE ASSIGNMENTS .....	7-8-2
7-8-6. EXCEPTIONS .....	7-8-2
7-8-7. ADJACENT AIRPORT OPERATIONS .....	7-8-2
7-8-8. TERMINATION OF SERVICE .....	7-8-2

### **Section 9. Class B Service Area– Terminal**

7-9-1. APPLICATION .....	7-9-1
7-9-2. VFR AIRCRAFT IN CLASS B AIRSPACE .....	7-9-1
7-9-3. METHODS .....	7-9-1
7-9-4. SEPARATION .....	7-9-2
7-9-5. TRAFFIC ADVISORIES .....	7-9-2
7-9-6. HELICOPTER TRAFFIC .....	7-9-2
7-9-7. ALTITUDE ASSIGNMENTS .....	7-9-2
7-9-8. APPROACH INTERVAL .....	7-9-2

## **Chapter 8. Offshore/Oceanic Procedures**

### **Section 1. General**

8-1-1. ATC SERVICE .....	8-1-1
8-1-2. OPERATIONS IN OFFSHORE AIRSPACE AREAS .....	8-1-1
8-1-3. VFR FLIGHT PLANS .....	8-1-1
8-1-4. TYPES OF SEPARATION .....	8-1-1
8-1-5. ALTIMETER SETTING .....	8-1-1

<b>Paragraph</b>	<b>Page</b>
8-1-6. RECEIPT OF POSITION REPORTS .....	8-1-1
8-1-7. OCEANIC ERROR REPORT PROCEDURES .....	8-1-1
8-1-8. USE OF CONTROL ESTIMATES .....	8-1-1
8-1-9. RVSM OPERATIONS .....	8-1-1
<b>Section 2. Coordination</b>	
8-2-1. GENERAL .....	8-2-1
8-2-2. TRANSFER OF CONTROL AND COMMUNICATIONS .....	8-2-1
8-2-3. AIR TRAFFIC SERVICES INTERFACILITY DATA COMMUNICATIONS (AIDC) .....	8-2-1
<b>Section 3. Longitudinal Separation</b>	
8-3-1. APPLICATION .....	8-3-1
8-3-2. SEPARATION METHODS .....	8-3-1
8-3-3. MACH NUMBER TECHNIQUE .....	8-3-2
<b>Section 4. Lateral Separation</b>	
8-4-1. APPLICATION .....	8-4-1
8-4-2. SEPARATION METHODS .....	8-4-1
8-4-3. REDUCTION OF ROUTE PROTECTED AIRSPACE .....	8-4-3
8-4-4. TRACK SEPARATION .....	8-4-4
<b>Section 5. Offshore/Oceanic Transition Procedures</b>	
8-5-1. ALTITUDE/FLIGHT LEVEL TRANSITION .....	8-5-1
8-5-2. COURSE DIVERGENCE .....	8-5-1
8-5-3. OPPOSITE DIRECTION .....	8-5-1
8-5-4. SAME DIRECTION .....	8-5-2
8-5-5. RADAR IDENTIFICATION APPLICATION .....	8-5-2
<b>Section 6. Separation from Airspace Reservations</b>	
8-6-1. TEMPORARY STATIONARY AIRSPACE RESERVATIONS .....	8-6-1
8-6-2. REFUSAL OF AVOIDANCE CLEARANCE .....	8-6-1
8-6-3. TEMPORARY MOVING AIRSPACE RESERVATIONS .....	8-6-1
<b>Section 7. North Atlantic ICAO Region</b>	
8-7-1. APPLICATION .....	8-7-1
8-7-2. VERTICAL SEPARATION .....	8-7-1
8-7-3. LONGITUDINAL SEPARATION .....	8-7-1
8-7-4. LATERAL SEPARATION .....	8-7-3
8-7-5. PROCEDURES FOR WEATHER DEVIATIONS IN NORTH ATLANTIC (NAT) AIRSPACE .....	8-7-3
<b>Section 8. Caribbean ICAO Region</b>	
8-8-1. APPLICATION .....	8-8-1
8-8-2. VERTICAL SEPARATION .....	8-8-1
8-8-3. LONGITUDINAL SEPARATION .....	8-8-1
8-8-4. LATERAL SEPARATION .....	8-8-3
8-8-5. VFR CLIMB AND DESCENT .....	8-8-3
<b>Section 9. Pacific ICAO Region</b>	
8-9-1. APPLICATION .....	8-9-1

<b>Paragraph</b>	<b>Page</b>
8-9-2. VERTICAL SEPARATION .....	8-9-1
8-9-3. LONGITUDINAL SEPARATION .....	8-9-1
8-9-4. LATERAL SEPARATION .....	8-9-3
8-9-5. COMPOSITE SEPARATION MINIMA .....	8-9-3
8-9-6. COMPOSITE SEPARATION ALTITUDE ASSIGNMENT .....	8-9-3
8-9-7. COMPOSITE SEPARATION APPLICATION .....	8-9-3
8-9-8. PROCEDURES FOR WEATHER DEVIATIONS AND OTHER CONTINGENCIES IN OCEANIC CONTROLLED AIRSPACE .....	8-9-4

### **Section 10. North American ICAO Region**

8-10-1. APPLICATION .....	8-10-1
8-10-2. VERTICAL SEPARATION .....	8-10-1
8-10-3. LONGITUDINAL SEPARATION .....	8-10-1
8-10-4. LATERAL SEPARATION .....	8-10-2

## **Chapter 9. Special Flights**

### **Section 1. General**

9-1-1. GENERAL .....	9-1-1
9-1-2. SPECIAL HANDLING .....	9-1-1
9-1-3. FLIGHT CHECK AIRCRAFT .....	9-1-1

### **Section 2. Special Operations**

9-2-1. AIRCRAFT CARRYING DANGEROUS MATERIALS .....	9-2-1
9-2-2. CELESTIAL NAVIGATION TRAINING .....	9-2-1
9-2-3. DEPARTMENT OF ENERGY (DOE) SPECIAL FLIGHTS .....	9-2-1
9-2-4. EXPERIMENTAL AIRCRAFT OPERATIONS .....	9-2-2
9-2-5. FAA RESEARCH AND DEVELOPMENT FLIGHTS .....	9-2-2
9-2-6. FLYNET .....	9-2-2
9-2-7. IFR MILITARY TRAINING ROUTES .....	9-2-2
9-2-8. INTERCEPTOR OPERATIONS .....	9-2-4
9-2-9. SPECIAL INTEREST SITES .....	9-2-4
9-2-10. SPECIAL AIR TRAFFIC RULES (SATR) AND SPECIAL FLIGHT RULES AREA (SFRA) .....	9-2-4
9-2-11. ATC SECURITY SERVICES FOR THE WASHINGTON, DC, SPECIAL FLIGHT RULES AREA (DC SFRA) .....	9-2-4
9-2-12. SECURITY NOTICE (SECNOT) .....	9-2-5
9-2-13. LAW ENFORCEMENT OPERATIONS BY CIVIL AND MILITARY ORGANIZATIONS .....	9-2-5
9-2-14. MILITARY AERIAL REFUELING .....	9-2-6
9-2-15. MILITARY OPERATIONS ABOVE FL 600 .....	9-2-7
9-2-16. MILITARY SPECIAL USE FREQUENCIES .....	9-2-8
9-2-17. AVOIDANCE OF AREAS OF NUCLEAR RADIATION .....	9-2-9
9-2-18. SAMP .....	9-2-9
9-2-19. AWACS/NORAD SPECIAL FLIGHTS .....	9-2-9
9-2-20. WEATHER RECONNAISSANCE FLIGHTS .....	9-2-9
9-2-21. EVASIVE ACTION MANEUVER .....	9-2-10
9-2-22. NONSTANDARD FORMATION/CELL OPERATIONS .....	9-2-10
9-2-23. OPEN SKIES TREATY AIRCRAFT .....	9-2-10

### **Section 3. Special Use, ATC-Assigned Airspace, and Stationary ALTRVs**

9-3-1. APPLICATION .....	9-3-1
--------------------------	-------

<b>Paragraph</b>	<b>Page</b>
9-3-2. SEPARATION MINIMA .....	9-3-1
9-3-3. VFR-ON-TOP .....	9-3-1
9-3-4. TRANSITING ACTIVE SUA/ATCAA .....	9-3-2

#### **Section 4. Fuel Dumping**

9-4-1. INFORMATION REQUIREMENTS .....	9-4-1
9-4-2. ROUTING .....	9-4-1
9-4-3. ALTITUDE ASSIGNMENT .....	9-4-1
9-4-4. SEPARATION MINIMA .....	9-4-1
9-4-5. INFORMATION DISSEMINATION .....	9-4-1

#### **Section 5. Jettisoning of External Stores**

9-5-1. JETTISONING OF EXTERNAL STORES .....	9-5-1
---	-------

#### **Section 6. Unmanned Free Balloons**

9-6-1. APPLICATION .....	9-6-1
9-6-2. DERELICT BALLOONS .....	9-6-2

#### **Section 7. Parachute Operations**

9-7-1. COORDINATION .....	9-7-1
9-7-2. CLASS A, CLASS B, AND CLASS C AIRSPACE .....	9-7-1
9-7-3. CLASS D AIRSPACE .....	9-7-1
9-7-4. OTHER CONTROL AIRSPACE .....	9-7-1

#### **Section 8. Unidentified Flying Object (UFO) Reports**

9-8-1. GENERAL .....	9-8-1
----------------------	-------

### **Chapter 10. Emergencies**

#### **Section 1. General**

10-1-1. EMERGENCY DETERMINATIONS .....	10-1-1
10-1-2. OBTAINING INFORMATION .....	10-1-1
10-1-3. PROVIDING ASSISTANCE .....	10-1-1
10-1-4. RESPONSIBILITY .....	10-1-1
10-1-5. COORDINATION .....	10-1-2
10-1-6. AIRPORT GROUND EMERGENCY .....	10-1-2
10-1-7. INFLIGHT EMERGENCIES INVOLVING MILITARY FIGHTER-TYPE AIRCRAFT .....	10-1-2

#### **Section 2. Emergency Assistance**

10-2-1. INFORMATION REQUIREMENTS .....	10-2-1
10-2-2. FREQUENCY CHANGES .....	10-2-1
10-2-3. AIRCRAFT ORIENTATION .....	10-2-1
10-2-4. ALTITUDE CHANGE FOR IMPROVED RECEPTION .....	10-2-1
10-2-5. EMERGENCY SITUATIONS .....	10-2-1
10-2-6. HIJACKED AIRCRAFT .....	10-2-2
10-2-7. VFR AIRCRAFT IN WEATHER DIFFICULTY .....	10-2-2
10-2-8. RADAR ASSISTANCE TO VFR AIRCRAFT IN WEATHER DIFFICULTY .....	10-2-2

<b>Paragraph</b>	<b>Page</b>
10-2-9. RADAR ASSISTANCE TECHNIQUES .....	10-2-3
10-2-10. EMERGENCY LOCATOR TRANSMITTER (ELT) SIGNALS .....	10-2-3
10-2-11. AIRCRAFT BOMB THREATS .....	10-2-4
10-2-12. EXPLOSIVE DETECTION K-9 TEAMS .....	10-2-5
10-2-13. MANPADS ALERT .....	10-2-5
10-2-14. UNAUTHORIZED LASER ILLUMINATION OF AIRCRAFT .....	10-2-5
10-2-15. EMERGENCY AIRPORT RECOMMENDATION .....	10-2-6
10-2-16. GUIDANCE TO EMERGENCY AIRPORT .....	10-2-6
10-2-17. EMERGENCY OBSTRUCTION VIDEO MAP (EOVM) .....	10-2-6
10-2-18. VOLCANIC ASH .....	10-2-6
10-2-19. REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT .....	10-2-7

### **Section 3. Overdue Aircraft**

10-3-1. OVERDUE AIRCRAFT/OTHER SITUATIONS .....	10-3-1
10-3-2. INFORMATION TO BE FORWARDED TO ARTCC .....	10-3-1
10-3-3. INFORMATION TO BE FORWARDED TO RCC .....	10-3-1
10-3-4. ALNOT .....	10-3-2
10-3-5. RESPONSIBILITY TRANSFER TO RCC .....	10-3-2
10-3-6. LAST KNOWN POSITION DETERMINATION .....	10-3-3
10-3-7. ALNOT CANCELLATION .....	10-3-3

### **Section 4. Control Actions**

10-4-1. TRAFFIC RESTRICTIONS .....	10-4-1
10-4-2. LIGHTING REQUIREMENTS .....	10-4-1
10-4-3. TRAFFIC RESUMPTION .....	10-4-1
10-4-4. COMMUNICATIONS FAILURE .....	10-4-1

### **Section 5. Miscellaneous Operations**

10-5-1. EXPLOSIVE CARGO .....	10-5-1
-------------------------------	--------

### **Section 6. Oceanic Emergency Procedures**

10-6-1. APPLICATION .....	10-6-1
10-6-2. PHASES OF EMERGENCY .....	10-6-1
10-6-3. ALERTING SERVICE AND SPECIAL ASSISTANCE .....	10-6-1
10-6-4. INFLIGHT CONTINGENCIES .....	10-6-2
10-6-5. SERVICES TO RESCUE AIRCRAFT .....	10-6-3

### **Section 7. Ground Missile Emergencies**

10-7-1. INFORMATION RELAY .....	10-7-1
10-7-2. IFR AND SVFR MINIMA .....	10-7-1
10-7-3. VFR MINIMA .....	10-7-1
10-7-4. SMOKE COLUMN AVOIDANCE .....	10-7-1
10-7-5. EXTENDED NOTIFICATION .....	10-7-1

## **Chapter 11. Traffic Management Procedures**

### **Section 1. General**

11-1-1. DUTY RESPONSIBILITY .....	11-1-1
-----------------------------------	--------



<b>Paragraph</b>	<b>Page</b>
11-1-2. DUTIES AND RESPONSIBILITIES .....	11-1-1
11-1-3. TIME BASED FLOW MANAGEMENT (TBFM) .....	11-1-2

## **Chapter 12. Canadian Airspace Procedures**

### **Section 1. General Control**

12-1-1. APPLICATION .....	12-1-1
12-1-2. AIRSPACE CLASSIFICATION .....	12-1-1
12-1-3. ONE THOUSAND-ON-TOP .....	12-1-1
12-1-4. SEPARATION .....	12-1-1
12-1-5. DEPARTURE CLEARANCE/COMMUNICATION FAILURE .....	12-1-2
12-1-6. PARACHUTE JUMPING .....	12-1-2
12-1-7. SPECIAL VFR (SVFR) .....	12-1-2

## **Chapter 13. Decision Support Tools**

### **Section 1. ERAM Decision Support Tools (EDST)**

13-1-1. DESCRIPTION .....	13-1-1
13-1-2. CONFLICT DETECTION AND RESOLUTION .....	13-1-1
13-1-3. TRIAL PLANNING .....	13-1-1
13-1-4. CONFLICT PROBE-BASED CLEARANCES .....	13-1-1
13-1-5. THE AIRCRAFT LIST (ACL), DEPARTURE LIST (DL) AND FLIGHT DATA MANAGEMENT .....	13-1-1
13-1-6. MANUAL COORDINATION AND THE COORDINATION MENU .....	13-1-2
13-1-7. HOLDING .....	13-1-2
13-1-8. RECORDING OF CONTROL DATA .....	13-1-2
13-1-9. ACKNOWLEDGEMENT OF AUTOMATED NOTIFICATION .....	13-1-5
13-1-10. CURRENCY OF TRAJECTORY INFORMATION .....	13-1-5
13-1-11. DELAY REPORTING .....	13-1-5
13-1-12. OVERDUE AIRCRAFT .....	13-1-5
13-1-13. USE OF GRAPHICS PLAN DISPLAY (GPD) .....	13-1-6
13-1-14. FORECAST WINDS .....	13-1-6
13-1-15. INTERFACILITY CONNECTIVITY .....	13-1-6
13-1-16. SURVEILLANCE AND FLIGHT DATA OUTAGES .....	13-1-6
13-1-17. AIRSPACE CONFIGURATION ELEMENTS .....	13-1-6

### **Section 2. ATOP – Oceanic**

13-2-1. DESCRIPTION .....	13-2-1
13-2-2. CONFLICT DETECTION AND RESOLUTION .....	13-2-1
13-2-3. INFORMATION MANAGEMENT .....	13-2-2
13-2-4. CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC) .....	13-2-3
13-2-5. COORDINATION .....	13-2-4
13-2-6. TEAM RESPONSIBILITIES – MULTIPLE PERSON OPERATION .....	13-2-4

## Appendices

<b>Paragraph</b>	<b>Page</b>
Appendix A. Standard Operating Practice (SOP) for the Transfer of Position Responsibility	Appendix A-1
Appendix B. Standard Operating Practice (SOP) for Aircraft Deviating for Weather Near Active Special Activity Airspace (SAA) .....	Appendix B-1
PILOT/CONTROLLER GLOSSARY .....	PCG-1
INDEX .....	I-1

Abbreviation	Meaning
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
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
TCDD . . . . .	Tower cab digital display

<b>Abbreviation</b>	<b>Meaning</b>
TDLS . . . . .	Terminal Data Link System
TDW . . . . .	Tower display workstation
TDWR . . . . .	Terminal Doppler Weather Radar
TDZL . . . . .	Touchdown Zone Light System
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.

**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.*

**NOTE—**

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

**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*



*be used when the aircraft is airborne to indicate a request for special handling.*

**REFERENCE–**

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

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

**REFERENCE–**

FAA Order JO 7110.65, Para 9–2–6, FLYNET.

FAA Order JO 7610.4, Para 12–4–1, “FLYNET” Flights, Nuclear Emergency Teams.

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

**NOTE–**

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

**i.** Provide priority handling to USAF aircraft engaged in aerial sampling missions using the code name “SAMP.”

**REFERENCE–**

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

FAA Order JO 7210.3, Para 5–3–4, Atmosphere Sampling For Nuclear Contamination.

FAA Order JO 7610.4, Para 12–4–3, Atmospheric Sampling For Nuclear Contamination.

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

**NOTE–**

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

**REFERENCE–**

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

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

**REFERENCE–**

FAA Order JO 7110.65, Para 9–2–20, Weather Reconnaissance Flights.

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

**NOTE–**

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

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

**REFERENCE–**

FAA Order JO 7110.65, Para 9–2–23, Open Skies Treaty Aircraft.

FAA Order JO 7210.3, Para 5–3–7, Open Skies Treaty Aircraft Priority Flight (F and D). Treaty on Open Skies, Treaty Document, 102–37.

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

**NOTE–**

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

**REFERENCE–**

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

**n.** IFR aircraft must have priority over SVFR aircraft.

**REFERENCE–**

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

**o.** Aircraft operating under the North American Route Program (NRP) and in airspace identified in the High Altitude Redesign (HAR) program, are not subject to route limiting restrictions (e.g., published preferred IFR routes, letter of agreement requirements, standard operating procedures).

**REFERENCE–**

FAA Order JO 7110.65, Para 2–3–2, En Route Data Entries.

FAA Order JO 7110.65, Para 2–2–15, North American Route Program (NRP) Information.

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

FAA Order JO 7210.3, Chapter 17, Section 16, North American Route Program.

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

**REFERENCE–**

FAA Order JO 7210.3, Para 17–4–5, Diversion Recovery.

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

## 2-1-5. EXPEDITIOUS COMPLIANCE

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

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

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

## 2-1-6. SAFETY ALERT

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

### NOTE-

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

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

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

a. Terrain/Obstruction Alert. Immediately issue/initiate an alert to an aircraft if you are aware the aircraft is at an altitude that, in your judgment, places

it in unsafe proximity to terrain and/or obstructions. Issue the alert as follows:

### PHRASEOLOGY-

*LOW ALTITUDE ALERT (call sign),*

*CHECK YOUR ALTITUDE IMMEDIATELY.*

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

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

### REFERENCE-

*P/CG Term – Final Approach – IFR*

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

### PHRASEOLOGY-

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

*and/or*

*CLIMB/DESCEND (specific altitude if appropriate) IMMEDIATELY.*

### EXAMPLE-

*“Traffic Alert, Cessna Three Four Juliet, 12'o clock, 1 mile advise you turn left immediately.”*

*or*

*“Traffic Alert, Cessna Three-Four Juliet, 12'o clock, 1 mile advise you turn left and climb immediately.”*

### REFERENCE-

*FAA Order JO 7110.65, Para 5-14-1, Conflict Alert (CA) and Mode C Intruder (MCI) Alert.*

*FAA Order JO 7110.65, Para 5-14-2, En Route Minimum Safe Altitude Warning (E-MSAW).*

*FAA Order JO 7110.65, Para 5-15-6, CA/MCI.*

*FAA Order JO 7110.65, Para 5-2-24, Altitude Filters.*

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

## 2-1-7. INFLIGHT EQUIPMENT MALFUNCTIONS

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

### NOTE-

*Inflight equipment malfunctions include partial or complete failure of equipment, which may affect either safety, separation standards, and/or the ability of the flight to proceed under IFR, or in Reduced Vertical Separation Minimum (RVSM) airspace, in the ATC system. Control-*

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**

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.

**NOTE–**

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

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

**REFERENCE–**

FAA Order JO 7110.65, Para 5–5–8, *Additional Separation for Formation Flights*.

P/CG Term– *Formation Flight*.

**b.** 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, Para 5–4–5, *Transferring Controller Handoff*.

FAA Order JO 7110.65, Para 5–4–6, *Receiving Controller Handoff*.

## **2–1–15. CONTROL TRANSFER**

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

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

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

**REFERENCE–**

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

FAA Order JO 7110.65, Para 5–4–5, *Transferring Controller Handoff*.

FAA Order JO 7110.65, Para 5–4–6, *Receiving Controller Handoff*.

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

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

## **2–1–16. SURFACE AREAS**

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

**REFERENCE–**

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

14 CFR Section 91.127, *Operating on or in the Vicinity of an Airport in Class E Airspace*.

P/CG Term– *Surface Area*.

**b.** Coordinate with the appropriate control tower for transit authorization when you are providing radar

traffic advisory service to an aircraft that will enter another facility's airspace.

**NOTE—**

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

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

**REFERENCE—**

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

**2-3-3. OCEANIC DATA ENTRIES***FIG 2-3-3*

1	2	7	10	12	14	16	16	18	21
3	4	8						19	21
5	6	9	11	13	15	17	17	20	24
22									
23									
10000	B763		BOS	ACK	TUK	LACKS	SLATN	KBOS TXKF	KZ C 70 87
DAL210	M	F370							
KZ	M080	22 of 70 A	0820	0820	0831	0846	0856	<b>R</b>	1 of 2

a. The ATOP system displays information on electronic flight progress strips and, in the event of a catastrophic system failure, will print flight progress strips with data in the corresponding numbered spaces:

*TBL 2-3-2*

Block	Information Recorded
1.	Mode 3/A beacon code, if applicable.
2.	Number of aircraft, if more than one, and type of aircraft.
3.	Aircraft identification.
4.	Reduced separation flags. Indicators are available for: M – Mach Number Technique (MNT), R – Reduced MNT, D or 3 – Distance-based longitudinal separation using 50 NM (D) or 30 NM (3), and W– Reduced Vertical Separation Minimum (RVSM). These flags are selectable for aircraft whose flight plans contain the required equipment qualifiers for each separation criteria.
5.	Controlling sector number.
6.	Filed airspeed or assigned Mach number/True airspeed.
7.	Reported flight level. May contain an indicator for a flight that is climbing (↑) or descending (↓). Reports from Mode C, ADS or position reports are displayed in that order of preference.
8.	Cleared flight level. May contain an indicator for a future conditional altitude ( * ) that cannot be displayed.

Block	Information Recorded
9.	Requested flight level, if applicable.
10.	Previously reported position.
11.	Actual time over previously reported position.
12.	Last reported position.
13.	Actual time over last reported position.
14.	Next reporting position.
15.	In-conformance pilot's estimate or controller-accepted pilot's estimate for next reporting position.
16.	Future reporting position(s).
17.	System estimate for future reporting position(s).
18.	Departure airport or point of origin.
19.	Destination airport or filed point of flight termination.
20.	Indicators. Indicators and toggles for displaying or suppressing the display of the route of flight (F), second flight profile (2), radar contact (A), annotations (&), degraded Required Navigation Performance (RNP, indicator R) and clearance restrictions (X).
21.	Coordination indicator(s).
22.	Annotations.
23.	Clearance restrictions and conditions (may be multiple lines).
24.	Strip number and total number of strips (printed strips only).

b. Standard annotations and abbreviations for Field 22 may be specified by facility directives.

**2-3-4. TERMINAL DATA ENTRIES****a. Arrivals:**

Information recorded on the flight progress strips (FAA Forms 7230-7.1, 7230-7.2, and 7230-8) must be entered in the correspondingly numbered spaces.

Facility managers can authorize omissions and/or optional use of spaces 2A, 8A, 8B, 9A, 9B, 9C, and 10-18, if no misunderstanding will result. These omissions and/or optional uses must be specified in a facility directive.

*FIG 2-3-4*

1	2A	5	8	9	9B	10	11	12
2		6	8A			13	14	15
3								
4		7	8B	9A	9C	16	17	18

*TBL 2-3-3*

Block	Information Recorded
1.	Aircraft identification.
2.	Revision number (FDIO locations only).
2A.	Strip request originator. (At FDIO locations this indicates the sector or position that requested a strip be printed.)
3.	Number of aircraft if more than one, heavy aircraft indicator "H/" if appropriate, type of aircraft, and aircraft equipment suffix.
4.	Computer identification number if required.
5.	Secondary radar (beacon) code assigned.
6.	(FDIO Locations.) The previous fix will be printed. (Non-FDIO Locations.) Use of the inbound airway. This function is restricted to facilities where flight data is received via interphone when agreed upon by the center and terminal facilities.
7.	Coordination fix.
8.	Estimated time of arrival at the coordination fix or destination airport.
8A.	<b>OPTIONAL USE.</b>

Block	Information Recorded
8B.	<b>OPTIONAL USE</b> , when voice recorders are operational; <b>REQUIRED USE</b> , when the voice recorders are not operating and strips are being used at the facility. This space is used to record reported RA events when the voice recorders are not operational and strips are being used at the facility. The letters RA followed by a climb or descent arrow (if the climb or descent action is reported) and the time (hhmm) the event is reported.
9.	Altitude (in hundreds of feet) and remarks.
<b>NOTE-</b>	<i>Altitude information may be written in thousands of feet provided the procedure is authorized by the facility manager, and is defined in a facility directive, i. e., FL 230 as 23, 5,000 feet as 5, and 2,800 as 2.8.</i>
9A.	Minimum fuel, destination airport/point out/radar vector/speed adjustment information. Air traffic managers may authorize in a facility directive the omission of any of these items, <b>except minimum fuel</b> , if no misunderstanding will result.
<b>NOTE-</b>	<i>Authorized omissions and optional use of spaces must be specified in the facility directive concerning strip marking procedures.</i>
9B.	<b>OPTIONAL USE.</b>
9C.	<b>OPTIONAL USE.</b>
10-18.	Enter data as specified by a facility directive. Radar facility personnel need not enter data in these spaces except when nonradar procedures are used or when radio recording equipment is inoperative.

## 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 (SO<sub>2</sub> or H<sub>2</sub>S), 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. SO<sub>2</sub> is identifiable as the sharp, acrid odor of a freshly struck match. H<sub>2</sub>S 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 nine 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 intra-facility 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:



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

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

**NOTE–**

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

**REFERENCE–**

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

**PHRASEOLOGY–**

*WEATHER/CHAFF AREA BETWEEN (number) O’CLOCK AND (number) O’CLOCK (number) MILES, and/or (number) MILE BAND OF WEATHER/CHAFF FROM (fix or number of miles and direction from fix) TO (fix or number of miles and direction from fix).*

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

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

1. LIGHT.
2. MODERATE.
3. HEAVY.
4. EXTREME.

**NOTE–**

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

**PHRASEOLOGY–**

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

**EXAMPLE–**

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

**REFERENCE–**

*P/CG Term– Precipitation Radar Weather Descriptions.*

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

1. Level 1 = LIGHT
2. Level 2 = MODERATE
3. Levels 3 and 4 = HEAVY
4. Levels 5 and 6 = EXTREME

e. When precipitation intensity information is not available.

**PHRASEOLOGY–**

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

**EXAMPLE–**

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

**NOTE–**

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

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

1. Describe the lowest displayable precipitation intensity as MODERATE.

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

**PHRASEOLOGY–**

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

**EXAMPLE–**

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

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

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

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

**REFERENCE–**

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

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

**PHRASEOLOGY–**

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

**NOTE–**

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

**REFERENCE–**

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

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

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

**PHRASEOLOGY–**

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

or

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

**EXAMPLE–**

**1.** “Deviation 20 degrees right approved, when able proceed direct O’Neill VORTAC and advise.” En Route: The corresponding fourth line entry is “D20R/ONL” or “D20R/F.”

**2.** “Deviation 30 degrees left approved, when able fly heading zero niner zero, vector to join J324 and advise.” En Route: In this case the free text character limitation prevents use of fourth line coordination and verbal coordination is required.

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

**PHRASEOLOGY–**

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

**EXAMPLE–**

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

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

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

**PHRASEOLOGY–**

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

or

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

**EXAMPLE–**

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

**j.** When forwarding weather deviation information, the transferring controller must clearly coordinate the nature of the route guidance service being provided. This coordination should include, but is not limited to: assigned headings, suggested

headings, pilot-initiated deviations. Coordination can be accomplished by: verbal, automated, or predetermined procedures. Emphasis should be made between: controller assigned headings, suggested headings, or pilot initiated deviations.

**EXAMPLE–**

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

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

**REFERENCE–**

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

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

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

**REFERENCE–**

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

**EXAMPLE–**

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

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

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

**EXAMPLE–**

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

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

**EXAMPLE–**

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

1. The supervisory traffic management coordinator-in-charge/operations supervisor/controller-in-charge must verify the digitized radar weather information by the best means available (e.g., pilot reports, local tower personnel, etc.) if the

weather data displayed by digitized radar is reported as questionable or erroneous. Errors in weather radar presentation must be reported to the technical operations technician and the air traffic supervisor must determine if the digitized radar derived weather data is to be displayed and a NOTAM distributed.

**NOTE–**

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

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

**TERMINAL.** Observed elements of weather information must be disseminated as follows:

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

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

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

**NOTE–**

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

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

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

4. The information is obtained from a FAA approved automation surface weather system.

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

## 2–6–6. HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS)

Controllers must advise pilots of hazardous weather that may impact operations within 150 NM of their sector or area of jurisdiction. Hazardous weather

information contained in HIWAS broadcasts includes Airmen's Meteorological Information (AIRMET), Significant Meteorological Information (SIGMET), Convective SIGMET (WST), Urgent Pilot Weather Reports (UUA), and Center Weather Advisories (CWA). Facilities must review alert messages to determine the geographical area and operational impact for hazardous weather information broadcasts. The broadcast is not required if aircraft on your frequency(s) will not be affected.

**a.** Controllers within commissioned HIWAS areas must broadcast a HIWAS alert on all frequencies, except emergency frequency, upon receipt of hazardous weather information. Controllers are required to disseminate data based on the operational impact on the sector or area of control jurisdiction.

**NOTE—**

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

**PHRASEOLOGY—**

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

**b.** Controllers outside of commissioned HIWAS areas must:

**1.** Advise pilots of the availability of hazardous weather advisories. Pilots requesting additional information should be directed to contact the nearest Flight Service.

**2.** Apply the same procedure when HIWAS outlets, or outlets with radio coverage extending into your sector or airspace under your jurisdiction, are out of service.

**PHRASEOLOGY—**

**ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION FOR (specific weather phenomenon) WITHIN (geographical area) AVAILABLE FROM FLIGHT SERVICE.**

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

**REFERENCE—**

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

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

**NOTE—**

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

## Section 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. Broadcast on all appropriate frequencies to advise aircraft of a change in the ATIS code/message.

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.

#### 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.”*

## 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.”*





**b.** During the time Braking Action Advisories are in effect, take the following action:

**1.** Issue the latest braking action report for the runway in use to each arriving and departing aircraft early enough to be of benefit to the pilot. When possible, include reports from super or heavy aircraft when the arriving or departing aircraft is a super or heavy.

**2.** If no report has been received for the runway of intended use, issue an advisory to that effect.

**PHRASEOLOGY–**

*NO BRAKING ACTION REPORTS RECEIVED FOR RUNWAY (runway number).*

**3.** Advise the Airport Operator that runway braking action reports of “good to medium,” “medium,” “medium to poor,” “poor,” or “nil” have been received.

**REFERENCE–**

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

**4.** Solicit PIREPs of runway braking action.

**REFERENCE–**

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

FAA Order JO 7110.65, Para 3–9–1, Departure Information

FAA Order JO 7110.65, Para 3–10–1, Landing Information

FAA Order JO 7110.65, Para 4–7–12, Airport Conditions

FAA Order JO 7110.65, Para 2–6–2, PIREP Solicitation and Dissemination.

### 3–3–6. ARRESTING SYSTEM OPERATION

**a.** For normal operations, arresting systems remotely controlled by ATC must remain in the retracted or down position.

**NOTE–**

**1.** *USN– Runway Arresting Gear– barriers are not operated by ATC personnel. Readiness/rigging of the equipment is the responsibility of the operations department.*

**2.** *A request to raise a barrier or hook cable means the barrier or cable on the departure end of the runway. If an approach end engagement is required, the pilot or military authority will specifically request that the approach end cable be raised.*

**REFERENCE–**

FAA Order JO 7610.4, Chapter 9, Section 3. Aircraft Arresting System, Single Frequency Approach (SFA), Simulated Flameout (SFO)/Emergency Landing Pattern (ELP) Operations, Celestial Navigation (CELNAV) Training, Para 9–3–1 through Para 9–3–8.

**b.** Raise aircraft arresting systems whenever:

**1.** Requested by a pilot.

**NOTE–**

*The standard emergency phraseology for a pilot requesting an arresting system to be raised for immediate engagement is:*

*“BARRIER – BARRIER – BARRIER”*

*or*

*“CABLE – CABLE – CABLE.”*

**2.** Requested by military authority; e.g., airfield manager, supervisor of flying, mobile control officer, etc.

**NOTE–**

*USAF. Web barriers at the departure end of the runway may remain in the up position when requested by the senior operational commander. The IFR Enroute Supplement and AP-1 will describe specific barrier configuration. ATC will advise transient aircraft of the barrier configuration using the phraseology in subpara c, below.*

**3.** A military jet aircraft is landing with known or suspected radio failure or conditions (drag chute/hydraulic/electrical failure, etc.) that indicate an arresting system may be needed. Exceptions are authorized for military aircraft which cannot engage an arresting system (C–9, C–141, C–5, T–39, etc.) and should be identified in a letter of agreement and/or appropriate military directive.

**c.** When requested by military authority due to freezing weather conditions or malfunction of the activating mechanism, the barrier/cable may remain in a raised position provided aircraft are advised.

**PHRASEOLOGY–**

*YOUR DEPARTURE/LANDING WILL BE TOWARD/ OVER A RAISED BARRIER/CABLE ON RUNWAY (number), (location, distance, as appropriate).*

**d.** Inform civil and U.S. Army aircraft whenever rubber supported cables are in place at the approach end of the landing runway, and include the distance of the cables from the threshold. This information may be omitted if it is published in the “Notices to Airmen” publication/DOD FLIP.

**EXAMPLE–**

*“Runway One Four arresting cable one thousand feet from threshold.”*

**e.** When arresting system operation has been requested, inform the pilot of the indicated barrier/cable position.

**PHRASEOLOGY–**

*(Identification), BARRIER/CABLE INDICATES UP/DOWN. CLEARED FOR TAKEOFF/TO LAND.*

**f.** Time permitting, advise pilots of the availability of all arresting systems on the runway in question when a pilot requests barrier information.

**g.** If an aircraft engages a raised barrier/cable, initiate crash alarm procedures immediately.

**h.** For preplanned practice engagements not associated with emergencies, crash alarm systems need not be activated if, in accordance with local military operating procedures, all required notifications are made before the practice engagement.

**REFERENCE—**

FAA Order JO 7110.65, Para 4–7–12, Airport Conditions.

### **3–3–7. FAR FIELD MONITOR (FFM) REMOTE STATUS UNIT**

**a.** To meet the demand for more facilities capable of operating under CAT III weather, Type II equipment is being upgraded to Integrity Level 3. This integrity level will support operations which place a high degree of reliance on ILS guidance for positioning through touchdown.

**b.** Installation of the FFM remote status indicating units is necessary to attain the integrity necessary to meet internationally agreed upon reliability values in support of CAT III operations on Type II ILS equipment. The remote status indicating unit used in conjunction with Type II equipment adds a third integrity test; thereby, producing an approach aid which has integrity capable of providing Level 3 service.

**c.** The remote status sensing unit, when installed in the tower cab, will give immediate indications of localizer out-of-tolerance conditions. The alarm in the FFM remote status sensing unit indicates an inoperative or an out-of-tolerance localizer signal; e.g., the course may have shifted due to equipment malfunction or vehicle/aircraft encroachment into the critical area.

**d.** Operation of the FFM remote sensing unit will be based on the prevailing weather. The FFM remote sensing unit must be operational when the weather is below CAT II ILS minimums.

**REFERENCE—**

FAA Order 6750.24, Appendix A, Abnormal Checklist

**e.** When the remote status unit indicates that the localizer FFM is in alarm (aural warning following the preset delay) and:

**1.** The aircraft is outside the middle marker (MM) or in the absence of a MM, ½ mile final, check for encroachment of those portions of the critical area that can be seen from the tower. It is understood that the entire critical area may not be visible due to low ceilings and poor visibility. The check is strictly to determine possible causal factors for the out-of-tolerance situation. If the alarm has not cleared prior to the aircraft's arriving at the MM or in the absence of a MM, ½ mile final, immediately issue an advisory that the FFM remote status sensing unit indicates the localizer is unreliable.

**2.** The aircraft is between the MM or ½ mile final and the inner marker (IM), or if the IM is not installed, the CAT II Missed Approach Point (MAP), immediately issue an advisory that the FFM remote status sensing unit indicates the localizer is unreliable.

**PHRASEOLOGY—**

**CAUTION, MONITOR INDICATES RUNWAY (number) LOCALIZER UNRELIABLE.**

**3.** The aircraft has passed the IM or the CAT II MAP (if the IM is not installed) there is no action requirement. Although the FFM has been modified with filters which dampen the effect of false alarms, you may expect alarms when aircraft are located between the FFM and the localizer antenna either on landing or on takeoff.

**REFERENCE—**

FAA Order JO 7110.65, Para 4–7–12, Airport Conditions.

b. As requested by the pilot.

c. As you deem necessary, if not contrary to pilot's request.

**TBL 3-4-6**

**Two Step MALSR/One Step RAIL/Two Step ODALS**

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

**TBL 3-4-7**

**Three Step MALSR/Three Step RAIL/  
Three Step ODALS**

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

**REFERENCE-**

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

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

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

1. As requested by the pilot.

2. As you deem necessary if not contrary to pilot request.

b. Operate the SSALR system when the conditions in subpara a are not a factor.

**3-4-10. RUNWAY EDGE LIGHTS**

Operate the runway edge light system/s serving the runway/s in use as follows:

a. Between sunset and sunrise, turn the lights on:

1. For departures. Before an aircraft taxis onto the runway and until it leaves the Class B, Class C, or Class D surface area.

2. For arrivals:

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

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

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

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

c. As required by facility directives to meet local conditions.

d. Different from subparas a, b, or c above, when:

1. You consider it necessary, or

2. Requested by a pilot and no other known aircraft will be adversely affected.

**NOTE-**

Pilots may request lights to be turned on or off contrary to subparas a, b, or c. However, 14 CFR Part 135 operators are required to land/takeoff on lighted runways/heliport landing areas at night.

e. Do not turn on the runway edge lights when a NOTAM closing the runway is in effect.

**NOTE-**

Application concerns use for takeoffs/landings/approaches and does not preclude turning lights on for use of unaffected portions of a runway for taxiing aircraft, surface vehicles, maintenance, repair, etc.

**REFERENCE-**

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

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

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

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

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

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

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

\*and/or appropriate RVR/RVV equivalent.

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

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

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

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

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

#### **NOTE-**

When going from a given brightness step setting to a lower setting, rotation of the brightness control to a point below the intended step setting and then back to the appropriate step setting will ensure that the MALSR will operate at the appropriate brightness.

#### **REFERENCE-**

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

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

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

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

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

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

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

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

#### **REFERENCE-**

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

### 3-4-15. HIGH SPEED TURNOFF LIGHTS

Operate high speed turnoff lights:

- a. Whenever the associated runway lights are used for arriving aircraft. Leave them on until the aircraft has either entered a taxiway or passed the last light.
- b. As required by facility directives to meet local conditions.
- c. As requested by the pilot.

### 3-4-16. TAXIWAY LIGHTS

Operate taxiway lights in accordance with TBL 3-4-11, TBL 3-4-12, or TBL 3-4-13 except:

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

*TBL 3-4-11*

#### Three Step Taxiway Lights

Step	Visibility	
	Day	Night
3	Less than 1 mile	When requested
2	When requested	Less than 1 mile
1	When requested	1 mile or more

*TBL 3-4-12*

#### Five Step Taxiway Lights

Step	Visibility	
	Day	Night
5	Less than 1 mile	When requested
4	When requested	Less than 1 mile
3	When requested	1 mile or more
1 & 2	When requested	When requested

*TBL 3-4-13*

#### One Step Taxiway Lights

Day	Night
Less than 1 mile	On

#### NOTE-

AC 150/5340-30, *Design and Installation Details for Airport Visual Aides*, contains recommended brightness levels for variable setting taxiway lights.

### 3-4-17. OBSTRUCTION LIGHTS

If controls are provided, turn the lights on between sunset and sunrise.

### 3-4-18. ROTATING BEACON

If controls are provided, turn the rotating beacon on:

- a. Between sunset and sunrise.
- b. Between sunrise and sunset when the reported ceiling or visibility is below basic VFR minima.

### 3-4-19. RUNWAY STATUS LIGHTS (RWSL)

#### TERMINAL

RWSL is equipped with automatic intensity settings and must be operated on a continuous basis except under the following conditions:

- a. If a pilot or vehicle report indicates any portion of the RWSL system is on and is not able to accept an ATC clearance; then

1. ATC must visually scan the entire runway. If the runway is observed to be clear and the lights are still illuminated, then the lights must be turned off and clearance re-issued.

2. If a portion of the runway is not visible from the tower, ATC must visually scan the ASDE system. If the runway is observed to be clear and the lights are still illuminated, then the lights must be turned off and clearance re-issued.

- b. When the RWSL Operational Status displays "Lost Comm with System," consider the RWSL system out of service until checked and confirmed to be operational by technical operations personnel.

c. Once RWSL systems are turned off, they must remain off until returned to service by technical operations personnel.

- d. Upon pilot request, adjust the light intensity.



## Section 7. Taxi and Ground Movement Procedures

### 3-7-1. GROUND TRAFFIC MOVEMENT

Issue by radio or directional light signals specific instructions which approve or disapprove the movement of aircraft, vehicles, equipment, or personnel on the movement area except where permitted in an LOA.

#### REFERENCE-

FAA Order JO 7210.3, Para 4-3-1, Letters of Agreement  
FAA Order JO 7210.3, Para 4-3-2, Appropriate Subjects

a. Do not issue *conditional* instructions that are dependent upon the movement of an arrival aircraft on or approaching the runway or a departure aircraft established on a takeoff roll. Do not say, "Line up and wait behind landing traffic," or "Taxi/proceed across Runway Three-Six behind departing/landing Citation." The above requirements do not preclude issuing instructions to follow an aircraft observed to be operating on the movement area in accordance with an ATC clearance/instruction and in such a manner that the instructions to follow are not ambiguous.

b. Do not issue unconditional instructions when authorizing movement on a runway/taxiway for the purpose of airfield checks or other airport operations. Instructions must ensure positive control with specific instructions to proceed on a runway or movement area, and as necessary, hold short instructions.

#### REFERENCE-

FAA Order JO 7110.65, Para 3-1-3, Use of Active Runways  
FAA Order JO 7110.65, Para 3-7-2, Taxi and Ground Movement Operations

#### EXAMPLE-

"Airport 1, proceed on Runway 26R, hold short of Runway 18L."

"Airport 1 proceed on taxi way B, hold short of Runway 18L."

"Airport 1 proceed on Runway 26R." (additional instructions as necessary.)

#### NOTE-

1. The following are examples of unconditional instructions and are not approved for use: "THE FIELD IS YOURS," "CLEARED ON ALL SURFACES," "THE AIRPORT IS YOURS," and "PROCEED ON ALL RUNWAYS AND TAXIWAYS."

2. "PROCEED AS REQUESTED" is not approved phraseology for instructing aircraft, vehicles, equipment, or personnel to cross or operate on a runway.

c. Do not use the word "cleared" in conjunction with authorization for aircraft to taxi or equipment/vehicle/personnel operations. Use the prefix "taxi," "proceed," or "hold," as appropriate, for aircraft instructions and "proceed" or "hold" for equipment/vehicles/personnel.

d. Intersection departures may be initiated by a controller or a controller may authorize an intersection departure if a pilot requests. Issue the measured distance from the intersection to the runway end rounded "down" to the nearest 50 feet to any pilot who requests and to all military aircraft, unless use of the intersection is covered in appropriate directives.

#### NOTE-

1. Exceptions are authorized where specific military aircraft routinely make intersection takeoffs and procedures are defined in appropriate directives. The authority exercising operational control of such aircraft ensures that all pilots are thoroughly familiar with these procedures, including the usable runway length from the applicable intersection.

2. Some airports publish "declared distances" for a particular runway. These are published in the Chart Supplement U.S. or the Aeronautical Information Publication (AIP) and there is no requirement that facility personnel be aware of them. These distances are a means of satisfying airport design criteria and are intended to be used by pilots and/or operators for preflight performance planning only. There are no special markings, signing, or lighting associated with declared distances and they do not limit the actual runway available for use by an aircraft. Therefore, they cannot be used for any air traffic control purpose. If pilots inquire about the existence of declared distances, refer them to the Chart Supplement U.S. or AIP.

#### PHRASEOLOGY-

RUNWAY (number) AT (taxiway designator) INTERSECTION DEPARTURE (remaining length) FEET AVAILABLE.

#### REFERENCE-

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

e. Do not use the term "full length" when the runway length available for departures has been temporarily shortened. On permanently shortened runways, do not use the term "full length" until the

Chart Supplement U.S. is updated to include the change(s).

**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

### 3-7-2. TAXI AND GROUND MOVEMENT OPERATIONS

Issue the route for the aircraft/vehicle to follow on the movement area in concise and easy to understand terms. The taxi clearance/route must include the specific route to follow. When a taxi clearance to a runway is issued to an aircraft, confirm the aircraft has the correct runway assignment.

**NOTE–**

1. A pilot's read back of taxi instructions with the runway assignment can be considered confirmation of runway assignment.

2. Movement of aircraft or vehicles on nonmovement areas is the responsibility of the pilot, the aircraft operator, or the airport management.

a. When authorizing an aircraft to taxi or a vehicle to proceed on the movement area, specify the taxi instructions/route. If it is the intent to hold the aircraft/vehicle short of:

1. A runway: issue the route up to the runway hold short point. When issuing a runway crossing clearance, include specific instructions on where to cross the runway;

2. Any other point along the route, issue:

(a) the route up to the hold short point, or

(b) the entire route and then state the hold short instructions.

After issuing a crossing clearance, specify the taxi instructions/route an aircraft/vehicle is to follow, if not previously issued.

**NOTE–**

The absence of holding instructions authorizes an aircraft/vehicle to cross all taxiways that intersect the taxi route.

**PHRASEOLOGY–**

**HOLD POSITION.**

*HOLD FOR (reason)*

*CROSS (runway), at (runway/taxiway)*

*or*

*TAXI/CONTINUE TAXIING/PROCEED VIA (route),*

*or*

*ON (runway number or taxiways, etc.),*

*or*

*TO (location),*

*or*

*(direction),*

*or*

*ACROSS RUNWAY (number), at (runway/taxiway).*

*or*

*VIA (route), HOLD SHORT OF (location)*

*or*

*FOLLOW (traffic) (restrictions as necessary)*

*or*

*BEHIND (traffic).*

**EXAMPLE–**

*“Cross Runway Two–Eight Left, at taxiway Alpha, hold short of Runway Two–Eight Right.”*

*“Taxi/continue taxiing/proceed to the hangar.”*

*“Taxi/continue taxiing/proceed straight ahead then via ramp to the hangar.”*

*“Taxi/continue taxiing/proceed on Taxiway Charlie, hold short of Runway Two–Seven.”*

*or*

*“Taxi/continue taxiing/proceed on Charlie, hold short of Runway Two–Seven.”*

b. When authorizing an aircraft to taxi to an assigned takeoff runway, state the departure runway followed by the specific taxi route. Issue hold short instructions, in accordance with paragraph a above, when an aircraft will be required to hold short of a runway or other points along the taxi route.



**NOTE–**

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

**PHRASEOLOGY–**

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

or

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

**EXAMPLE–**

“Runway Three–Six Left, taxi via taxiway Alpha, hold short of taxiway Charlie.”

or

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

or

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

or

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

or

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

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

**NOTE–**

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

**PHRASEOLOGY–**

“Cross (runway) at( runway/taxiway), hold short of

(runway)”, or

Cross (runways) at (runway/taxiway).

**EXAMPLE–**

“Cross Runway One–Six Left at Taxiway Bravo, hold short of Runway One–Six Right.”

“Cross Runway One–Six Left and Runway One–Six Right at Taxiway Bravo.”

**REFERENCE–**

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

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

**EXAMPLE–**

“Follow (traffic), cross Runway Two–Seven Right, at Taxiway Whiskey”

or

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

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

**NOTE–**

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

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

**NOTE–**

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

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

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

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

**REFERENCE–**

AIM, Runway Position Holding Markings, Para 2–3–5a

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

2. During arrival operations, ensure the following:

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

**REFERENCE–**

P/CG Term – Clear of Runway

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

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

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

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

**REFERENCE–**

FAA Order JO 7110.65, Para 3–10–4, Intersecting

Runway/Intersecting Flight Path Separation

FAA Order JO 7210.3, Para 10–3–7, Land and Hold Short Operations (LAHSO)

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

**PHRASEOLOGY–**

READ BACK HOLD INSTRUCTIONS.

**EXAMPLE–**

1. “American Four Ninety Two, Runway Three Six Left, taxi via taxiway Charlie, hold short of Runway Two Seven Right.”

or

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

“American Four Ninety Two, Roger.”

“American Four Ninety Two, read back hold instructions.”

2. “Cleveland Tower, American Sixty Three is ready for departure.”

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

“American Sixty Three, Roger.”

“American Sixty Three, read back hold instructions.”

3. “OPS Three proceed via taxiway Charlie hold short of Runway Two Seven.”

or

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

“OPS Three, Roger.”

“OPS Three, read back hold instructions.”

**NOTE–**

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

i. Issue progressive taxi/ground movement instructions when:

1. A pilot/operator requests.

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

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

**NOTE–**

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

**REFERENCE–**

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

FAA Order JO 7110.65, Para 3–11–1, Taxi and Ground Movement Operation.

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

**PHRASEOLOGY–**

TAXI WITHOUT DELAY (traffic if necessary).

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

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

**PHRASEOLOGY–**

HOLD SHORT OF (runway) APPROACH

■ **HOLD SHORT OF (runway) DEPARTURE**

### 3-7-3. GROUND OPERATIONS

#### WAKE TURBULENCE APPLICATION

Avoid clearances which require:

- a. Super or heavy aircraft to use greater than normal taxiing power.
- b. Small aircraft or helicopters to taxi in close proximity to taxiing or hover-taxi helicopters.

**NOTE-**

*Use caution when taxiing smaller aircraft/helicopters in the vicinity of larger aircraft.*

**REFERENCE-**

*AC 90-23, Aircraft Wake Turbulence, Para 10 and Para 11.*

### 3-7-4. RUNWAY PROXIMITY

Hold a taxiing aircraft or vehicle clear of the runway as follows:

- a. Instruct aircraft or vehicle to hold short of a specific runway.
- b. Instruct aircraft or vehicle to hold at a specified point.
- c. Issue traffic information as necessary.

**PHRASEOLOGY-**

*HOLD SHORT OF/AT (runway number or specific point), (traffic or other information).*

**NOTE-**

*Establishing hold lines/signs is the responsibility of the airport manager. The standards for surface measurements, markings, and signs are contained in AC 150/5300-13, Airport Design; AC 150/5340-1, Standards for Airport Markings, and AC 150/5340-18, Standards for Airport Sign Systems. The operator is responsible for properly positioning the aircraft, vehicle, or equipment at the appropriate hold line/sign or designated point. The requirements in para 3-1-12, Visually Scanning Runways, remain valid as appropriate.*

**REFERENCE-**

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

*FAA Order JO 7110.65, Para 3-10-10, Altitude Restricted Low Approach.*

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

### 3-7-5. PRECISION APPROACH CRITICAL AREA

a. ILS critical area dimensions are described in FAA Order 6750.16, Siting Criteria for Instrument Landing Systems. Aircraft and vehicle access to the ILS critical area must be controlled to ensure the integrity of ILS course signals whenever the official weather observation is a ceiling of less than 800 feet or visibility less than 2 miles. Do not authorize vehicles/aircraft to operate in or over the critical area, except as specified in subpara a1, whenever an arriving aircraft is inside the ILS outer marker (OM) or the fix used in lieu of the OM unless the arriving aircraft has reported the runway in sight or is circling to land on another runway.

**PHRASEOLOGY-**

*HOLD SHORT OF (runway) ILS CRITICAL AREA.*

**NOTE-**

*All available weather sources METARs/SPECI/PIREPS/Controller observations are reported ceilings and/or visibilities and must be disseminated as described in FAA Order JO 7110.65 and FAA Order JO 7210.3.*

**REFERENCE-**

*FAA Order JO 7110.65, Para 2-6-2 PIREP Solicitation and Dissemination*

*FAA Order JO 7210.3, Para 2-9-2, Receipt and Dissemination of Weather Observations*

*FAA Order JO 7210.3, Para 10-3-1, SIGMENT and PIREP Handling*

*FAA Order JO 7900.5, Para 6.4d, Equipment for Sky Condition*

#### 1. LOCALIZER CRITICAL AREA

(a) Do not authorize vehicle or aircraft operations in or over the area when an arriving aircraft is inside the ILS OM or the fix used in lieu of the OM when the official weather observation is a ceiling of less than 800 feet or visibility less than 2 miles, except:

(1) A preceding arriving aircraft on the same or another runway that passes over or through the area while landing or exiting the runway.

(2) A preceding departing aircraft or missed approach on the same or another runway that passes through or over the area.

(b) In addition to subpara a1(a), when the official weather observation indicates a ceiling of less than 200 feet or RVR 2,000 feet, do not authorize vehicles or aircraft operations in or over the area when an arriving aircraft is inside the middle marker, 1/2 final mile.

2. GLIDESLOPE CRITICAL AREA. Do not authorize vehicles or aircraft operations in or over the

area when an arriving aircraft is inside the ILS OM or the fix used in lieu of the OM unless the arriving aircraft has reported the runway in sight or is circling to land on another runway when the official weather observation indicates a ceiling of less than 800 feet or visibility less than 2 miles.

b. Operators commonly conduct “coupled” or “autoland” approaches to satisfy maintenance, training, or reliability program requirements. Promptly issue an advisory if the critical area will not be protected when an arriving aircraft advises that a “coupled,” “CATIII,” “autoland,” or similar type approach will be conducted and the official weather observation indicates a ceiling of 800 feet or more, or the visibility is 2 miles or more.

**PHRASEOLOGY–**

**ILS CRITICAL AREA NOT PROTECTED.**

c. The Department of Defense (DOD) is authorized to define criteria for protection of precision approach critical areas at military controlled airports. This protection is provided to all aircraft operating at that military controlled airport. Waiver authority for DOD precision approach critical area criteria rests with the appropriate military authority.

**NOTE–**

*Signs and markings are installed by the airport operator to define the ILS critical area. No point along the longitudinal axis of the aircraft is permitted past the hold line for holding purposes. The operator is responsible to properly position the aircraft, vehicle, or equipment at the appropriate hold line/sign or designated point. The requirements in Para 3–1–12, Visually Scanning Runways, remain valid as appropriate.*

**REFERENCE–**

*AC150/5340–1, Standards for Airport Markings.*

**3–7–6. PRECISION OBSTACLE FREE ZONE (POFZ) AND FINAL APPROACH OBSTACLE CLEARANCE SURFACES (OCS)**

a. Ensure the POFZ is clear of traffic (aircraft or vehicles) when an aircraft on a vertically-guided final approach is within 2 miles of the runway threshold and the official weather observation

indicates the ceiling is below 300 feet or visibility is less than 3/4 SM to protect aircraft executing a missed approach.

**NOTE–**

*Only horizontal surfaces (e.g., the wings) can penetrate the POFZ, but not the vertical surfaces (e.g., fuselage or tail). Three hundred feet (300) is used because ATC does not measure ceilings in fifty (50) foot increments.*

b. Ensure the final approach OCS (e.g., ILS /LPV W, X, and Y surfaces) are clear of aircraft/vehicles when an aircraft on the vertically-guided approach is within 2 miles of the runway threshold and the official weather observation indicates the ceiling is below 800 feet or visibility is less than 2 SM to protect aircraft executing a missed approach.

**NOTE–**

1. *The POFZ and the close-in portion of the final approach obstacle clearance surfaces protect aircraft executing a missed approach.*

2. *Vehicles that are less than 10 feet in height, necessary for the maintenance of the airport and/or navigation facilities operating outside the movement area, are exempt.*

c. If it is not possible to clear the POFZ or OCS prior to an aircraft reaching a point 2 miles from the runway threshold and the weather is less than described in subpara a or b above, issue traffic to the landing aircraft.

**NOTE–**

*The POFZ and/or OCS must be cleared as soon as practical.*

**PHRASEOLOGY–**

**(ACID), IN THE EVENT OF MISSED APPROACH (issue traffic).**

**TAXIING AIRCRAFT/VEHICLE LEFT/RIGHT OF RUNWAY.**

**EXAMPLE–**

*“United 623, in the event of missed approach, taxiing aircraft right of runway.”*

*“Delta 1058, in the event of missed approach, vehicle left of runway.”*

**REFERENCE–**

*FAA Order JO 7110.65, Para 3–1–6, Traffic Information.  
AC150/5300–13, Airport Design*

## Section 9. Departure Procedures and Separation

### 3-9-1. DEPARTURE INFORMATION

Provide current departure information, as appropriate, to departing aircraft.

**a.** Departure information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code.

**b.** Issue departure information by including the following:

**1.** Runway in use. (May be omitted if pilot states “have the numbers.”)

**2.** Surface wind from direct readout dial, wind shear detection system, or automated weather observing system information display. (May be omitted if pilot states “have the numbers.”)

**3.** Altimeter setting. (May be omitted if pilot states “have the numbers.”)

**REFERENCE–**

*FAA Order JO 7110.65, Para 2-7-1, Current Settings.*

**c.** Time, when requested.

**d.** Issue the official ceiling and visibility, when available, to a departing aircraft before takeoff as follows:

**1.** To a VFR aircraft when weather is below VFR conditions.

**2.** To an IFR aircraft when weather is below VFR conditions or highest takeoff minima, whichever is greater.

**NOTE–**

*Standard takeoff minimums are published in 14 CFR Section 91.175(f). Takeoff minima other than standard are prescribed for specific airports/runways and published in a tabular form supplement to the FAA instrument approach procedures charts and appropriate FAA Forms 8260.*

**e.** Issue the route for the aircraft/vehicle to follow on the movement area in concise and easy to understand terms. The taxi clearance must include the specific route to follow.

**f.** *USAF NOT APPLICABLE.* An advisory to “check density altitude” when appropriate.

**REFERENCE–**

*FAA Order JO 7210.3, Para 2-10-6, Broadcast Density Altitude Advisory.*

**g.** Issue braking action for the runway in use as received from pilots when braking action advisories are in effect.

**REFERENCE–**

*FAA Order JO 7110.65, Para 2-7-2, Altimeter Setting Issuance Below Lowest Usable FL.*

*FAA Order JO 7110.65, Para 3-1-8, Low Level Wind*

*Shear/Microburst Advisories.*

*FAA Order JO 7110.65, Para 3-3-5, Braking Action Advisories.*

*P/CG Term– Braking Action Advisories.*

**h.** Runway Condition Codes. Furnish RwyCC, as received from the Airport Operator, to aircraft via the ATIS.

**i.** For opposite direction departure operations, controllers may verbally issue the RwyCC, as identified in the FICON NOTAM, in reverse order. Controllers must not include reversed RwyCC on the ATIS broadcast.

**j.** When the ATIS is unavailable, and when the runway length available for departure has been temporarily shortened, controllers must ensure that pilots receive the runway number combined with a shortened announcement for all departing aircraft.

**PHRASEOLOGY–**

*RUNWAY (NUMBER) SHORTENED*

**EXAMPLE–**

*“Runway Two-Seven shortened.”*

### 3-9-2. DEPARTURE DELAY INFORMATION

USA/USAF/USN NOT APPLICABLE

When gate-hold procedures are in effect, issue the following departure delay information as appropriate:

**REFERENCE–**

*FAA Order JO 7210.3, Para 10-4-3, Gate Hold Procedures.*

**a.** Advise departing aircraft the time at which the pilot can expect to receive engine startup advisory.

**PHRASEOLOGY–**

*GATE HOLD PROCEDURES ARE IN EFFECT. ALL AIRCRAFT CONTACT (position) ON (frequency) FOR ENGINE START TIME. EXPECT ENGINE START/TAXI (time).*

**b.** Advise departing aircraft when to start engines and/or to advise when ready to taxi.

**PHRASEOLOGY–**

*START ENGINES, ADVISE WHEN READY TO TAXI,*

or

**ADVISE WHEN READY TO TAXI.**

c. If the pilot requests to hold in a delay absorbing area, the request must be approved if space and traffic conditions permit.

d. Advise all aircraft on GC/FD frequency upon termination of gate hold procedures.

**PHRASEOLOGY–**

*GATE HOLD PROCEDURES NO LONGER IN EFFECT.*

**3–9–3. DEPARTURE CONTROL INSTRUCTIONS**

Inform departing IFR, SVFR, VFR aircraft receiving radar service, and TRSA VFR aircraft of the following:

**a. Before takeoff.**

1. Issue the appropriate departure control frequency and beacon code. The departure control frequency may be omitted if a SID has been or will be assigned and the departure control frequency is published on the SID.

**PHRASEOLOGY–**

*DEPARTURE FREQUENCY (frequency), SQUAWK (code).*

2. Inform all departing IFR military turboprop/turbojet aircraft (except transport and cargo types) to change to departure control frequency. If the local controller has departure frequency override, transmit urgent instructions on this frequency. If the override capability does not exist, transmit urgent instructions on the emergency frequency.

**PHRASEOLOGY–**

*CHANGE TO DEPARTURE.*

3. **USAF.** USAF control towers are authorized to inform all departing IFR military transport/cargo type aircraft operating in formation flight to change to departure control frequency before takeoff.

**b. After takeoff.**

1. When the aircraft is about  $\frac{1}{2}$  mile beyond the runway end, instruct civil aircraft, and military transport, and cargo types to contact departure control, provided further communication with you is not required.

2. Do not request departing military turboprop/turbojet aircraft (except transport and cargo types) to

make radio frequency or radar beacon changes before the aircraft reaches 2,500 feet above the surface.

**REFERENCE–**

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

**3–9–4. LINE UP AND WAIT (LUAW)**

a. The intent of LUAW is to position aircraft for an imminent departure. Authorize an aircraft to line up and wait, except as restricted in subpara g, when takeoff clearances cannot be issued because of traffic. Issue traffic information to any aircraft so authorized. Traffic information may be omitted when the traffic is another aircraft which has landed on or is taking off the runway and is clearly visible to the holding aircraft. Do not use conditional phrases such as “behind landing traffic” or “after the departing aircraft.”

b. First state the runway number followed by the line up and wait clearance.

**PHRASEOLOGY–**

*RUNWAY (number), LINE UP AND WAIT.*

**NOTE–**

*When using LUAW, an imminent departure is one that will not be delayed beyond the time that is required to ensure a safe operation. An aircraft should not be in LUAW status for more than 90 seconds without additional instructions.*

**c. Procedures.**

1. At facilities without a safety logic system or facilities with the safety logic system in the limited configuration:

(a) Do not issue a landing clearance to an aircraft requesting a full-stop, touch-and-go, stop-and-go, option, or unrestricted low approach on the same runway with an aircraft that is holding in position or taxiing to line up and wait until the aircraft in position starts takeoff roll.

**PHRASEOLOGY–**

*RUNWAY (number), CONTINUE, TRAFFIC HOLDING IN POSITION,*

or

*RUNWAY (number) (pattern instructions as appropriate) TRAFFIC HOLDING IN POSITION.*

**EXAMPLE–**

*“American 528, Runway Two–Three continue, traffic holding in position.”*

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

*“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 any time 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.**

**1. 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 needs 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:

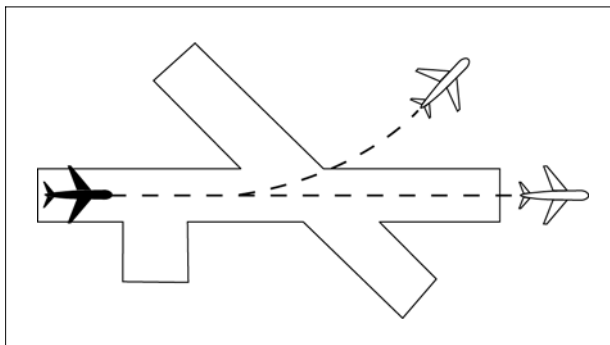
**a.** The other aircraft has departed and crossed the runway end or turned to avert any conflict. (See FIG 3–9–1.) If you can determine distances by



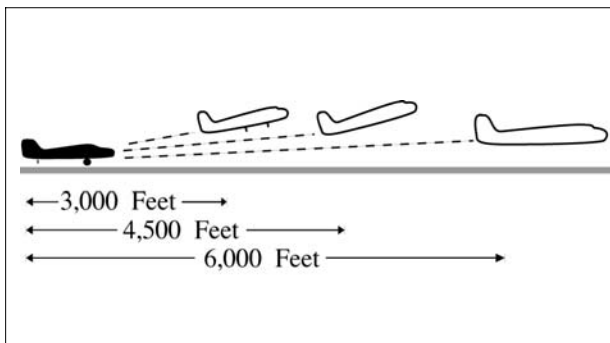
reference to suitable landmarks, the other aircraft needs only be airborne if the following minimum distance exists between aircraft: (See FIG 3-9-2.)

1. When only Category I aircraft are involved—3,000 feet.
2. When a Category I aircraft is preceded by a Category II aircraft—3,000 feet.
3. When either the succeeding or both are Category II aircraft—4,500 feet.
4. When either is a Category III aircraft—6,000 feet.
5. When the succeeding aircraft is a helicopter, visual separation may be applied in lieu of using distance minima.

**FIG 3-9-1**  
**Same Runway Separation**  
**[View 1]**



**FIG 3-9-2**  
**Same Runway Separation**  
**[View 2]**



**NOTE—**

Aircraft same runway separation (SRS) categories are specified in FAA Order JO 7360.1, Aircraft Type Designators and based upon the following definitions:

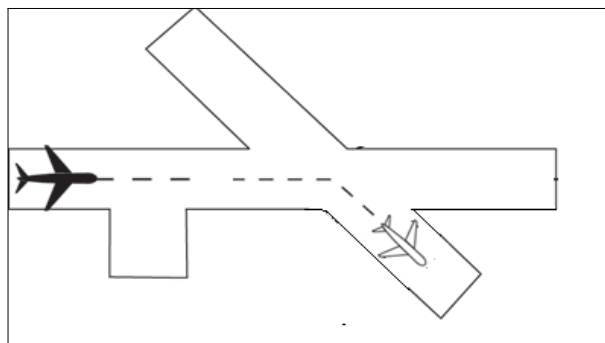
*CATEGORY I — small single-engine propeller driven aircraft weighing 12,500 lbs. or less, and all helicopters.*

*CATEGORY II — small twin-engine propeller driven aircraft weighing 12,500 lbs. or less.*

*CATEGORY III — all other aircraft.*

- b. A preceding landing aircraft is clear of the runway. (See FIG 3-9-3.)

**FIG 3-9-3**  
**Preceding Landing Aircraft Clear of Runway**



**REFERENCE—**

*P/CG Term— Clear of the Runway.*

**WAKE TURBULENCE APPLICATION**

- c. Do not issue clearances which imply or indicate approval of rolling takeoffs by super or heavy aircraft except as provided in Paragraph 3-1-14, Ground Operations When Volcanic Ash is Present.

- d. Do not issue clearances to a small aircraft to line up and wait on the same runway behind a departing super or heavy aircraft to apply the necessary intervals.

**REFERENCE—**

*AC 90-23, Aircraft Wake Turbulence.*

- e. The minima in Paragraph 5-5-4, Minima, subparagraph g, may be applied in lieu of the time interval requirements in subparagraphs f, g, and h. When Paragraph 5-5-4, Minima, is applied, ensure that the appropriate radar separation exists at or prior to the time an aircraft becomes airborne.

**REFERENCE—**

*FAA Order JO 7210.3, Para 2-1-15, Authorization for Separation Services by Towers.*

*FAA Order JO 7210.3, Para 10-5-3, Functional Use of Certified Tower radar Displays.*

**NOTE—**

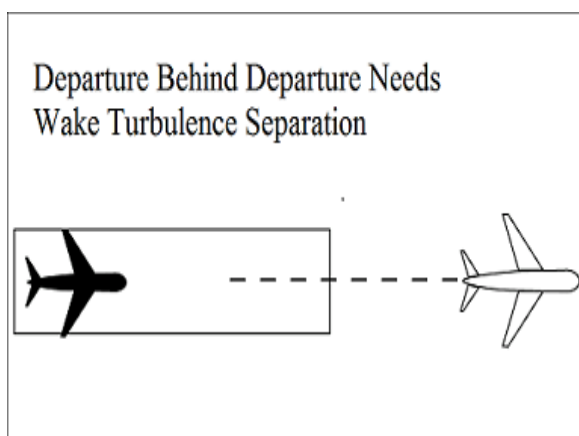
1. The pilot may request additional separation, but should make this request before taxiing on the runway.

2. Takeoff clearance to the following aircraft should not be issued until the time interval has passed after the preceding aircraft begins takeoff roll.

f. Separate aircraft taking off from the same runway or a parallel runway separated by less than 2,500 feet (See FIG 3-9-4):

1. Heavy, large, or small behind super – 3 minutes.
2. Heavy, large, or small behind heavy – 2 minutes.

FIG 3-9-4  
Same Runway Separation



g. Separate a small behind a B757 aircraft by 2 minutes when departing:

1. The same runway or a parallel runway separated by less than 700 feet. (See FIG 3-9-5 and FIG 3-9-6.)

FIG 3-9-5  
Same Runway Separation

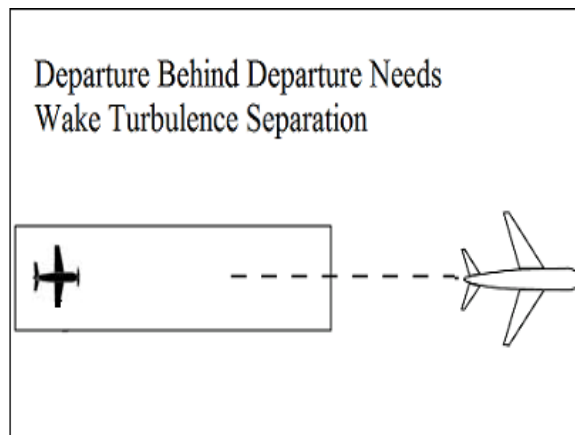
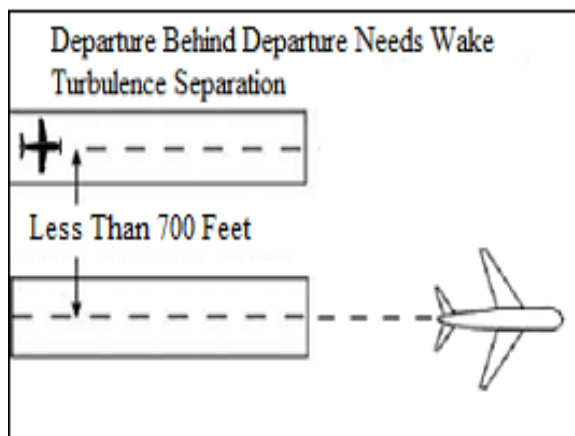


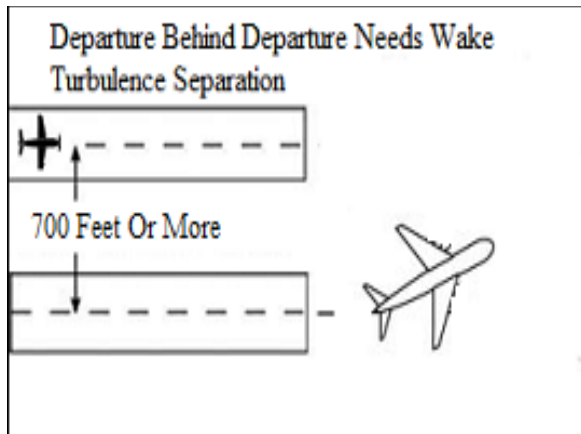
FIG 3-9-6  
Parallel Runway Separated by Less than 700 Feet



2. A parallel runway separated by 700 feet or more if projected flight paths will cross. (See FIG 3-9-7).

FIG 3-9-7

**Parallel Runway Separated by 700 Feet or More  
Projected Flight Paths Cross**

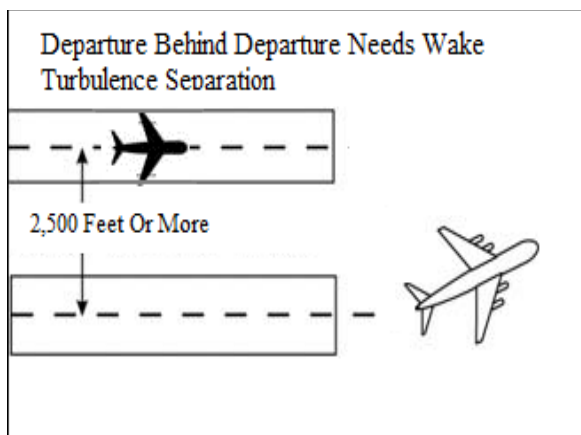


**h.** Separate aircraft departing from a parallel runway separated by 2,500 feet or more if projected flight paths will cross (See FIG 3-9-8):

1. Heavy, large, or small behind super – 3 minutes.
2. Heavy, large, or small behind heavy – 2 minutes.

FIG 3-9-8

**Parallel Runways Separated by 2,500 feet or More**



**i.** Separate aircraft when operating on a runway with a displaced landing threshold if projected flight paths will cross when either a departure follows an arrival or an arrival follows a departure by the following minima:

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

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

3. Small behind B757 – 2 minutes.

**j.** Separate an aircraft behind another aircraft that has departed or made a low/missed approach when utilizing opposite direction takeoffs or landings on the same or parallel runways separated by less than 2,500 feet by the following minima:

1. Heavy, large, or small behind super – 4 minutes.

2. Heavy, large, or small behind heavy – 3 minutes

**k.** Separate a small aircraft behind a B757 that has departed or made a low/missed approach by 3 minutes when utilizing opposite direction takeoffs or landings from:

1. The same runway or a parallel runway separated by less than 700 feet.

2. A parallel runway separated by 700 feet or more if projected flight paths will cross.

**l.** Do not approve pilot requests to deviate from the required intervals contained in subparagraphs f through k.

**PHRASEOLOGY–**

**HOLD FOR WAKE TURBULENCE.**

**REFERENCE–**

FAA Order JO 7110.65, Para 3-9-7, Wake Turbulence Separation for Intersection Departures.

**m.** Separate a small aircraft behind a large aircraft (except B757) that has departed or made a low/missed approach when utilizing opposite direction takeoffs on the same runway by 3 minutes unless a pilot has initiated a request to deviate from the time interval. In the latter case, issue a wake turbulence cautionary advisory before clearing the aircraft for takeoff. Controllers must not initiate or suggest a waiver of the time interval.

**NOTE–**

A request for takeoff does not initiate a waiver request.

**n.** Inform aircraft when it is necessary to hold in order to provide the required time interval.

**3-9-7. WAKE TURBULENCE SEPARATION FOR INTERSECTION DEPARTURES**

**a.** Apply the following wake turbulence criteria for intersection departures:

1. Separate a small aircraft weighing 12,500 lbs. or less taking off from an intersection on the same runway (same or opposite direction takeoff) behind a departing small aircraft weighing more than 12,500 lbs. by ensuring that the aircraft does not start takeoff roll until at least 3 *minutes* after the preceding aircraft has taken off.

2. Separate a small aircraft taking off from an intersection on the same runway (same or opposite direction takeoff) behind a departing large aircraft (except B757) by ensuring that the aircraft does not start takeoff roll until at least 3 *minutes* after the preceding aircraft has taken off.

3. Separate a small aircraft taking off from an intersection (same or opposite direction takeoff) behind a preceding departing B757 aircraft by ensuring that the small aircraft does not start takeoff roll until at least 3 *minutes* after the B757 has taken off from:

(a) The same runway or a parallel runway separated by less than 700 feet.

(b) Parallel runways separated by 700 feet or more, or parallel runways separated by 700 feet or more with the runway thresholds offset by 500 feet or more, if projected flight paths will cross.

4. Separate aircraft departing from an intersection on the same runway (same or opposite direction takeoff), parallel runways separated by less than 2,500 feet, and parallel runways separated by less than 2,500 feet with the runway thresholds offset by 500 feet or more, by ensuring that the aircraft does not start take-off roll until the following intervals exist after the preceding aircraft has taken off:

**NOTE–**

*Apply Para 3-9-6, Same Runway Separation, subpara f to parallel runways separated by less than 2,500 feet with runway thresholds offset by less than 500 feet.*

(a) Heavy, large, or small behind super - 4 *minutes*.

(b) Heavy, large, or small behind heavy - 3 *minutes*.

5. Inform aircraft when it is necessary to hold in order to provide the required time interval.

**PHRASEOLOGY–**

**HOLD FOR WAKE TURBULENCE.**

**NOTE–**

*Aircraft conducting touch-and-go and stop-and-go operations are considered to be departing from an intersection.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 3-8-2, Touch-and-Go or Stop-and-Go or Low Approach.*

b. The time interval is not required when:

1. A pilot has initiated a request to deviate from the time intervals contained in subpara a1 or a2.

**NOTE–**

*A request for takeoff does not initiate a waiver request; the request for takeoff must be accomplished by a request to deviate from the time interval.*

2. USA NOT APPLICABLE. The intersection is 500 feet or less from the departure point of the preceding aircraft and both aircraft are taking off in the same direction.

3. Successive touch-and-go or stop-and-go operations are conducted with any aircraft following an aircraft in the pattern that requires wake turbulence separation, or an aircraft departing the same runway that requires wake turbulence separation in accordance with subparas a1, a2, a3, or a4 (except for super aircraft), provided the pilot is maintaining visual separation/spacing behind the preceding aircraft. Issue a wake turbulence cautionary advisory and the position of the larger aircraft.

**NOTE–**

*Not authorized with a Super as the lead or departure aircraft.*

**REFERENCE–**

*FAA Order JO 7110.65, Para 5-5-4, Minima, subpar g.*

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

4. If action is initiated to reduce the separation between successive touch-and-go or stop-and-go operations, apply the appropriate separation contained in subpara a1, a2, a3, or a4.

c. When applying the provision of subpara b:

1. Issue a wake turbulence advisory before clearing the aircraft for takeoff.

2. Do not clear the intersection departure for an immediate takeoff.

3. Issue a clearance to permit the trailing aircraft to deviate from course enough to avoid the flight path of the preceding aircraft when applying subpara b1 or b2.

4. Separation requirements in accordance with Para 3-9-6, Same Runway Separation, must also apply.

**REFERENCE-**

FAA Order JO 7110.65, Para 3-9-6, Same Runway Separation.

### 3-9-8. INTERSECTING RUNWAY/INTERSECTING FLIGHT PATH OPERATIONS

a. Issue traffic information to each aircraft operating on intersecting runways.

b. Separate departing aircraft from another aircraft using an intersecting runway by ensuring that the departure does not begin takeoff roll until one of the following exists:

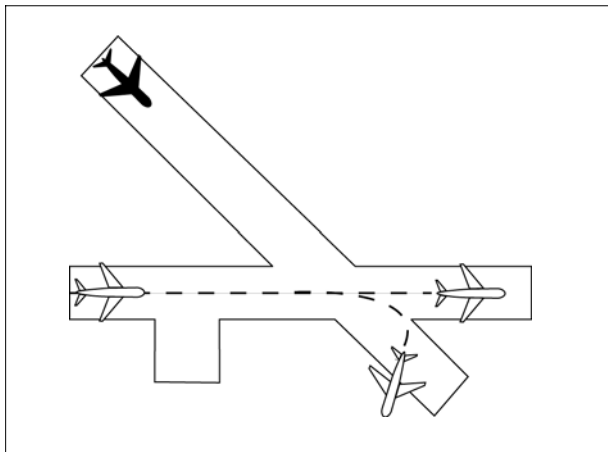
**REFERENCE-**

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

1. The preceding aircraft has departed and passed the intersection or is turning to avert any conflict. (See FIG 3-9-9).

FIG 3-9-9

Intersecting Runway Separation



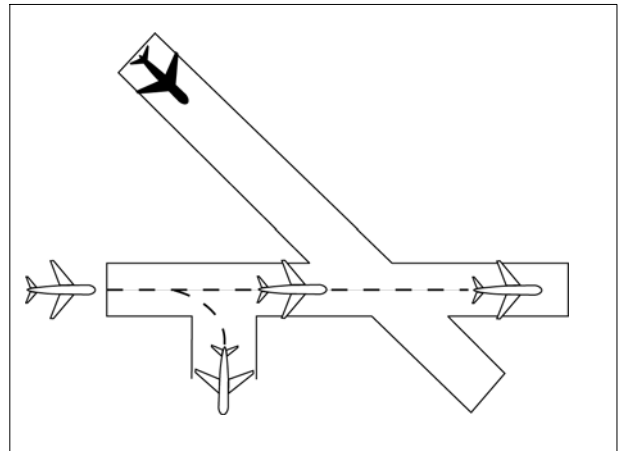
2. A preceding arriving aircraft is clear of the landing runway, completed the landing roll and will hold short of the intersection, or has passed the intersection. (See FIG 3-9-10).

**REFERENCE-**

P/CG Term- Clear of the Runway.

FIG 3-9-10

Intersecting Runway Separation



### WAKE TURBULENCE APPLICATION

3. Separate aircraft taking off behind a departing or landing aircraft on an intersecting runway if flight paths will cross (See FIG 3-9-11 and FIG 3-9-12):

**NOTE-**

Takeoff clearance to the following aircraft should not be issued until the appropriate time interval has passed after the preceding aircraft began takeoff roll.

(a) Heavy, large, or small behind super – 3 minutes.

(b) Heavy, large, or small behind heavy – 2 minutes.

(c) Small behind B757 – 2 minutes.

FIG 3-9-11

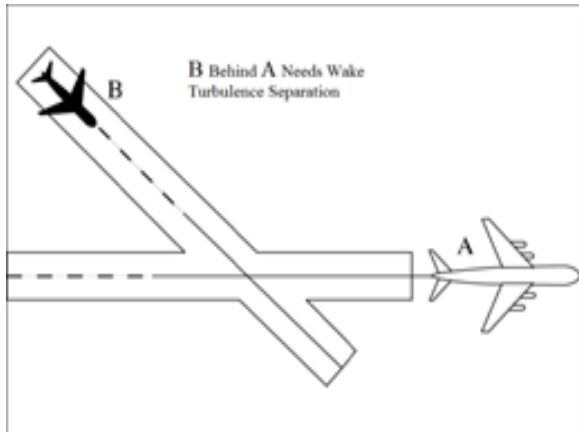
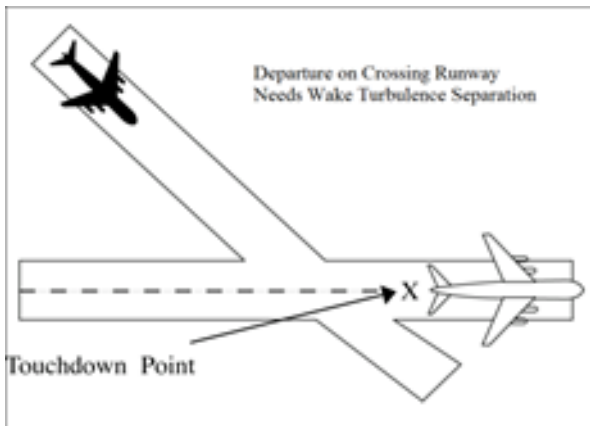
**Departure Behind Departure on Intersecting Runway**

FIG 3-9-12

**Departure Behind Arrival on Intersecting Runway**

4. Pilot requests to deviate from the required time intervals must not be approved if the preceding aircraft requires wake turbulence separation.

**REFERENCE—**

FAA Order JO 7110.65, Para 5-5-4, Minima, Subparagraph g.

**3-9-9. NONINTERSECTING CONVERGING RUNWAY OPERATIONS**

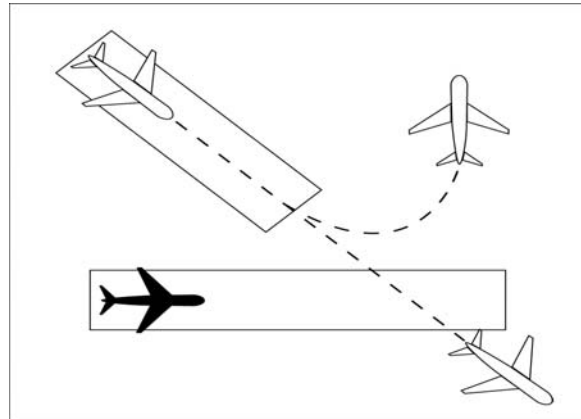
a. Separate departing aircraft from an aircraft using a nonintersecting runway when the flight paths intersect by ensuring that the departure does not begin takeoff roll until one of the following exists:

**REFERENCE—**

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

1. The preceding aircraft has departed and crossed the departure runway, or is turning to avert any conflict. (See FIG 3-9-13).

FIG 3-9-13

**Intersecting Runway Separation**

2. A preceding arriving aircraft has completed the landing roll and will hold short of the projected intersection, passed the projected intersection, or has crossed over the departure runway (See FIG 3-9-14 and FIG 3-9-15 ).

FIG 3-9-14

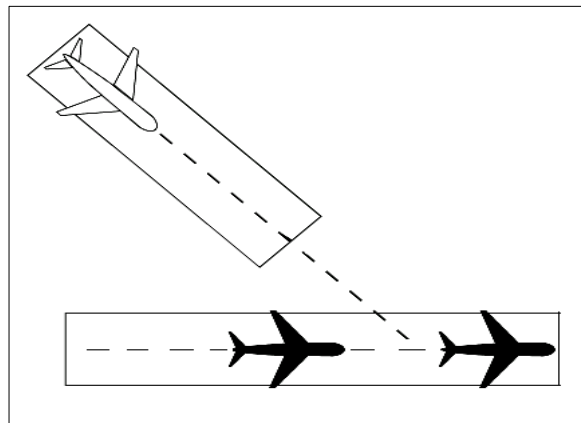
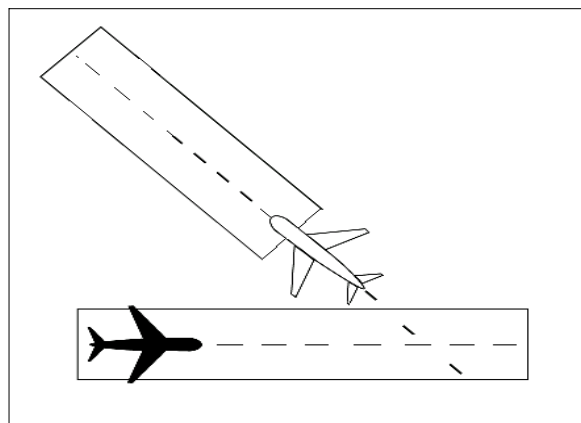
**Intersecting Runway Separation**

FIG 3-9-15

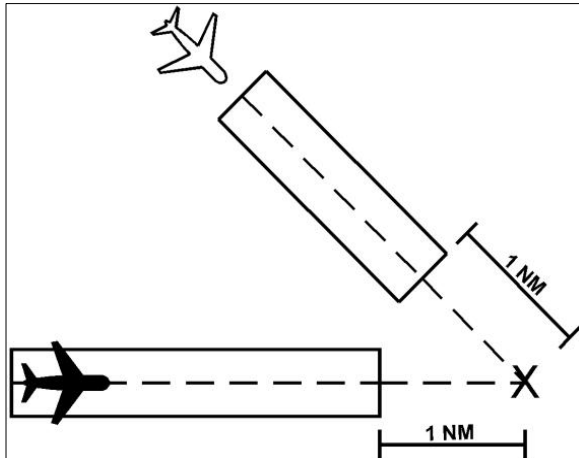
**Intersecting Runway Separation**

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.)

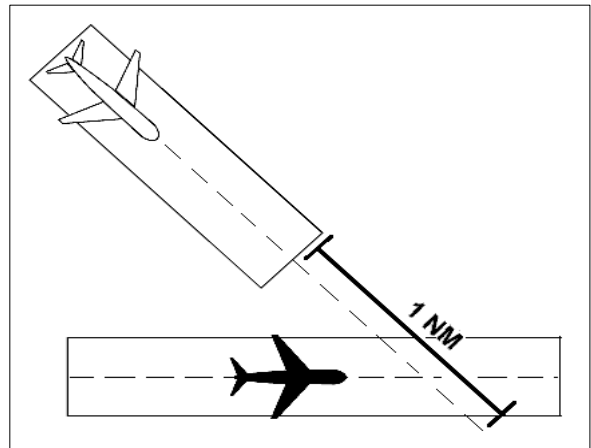
**REFERENCE-**

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**

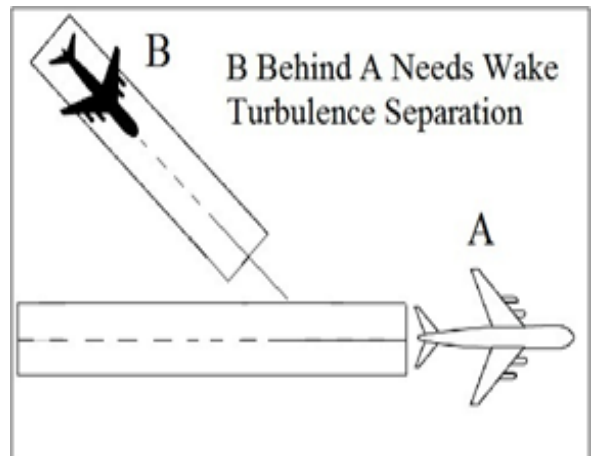


**WAKE TURBULENCE APPLICATION**

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-**

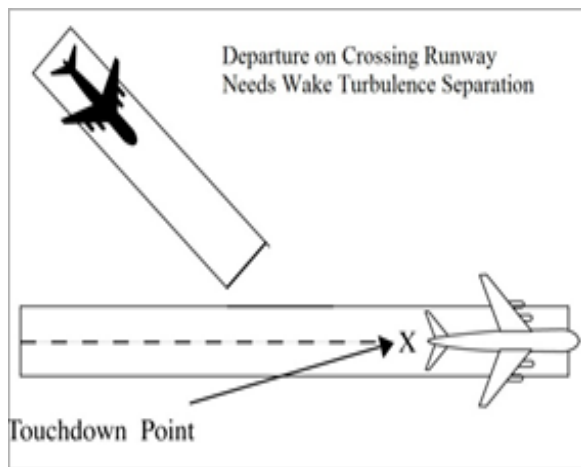
Takeoff clearance to the following aircraft should not be

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–**

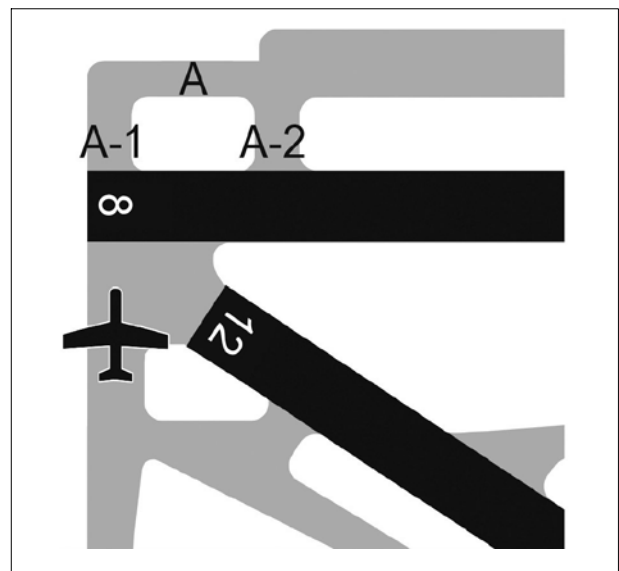
RUNWAY (number), FULL LENGTH, CLEARED FOR TAKEOFF.

**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 3-9-9e.

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



between runways, state the runway to be crossed with the takeoff clearance if the aircraft is not able to complete a runway crossing before reaching its departure runway.

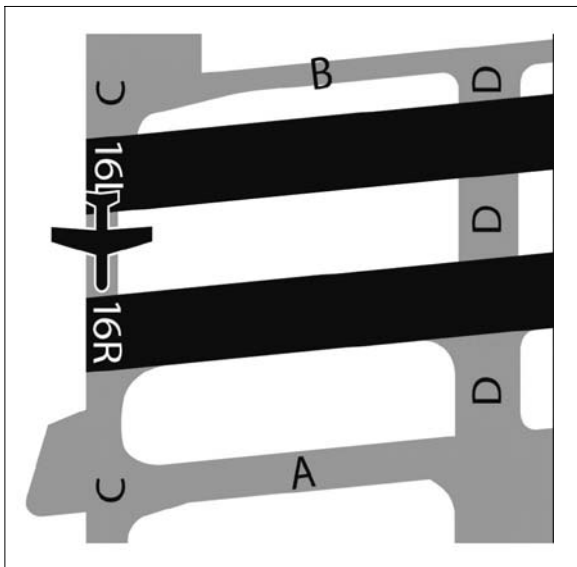
**PHRASEOLOGY–**

*CROSS RUNWAY (number), RUNWAY (number) CLEARED FOR TAKEOFF.*

**EXAMPLE–**

*“CROSS RUNWAY TWO FOUR LEFT, RUNWAY TWO FOUR RIGHT, CLEARED FOR TAKEOFF.”*

**FIG 3–9–21**  
**Runway/Taxiway Proximity**



**REFERENCE–**

FAA Order JO 7210.3, Para 10–3–9, Takeoff Clearance.  
P/CG Term– Clear of the Runway.

**f.** Do not use the term “full length” when the runway length available for departure has been temporarily shortened. On permanently shortened runways, do not use the term “full length” until the 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.*

**g.** Whenever a runway length has been temporarily or permanently shortened, state the word “shortened” immediately following the runway number as part of the takeoff clearance. This information must be issued in conjunction with the takeoff clearance.

**1.** The addition of “shortened” must be included in the takeoff clearance for the duration of the construction project when the runway is temporarily shortened.

**2.** The addition of “shortened” must be included in the takeoff clearance until the Chart Supplement U.S. is updated to include the change(s) when the runway is permanently shortened.

**PHRASEOLOGY–**

*RUNWAY (number) SHORTENED, CLEARED FOR TAKEOFF.*

**EXAMPLE–**

*“Runway Two-Seven shortened, cleared for takeoff.”*

**PHRASEOLOGY–**

*RUNWAY (number) AT (taxiway designator) INTERSECTION DEPARTURE SHORTENED, CLEARED FOR TAKEOFF.*

**EXAMPLE–**

*“Runway Two-Seven at Juliet, intersection departure shortened, cleared for takeoff.”*

**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

**h. USAF.** When an aircraft is cleared for takeoff, inform it of the closest traffic within 6 miles on final approach to the same runway. If the approaching aircraft is on a different frequency, inform it of the departing aircraft.

**i. USA/USN/USAF.** Issue surface wind and takeoff clearance to aircraft.

**PHRASEOLOGY–**

*RUNWAY (number), WIND (surface wind in direction and velocity). CLEARED FOR TAKEOFF.*

### 3–9–11. CANCELLATION OF TAKEOFF CLEARANCE

Cancel a previously issued clearance for takeoff and inform the pilot of the reason if circumstances require. Once an aircraft has started takeoff roll, cancel the takeoff clearance only for the purpose of safety.

**NOTE–**

*In no case should a takeoff clearance be canceled after an aircraft has started its takeoff roll solely for the purpose of meeting traffic management requirements/EDCT.*

**PHRASEOLOGY–**

*CANCEL TAKEOFF CLEARANCE (reason).*



## 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

Aircraft Operating	On course degrees magnetic	Assign	Examples
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

**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 Symbolology, 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.

**PHRASEOLOGY–**

(Airport) *ARRIVAL DELAYS* (time in minutes/hours).

**4-6-4. HOLDING INSTRUCTIONS**

When issuing holding instructions, specify:

- a. Direction of holding from the fix/waypoint.
- b. Holding fix or waypoint.

**NOTE–**

*The holding fix may be omitted if included at the beginning of the transmission as the clearance limit.*

c. Radial, course, bearing, track, azimuth, airway, or route on which the aircraft is to hold.

d. Leg length in miles if DME or RNAV is to be used. Specify leg length in minutes if the pilot requests it or you consider it necessary.

e. Direction of holding pattern turns only if left turns are to be made, the pilot requests it, or you consider it necessary.

**PHRASEOLOGY–**

*HOLD (direction) OF (fix/waypoint) ON (specified radial, course, bearing, track, airway, azimuth(s), or route.)*

*If leg length is specified,*

*(number of minutes/miles) MINUTE/MILE LEG.*

*If direction of turn is specified,*

*LEFT/RIGHT TURNS.*

f. Issue maximum holding airspeed advisories when an aircraft is:

- 1. Approved to exceed the maximum airspeed of a pattern, and is cleared into a holding pattern that will protect for the greater speed; or
- 2. Observed deviating from the holding pattern airspace area; or
- 3. Cleared into an airspeed restricted holding pattern in which the icon has not been published.

**EXAMPLE–**

*Due to turbulence, a turboprop requests to exceed the recommended maximum holding airspeed. ATCS may clear the aircraft into a pattern that protects for the airspeed request, and must advise the pilot of the maximum holding airspeed for the holding pattern airspace area.*

**PHRASEOLOGY–**

*“MAXIMUM HOLDING AIRSPEED IS TWO ONE ZERO KNOTS.”*

**4-6-5. VISUAL HOLDING POINTS**

You may use as a holding fix a location which the pilot can determine by visual reference to the surface if he/she is familiar with it.

**PHRASEOLOGY–**

*HOLD AT (location) UNTIL (time or other condition.)*

**REFERENCE–**

*FAA Order JO 7110.65, Para 7-1-4, Visual Holding of VFR Aircraft.*

**4-6-6. HOLDING FLIGHT PATH DEVIATION**

Approve a pilot's request to deviate from the prescribed holding flight path if obstacles and traffic conditions permit.

**4-6-7. UNMONITORED NAVAIDS**

Separate an aircraft holding at an unmonitored NAVAID from any other aircraft occupying the course which the holding aircraft will follow if it does not receive signals from the NAVAID.

**4-6-8. ILS PROTECTION/CRITICAL AREAS**

When the official weather observation indicates a ceiling of less than 800 feet or visibility of 2 miles, do not authorize aircraft to hold below 5,000 feet AGL inbound toward the airport on or within 1 statute mile of the localizer between the ILS OM or the fix used in lieu of the OM and the airport. *USAF.* The holding restriction applies only when an arriving aircraft is between the ILS OM or the fix used in lieu of the OM and the runway.

**REFERENCE–**

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



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 inter-facility 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 JO 7110.65 Chapter 10, Section 1, Paragraph 10-1-1c.

**NOTE-**

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

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

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

## 5-2-10. VFR CODE ASSIGNMENTS

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

**NOTE-**

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

2. Paragraph 5-2-6, Function Code Assignments, specifies the function code allocation from which an appropriate code for the aircraft indicated in subpara a should be selected. In the terminal environment, additional

function codes may be authorized by the appropriate service area office.

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

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

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

**NOTE-**

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

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

**PHRASEOLOGY-**

SQUAWK VFR.

or

SQUAWK 1200.

**NOTE-**

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

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

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

**REFERENCE-**

FAA Order 7110.66, National Beacon Code Allocation Plan.

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



**REFERENCE–**

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

## **5–2–11. BEACON CODE FOR PRESSURE SUIT FLIGHTS AND FLIGHTS ABOVE FL 600**

a. Mode 3/A, **Code 4400**, and discrete **Codes 4440 through 4465** are reserved for use by R–71, F–12, U–2, B–57, pressure suit flights, and aircraft operations above FL 600.

**NOTE–**

*The specific allocation of the special use codes in subset 4400 is in FAA Order 7110.66, National Beacon Code Allocation Plan.*

b. Ensure that aircraft remain on **Code 4400** or one of the special use discrete codes in the **4400** subset if filed as part of the flight plan. Except when unforeseen events, such as weather deviations, equipment failure, etc., cause more than one aircraft with same Mode 3/A discrete beacon codes to be in the same or adjacent ARTCC's airspace at the same time, a controller may request the pilot to make a code change, squawk standby, or to stop squawk as appropriate.

**NOTE–**

*Due to the inaccessibility of certain equipment to the flight crews, **Code 4400** or a discrete code from the **4400** subset is preset on the ground and will be used throughout the flight profile including operations below FL 600. Controllers should be cognizant that not all aircraft may be able to accept the transponder changes identified in the exception. Emergency **Code 7700**, however, can be activated.*

**REFERENCE–**

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

## **5–2–12. AIR DEFENSE EXERCISE BEACON CODE ASSIGNMENT**

**EN ROUTE**

Ensure exercise FAKER aircraft remain on the exercise flight plan filed discrete beacon code.

**NOTE–**

1. NORAD will ensure exercise FAKER aircraft flight plans are filed containing discrete beacon codes from the Department of Defense code allocation specified in FAA Order JO 7610.4, Special Operations, Appendix 6.

2. NORAD will ensure that those FAKER aircraft assigned the same discrete beacon code are not flight planned in the same or any adjacent ARTCC's airspace at the same time.

*(Simultaneous assignment of codes will only occur when operational requirements necessitate.)*

**REFERENCE–**

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

## **5–2–13. STANDBY OR LOW SENSITIVITY OPERATION**

You may instruct an aircraft operating on an assigned code to change transponder to “standby” or “low sensitivity” position:

**NOTE–**

*National standards no longer require improved transponder to be equipped with the low sensitivity feature. Therefore, aircraft with late model transponders will be unable to respond to a request to “squawk low.”*

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

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

**PHRASEOLOGY–**

**SQUAWK STANDBY,**

or

**SQUAWK LOW/NORMAL.**

**REFERENCE–**

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

## **5–2–14. CODE MONITOR**

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

**REFERENCE–**

FAA Order JO 7110.65, Para 5–2–6, Function Code Assignments.

**NOTE–**

*In addition to alphanumeric and control symbology processing enhancements, the MEARTS and STARS systems are equipped with automatic beacon decoders. Therefore, in facilities where the automatic beacon decoders are providing the control slash video, there is no requirement to have the non-automated decoding equipment operating simultaneously.*

**REFERENCE–**

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

a. This includes the appropriate IFR code actually assigned and, additionally, **Code 1200**, **Code 1202**, **Code 1255**, and **Code 1277** unless your area of responsibility includes only Class A airspace. During periods when ring-around or excessive VFR target presentations derogate the separation of IFR traffic, the monitoring of VFR **Code 1200**, **Code 1202**, **Code 1255**, and **Code 1277** may be temporarily discontinued.

b. Positions of operation which contain or are immediately adjacent to a restricted area, warning area, VR route, or other categories where Code 4000 can be assigned must monitor **Code 4000** and any other code used in lieu of **4000**. If by local coordination with the restricted/warning area or VR route user a code other than 4000 is to be exclusively used, then this code must be monitored.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–2–6, Function Code Assignments.

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

**NOTE–**

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

**1. Code 7500** (hijack code).

**REFERENCE–**

FAA Order JO 7110.65, Para 10–2–6, Hijacked Aircraft.

**2. Code 7600** (loss of radio communications code).

**5–2–15. FAILURE TO DISPLAY ASSIGNED BEACON CODE OR INOPERATIVE/MALFUNCTIONING TRANSPONDER**

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

**PHRASEOLOGY–**

(Identification) **RESET TRANSPONDER**, **SQUAWK** (appropriate code).

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

**PHRASEOLOGY–**

(Identification) **YOUR TRANSPONDER APPEARS**

**INOPERATIVE/MALFUNCTIONING, RESET, SQUAWK** (appropriate code).

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

**REFERENCE–**

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

**5–2–16. INOPERATIVE OR MALFUNCTIONING INTERROGATOR**

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

**PHRASEOLOGY–**

(Name of facility or control function) **BEACON INTERROGATOR INOPERATIVE/MALFUNCTIONING**.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–1–3, Radar Use.

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

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

Disapprove a request or withdraw previously issued approval to operate in Class A airspace with a failed transponder solely on the basis of traffic conditions or other operational factors.

**REFERENCE–**

FAA Order JO 7110.65, Para 5–1–3, Radar Use.

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

**5–2–18. VALIDATION OF MODE C READOUT**

Ensure that Mode C altitude readouts are valid after accepting an interfacility handoff, initial track start, track start from coast/suspend tabular list, or during and after an unreliable Mode C readout, except as follows:

**NOTE–**

Consider a Mode C readout unreliable when any condition, not just those that display an indicator in the Data Block, exists that indicates that the Mode C may be in error.

a. CTRD–equipped tower cabs are not required to validate Mode C altitude readouts after accepting interfacility handoffs from TRACONs according to the procedures in Paragraph 5–4–3, Methods, subparagraph a4.

b. ERAM facilities are not required to validate Mode C altitude readouts after accepting interfacility handoffs from other ERAM facilities, except:

1. After initial track start or track start from coast is required, or

2. During and after the display of a missing, unreasonable, exceptional, or otherwise unreliable Mode C readout indicator.

c. Consider an altitude readout valid when:

1. It varies less than 300 feet from the pilot reported altitude, or

**PHRASEOLOGY–**

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

SAY ALTITUDE.

or

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

SAY FLIGHT LEVEL.

2. You receive a continuous readout from an aircraft on the airport and the readout varies by less than 300 feet from the field elevation, or

**NOTE–**

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

**REFERENCE–**

FAA Order JO 7110.65, Para 5–2–24, Altitude Filters.

FAA Order JO 7110.65, Para 5–14–5, Selected Altitude Limits.

FAA Order JO 7210.3, Para 11–2–3, Display Data.

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

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

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

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

**PHRASEOLOGY–**

*(Location) ALTIMETER (appropriate altimeter), VERIFY ALTITUDE.*

2. If the altitude readout continues to be invalid:

(a) Instruct the pilot to turn off the altitude-reporting part of his/her transponder and include the reason; and

(b) Notify the operations supervisor-in-charge of the aircraft call sign.

**PHRASEOLOGY–**

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

f. Whenever you observe an invalid Mode C readout at or above FL 180, unless the aircraft is descending below Class A airspace:

1. Verify that the pilot is using 29.92 inches of mercury as the altimeter setting and has accurately reported the altitude.

**PHRASEOLOGY–**

*VERIFY USING TWO NINER NINER TWO AS YOUR ALTIMETER SETTING.*

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

VERIFY FLIGHT LEVEL.

2. If the Mode C readout continues to be invalid:

(a) Instruct the pilot to turn off the altitude-reporting part of his/her transponder and include the reason; and

(b) Notify the operational supervisor-in-charge of the aircraft call sign.

**PHRASEOLOGY–**

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

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

**5–2–19. ALTITUDE CONFIRMATION–  
MODE C**

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

**NOTE–**

*For the purpose of this paragraph, “initial contact” means a pilot’s first radio contact with each sector/position.*

a. The pilot states the assigned altitude, or

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

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

**d. TERMINAL.** The aircraft was transferred to you from another sector/position within your facility (intrafacility).

**PHRASEOLOGY–**

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

*(In climbing/descending situations),*

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

VERIFY ASSIGNED ALTITUDE (altitude).

*or*

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

VERIFY ASSIGNED FLIGHT LEVEL (flight level).

**REFERENCE–**

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

**5–2–20. ALTITUDE CONFIRMATION–NON–MODE C**

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

**NOTE–**

*For the purpose of this paragraph, “initial contact” means a pilot’s first radio contact with each sector/position.*

1. The pilot states the assigned altitude, or
2. You assign a new altitude to a climbing or a descending aircraft, or
3. **TERMINAL.** The aircraft was transferred to you from another sector/position within your facility (intrafacility).

**PHRASEOLOGY–**

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

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

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

**PHRASEOLOGY–**

*(If the altitude read back is correct),*

AFFIRMATIVE (altitude).

*(If the altitude read back is not correct),*

**NEGATIVE. CLIMB/DESCEND AND MAINTAIN (altitude),**

*or*

**NEGATIVE. MAINTAIN (altitude).**

**REFERENCE–**

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

**5–2–21. AUTOMATIC ALTITUDE REPORTING**

Inform an aircraft when you want it to turn on/off the automatic altitude reporting feature of its transponder.

**PHRASEOLOGY–**

SQUAWK ALTITUDE,

*or*

STOP ALTITUDE SQUAWK.

**NOTE–**

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

**REFERENCE–**

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

**5–2–22. INFLIGHT DEVIATIONS FROM TRANSPONDER/MODE C REQUIREMENTS BETWEEN 10,000 FEET AND 18,000 FEET**

Apply the following procedures to requests to deviate from the Mode C transponder requirement by aircraft operating in the airspace of the 48 contiguous states and the District of Columbia at and above 10,000 feet MSL and below 18,000 feet MSL, excluding the airspace at and below 2,500 feet AGL.

**NOTE–**

**1.** 14 CFR Section 91.215(b) provides, in part, that all U.S. registered civil aircraft must be equipped with an operable, coded radar beacon transponder when operating in the altitude stratum listed above. Such transponders must have a Mode 3/A 4096 code capability, replying to Mode 3/A interrogation with the code specified by ATC, or a Mode S capability, replying to Mode 3/A interrogations with the code specified by ATC. The aircraft must also be equipped with automatic pressure altitude reporting equipment having a Mode C capability that automatically replies to Mode C interrogations by transmitting pressure altitude information in 100–foot increments.

**2.** The exception to 14 CFR Section 91.215 (b) is 14 CFR Section 91.215(b)(5) which states: except balloons,

*gliders, and aircraft without engine-driven electrical systems.*

**REFERENCE–**

FAA Order JO 7210.3, Chapter 19, Temporary Flight Restrictions.

a. Except in an emergency, do not approve inflight requests for authorization to deviate from 14 CFR Section 91.215(b)(5)(i) requirements originated by aircraft without transponder equipment installed.

b. Approve or disapprove other inflight deviation requests, or withdraw approval previously issued to such flights, solely on the basis of traffic conditions and other operational factors.

c. Adhere to the following sequence of action when an inflight VFR deviation request is received from an aircraft with an inoperative transponder or Mode C, or is not Mode C equipped:

1. Suggest that the aircraft conduct its flight in airspace unaffected by the CFRs.

2. Suggest that the aircraft file an IFR flight plan.

3. Suggest that the aircraft provide a VFR route of flight and maintain radio contact with ATC.

d. Do not approve an inflight deviation unless the aircraft has filed an IFR flight plan or a VFR route of flight is provided and radio contact with ATC is maintained.

e. You may approve an inflight deviation request which includes airspace outside your jurisdiction without the prior approval of the adjacent ATC sector/facility providing a transponder/Mode C status report is forwarded prior to control transfer.

f. Approve or disapprove inflight deviation requests within a reasonable period of time or advise when approval/disapproval can be expected.

**REFERENCE–**

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

## 5–2–23. BEACON TERMINATION

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

**PHRASEOLOGY–**

**STOP SQUAWK.**

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

**STOP SQUAWK (mode in use).**

**REFERENCE–**

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

## 5–2–24. ALTITUDE FILTERS

**TERMINAL**

Set altitude filters to display Mode C altitude readouts to encompass all altitudes within the controller's jurisdiction. Set the upper limits no lower than 1,000 feet above the highest altitude for which the controller is responsible. In those stratified positions, set the lower limit to 1,000 feet or more below the lowest altitude for which the controller is responsible. When the position's area of responsibility includes down to an airport field elevation, the facility will normally set the lower altitude filter limit to encompass the field elevation so that provisions of Paragraph 2–1–6, Safety Alert, and Paragraph 5–2–18, Validation of Mode C Readout, subpara c2 may be applied. Air traffic managers may authorize temporary suspension of this requirement when target clutter is excessive.

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

Inform an aircraft when the ADS-B transmitter appears to be inoperative or malfunctioning. Notify the OS/CIC of the aircraft call sign and location of aircraft.

**PHRASEOLOGY–**

*(Aircraft ID) YOUR ADS-B TRANSMITTER APPEARS TO BE INOPERATIVE / MALFUNCTIONING.*

## 5–2–26. ADS-B ALERTS

a. Call Sign Mis-Match (CSMM). A CSMM alert will occur when the ADS-B broadcast call sign does not match the flight plan call sign.

**PHRASEOLOGY–**

*(Aircraft ID) YOUR ADS-B CALL SIGN DOES NOT MATCH YOUR FLIGHT PLAN CALL SIGN.*

b. Duplicate ICAO Address. If the broadcast ICAO address is shared with one or more flights in the same ADS-B Service Area (regardless of altitude), and radar reinforcement is not available, target resolution may be lost on one or both targets. Notify the OS/CIC of the aircraft call sign and location of aircraft.

**NOTE–**

1. If this occurs controllers should ensure targets remain radar reinforced or at least 6 NMs apart.

*2. Duplicate ICAO Address Alerts appear as “DA” and are associated with the Data Block (DB) on STARS and CARTS systems. Duplicate ICAO Address Alerts appear as “DUP” and are associated with the DB on MEARTS systems. Duplicate ICAO Address Alerts appear as “Duplicate 24-bit Address” on ERAM systems.*

controller's area of jurisdiction unless otherwise specified by a LOA or a facility directive.

**3.** Restrictions issued to ensure separation are passed to the receiving controller.

**d.** After transferring communications, continue to comply with the requirements of subparas c1 and 2.

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

**f.** Comply with the provisions of Paragraph 2-1-17, Radio Communications Transfer, subparas a and b. To the extent possible, transfer communications when the transfer of radar identification has been accepted.

**NOTE-**

*Before the ARTS/STARS "modify/quick look" function is used to transfer radar identification, a facility directive which specifies communication transfer points is required.*

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

- 1.** Assigned heading.
- 2.** Air speed restrictions.
- 3.** Altitude information issued.
- 4.** Observed track or deviation from the last route clearance.
- 5.** The beacon code if different from that normally used or previously coordinated.
- 6.** Any other pertinent information.

**h.** Ensure that the data block is associated with the appropriate target.

**i.** Initiate verbal coordination to verify the position of primary or nondiscrete targets when using the automated handoff functions except for intrafacility handoffs using single-sensor systems or multisensor systems operating in a mosaic RDP mode.

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

**k.** Advise the receiving controller if radar monitoring is required.

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

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

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

## **5-4-6. RECEIVING CONTROLLER HANDOFF**

The receiving controller must:

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

**REFERENCE-**

*FAA Order JO 7110.65, Para 2-1-14, Coordinate Use of Airspace.*

*FAA Order JO 7110.65, Para 2-1-15, Control Transfer.*

*FAA Order JO 7110.65, Para 5-4-5, Transferring Controller Handoff.*

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

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

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

**REFERENCE-**

*FAA Order JO 7110.65, Para 5-9-5, Approach Separation Responsibility.*

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

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

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

**NOTE—**

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

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

f. Take the identified action prior to accepting control of a track when the following indicators are displayed in the data block:

1. "AMB" and "AM": advise the other facility that a disparity exists between the position declared by their computer and that declared by your CARTS/PIDP/STARS system.

2. "NAT", "NT," or "TU": advise the other facility if a disparity exists between the position declared by their computer and the actual target position.

3. "DATA", "CST", "NONE", "NX", "OLD", or "OL": initiate verbal coordination.

g. ERAM: Notify the OS when a MISM is displayed in the data block.

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

i. If you decide, *after* accepting the transfer of radar identification, to delay the aircraft's climb or descent through the vertical limits of the transferring controller's area of jurisdiction, advise the transferring controller of that decision as soon as possible.

## 5-4-7. POINT OUT

a. The transferring controller must:

1. Obtain approval before permitting an aircraft to enter the receiving controller's delegated airspace.

(a) EN ROUTE: Automated approval may be utilized in lieu of verbal approval. If the receiving controller takes no action, revert to verbal procedures.

**NOTE—**

1. Use fourth line data for aircraft not on their flight plan route.

2. Where specified in a letter of agreement, some facilities may restrict interfacility automated point outs.

**REFERENCE—**

FAA Order JO 7110.65, Para 2-10-1, En Route Or Oceanic Sector Team Responsibilities.

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

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

FAA Order JO 7110.65, Para 5-14-3, Computer Entry of Flight Plan Information.

(b) TERMINAL: Automated point out approval may be utilized in lieu of verbal provided the procedures are contained in a facility directive/LOA.

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

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

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

b. The receiving controller must:

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

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

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



### 5-4-8. AUTOMATED INFORMATION TRANSFER (AIT)

Transfer radar identification, altitude control, and/or en route fourth line control information, without verbal coordination under the following conditions:

- a. During radar handoff; and
- b. Via information displayed in full data blocks; and
- c. When following procedures specified in your facility AIT directive and/or LOA.

#### NOTE-

*Information transferred using AIT procedures may be bi-directional, and may involve more than two sectors. Complete coordination, awareness of traffic flow, and understanding of each position's responsibilities concerning AIT procedures cannot be overemphasized.*

#### REFERENCE-

FAA Order JO 7110.65, Para 5-4-10, En Route Fourth Line Data Block Usage.  
FAA Order JO 7210.3, Para 4-3-8, Automated Information Transfer (AIT)

### 5-4-9. PREARRANGED COORDINATION

Prearranged coordination allowing aircraft under your control to enter another controller's area of jurisdiction may only be approved provided procedures are established and published in a facility directive/LOA in accordance with FAA Order JO 7210.3, Paragraph 3-6-7, Prearranged Coordination.

#### NOTE-

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

#### REFERENCE-

FAA Order JO 7110.65, Para 2-1-14, Coordinate Use of Airspace.  
FAA Order JO 7110.65, Para 5-4-3, Methods.  
FAA Order JO 7110.65, Para 5-4-8, Automated Information Transfer (AIT).  
FAA Order JO 7210.3, Para 3-6-7, Prearranged Coordination.

### 5-4-10. EN ROUTE FOURTH LINE DATA BLOCK USAGE

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

#### REFERENCE-

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

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

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

#### REFERENCE-

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

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

#### EXAMPLE-

H080, H270

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

#### EXAMPLE-

H080/ALB, 080/J121, PH/ALB

#### NOTE-

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

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

f. Coordination format for weather deviations must use the designated characters:

D-deviation

L-left

R-right

N-north  
 E-east  
 S-south  
 W-west  
 /F – direct next NAVAID/waypoint  
 D+2 headings – deviate between.

**NOTE–**

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

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

**EXAMPLE–**

D90/ATL, DL/KD75U, D090/F

3. The absence of a NAVAID, waypoint, or /F indicates that the pilot has been authorized to deviate for weather only, and the receiving controller must provide a clearance to rejoin the route in accordance with paragraph 2–1–15c.

**EXAMPLE–**

DN, D20L, D30R, D080+120

g. Coordination format for assigned airspeeds must use the designation character “S” preceding a three-digit number.

**NOTE–**

A “+” notation may be added to denote an assigned speed at or greater than the displayed value. A “–” notation may be added to denote an assigned speed at or less than the displayed value.

**EXAMPLE–**

S210, S250, S250+, S280–

h. Aircraft assigned a Mach number must use the designation “M” preceding the two-digit assigned value.

**EXAMPLE–**

M80, M80+, M80–

**REFERENCE–**

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

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

**EXAMPLE–**

CELNAV

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

**EXAMPLE–**

RQ170, RQ410

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

**EXAMPLE–**

RQ/LAX, RQ/NEUTO

l. The acceptance of a handoff by the receiving controller must constitute receipt of the information contained within the en route fourth line data block. This information must not be modified outside of the controller’s area of jurisdiction unless verbally coordinated or specified in a Letter of Agreement or Facility Directive. It is the responsibility of the receiving controller to advise the transferring controller if any information is not understood, or needs to be revised.

**NOTE–**

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

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

**EXAMPLE–**

1. Aircraft 1 was vectored to the final approach course but clearance was withheld. It is now at 4,000 feet and established on a segment of the instrument approach procedure. “Seven miles from X-RAY. Cleared I-L-S runway three six approach.” (See FIG 5–9–1.)

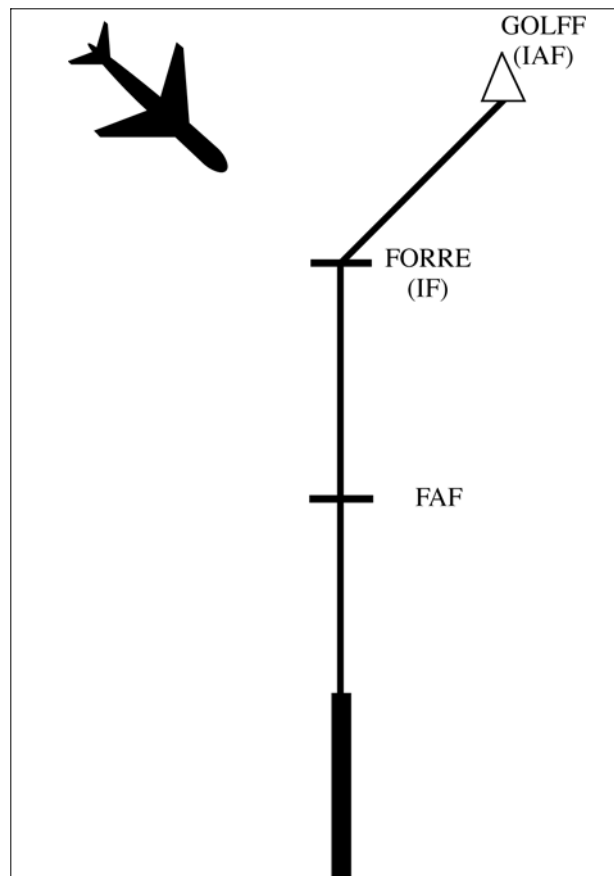
2. Aircraft 2 is being vectored to a published segment of the final approach course, 4 miles from LIMA at 2,000 feet. The MVA for this area is 2,000 feet. “Four miles from LIMA. Turn right heading three four zero. Maintain two thousand until established on the localizer. Cleared I-L-S runway three six approach.” (See FIG 5–9–1.)

3. Aircraft 3 is being vectored to intercept the final approach course beyond the approach segments, 5 miles from Alpha at 5,000 feet. the MVA for this area is 4,000 feet. “Five miles from Alpha. Turn right heading three three zero. Cross Alpha at or above four thousand. Cleared I-L-S runway three six approach.” (See FIG 5–9–1.)

4. Aircraft 4 is established on the final approach course beyond the approach segments, 8 miles from Alpha at 6,000 feet. The MVA for this area is 4,000 feet. “Eight miles from Alpha. Cross Alpha at or above four thousand. Cleared I-L-S runway three six approach.” (See FIG 5–9–1.)

2. Assigned an altitude to maintain until the aircraft is established on a segment of a published route or instrument approach procedure.

FIG 5–9–2  
Arrival Instructions

**EXAMPLE–**

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

**NOTE–**

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

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

3. Aircraft being vectored to the intermediate fix in FIG 5–9–2 must meet all the provisions described in subpara 4–8–1h2.

**d. Instructions to do one of the following:**

**NOTE—**

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

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

**2.** Contact the tower on local control frequency.

**REFERENCE—**

FAA Order JO 7110.65, Para 4–8–8, Communications Release.

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

**REFERENCE—**

FAA Order JO 7110.65, Para 5–10–8, Final Controller Changeover.

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

**EXAMPLE—**

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

“Over final approach fix. Contact tower one one eight point one.”

**NOTE—**

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

**REFERENCE—**

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

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

**e.** Where a Terminal Arrival Area (TAA) has been established to support RNAV approaches, inform the aircraft of its position relative to the appropriate IAF and issue the approach clearance. (See FIG 5–9–3.)

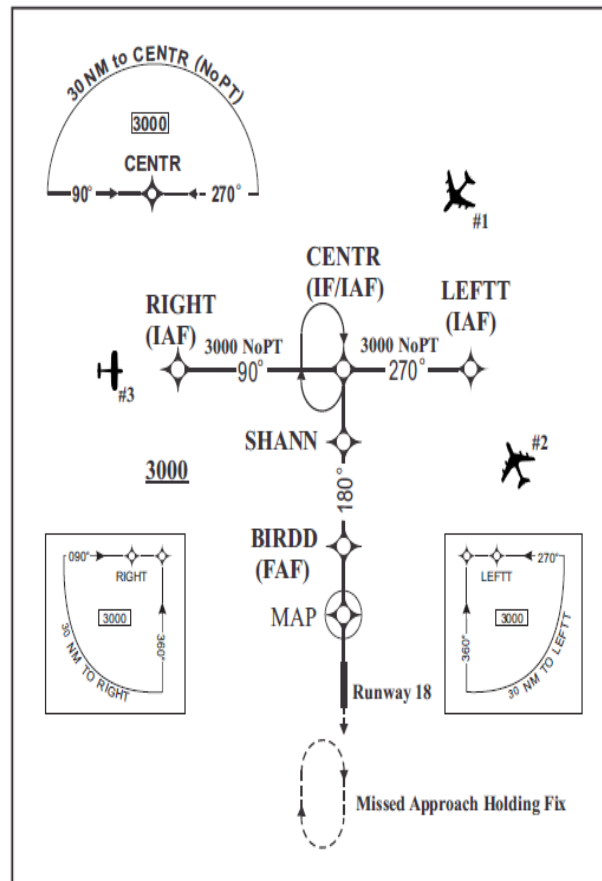
**EXAMPLE—**

**1. Aircraft 1:** The aircraft is in the straight in area of the TAA. “Seven miles from CENTR, Cleared R–NAV Runway One Eight Approach.”

**2. Aircraft 2:** The aircraft is in the left base area of the TAA. “One five miles from LEFTT, Cleared R–NAV Runway One Eight Approach.”

**3. Aircraft 3:** The aircraft is in the right base area of the TAA. “Four miles from RIGHT, Cleared R–NAV Runway One Eight Approach.”

**FIG 5–9–3**  
**Basic “T” Design**



## 5–9–5. APPROACH SEPARATION RESPONSIBILITY

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

**NOTE—**

The radar controller may be a controller in an ARTCC, a terminal facility, or a tower controller when authorized to perform the approach control function in a terminal area.

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.

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.

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

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 of paragraph 5-5-2, Target Separation, apply also.

**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.

## 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. Composite separation;

- d. 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 2-1-28, 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 2-1-28, RVSM Operations are applicable to this section.

**REFERENCE–**

*FAA Order JO 7110.65, Para 2-1-28, RVSM Operations*

c. If the provisions of subpara a above cannot be accomplished, MTRs may be designated for MARSA operations. To preclude an inadvertent compromise of MARSA standards by ATC, appropriate MARSA application for such routes must be covered in a letter of agreement with the military scheduling activity. Establish separation between aircraft as soon as practicable after operation on the designated MARSA route is ended.

**NOTE–**

*For designated MARSA routes, the military assumes responsibility for separation for MTR aircraft that have passed the primary/alternate entry fix until separation is established by ATC after operations on the MARSA route are completed.*

d. The lateral airspace to be protected along an MTR is the designated width of the route.

e. Prior to an aircraft entering an MTR, request the pilot's estimate for the route's exit/alternate exit fix, the pilot's requested altitude after exiting and, if applicable, the number of reentries on a Strategic Training Range (STR).

**PHRASEOLOGY–**

*(Call sign) VERIFY YOUR EXIT FIX ESTIMATE AND REQUESTED ALTITUDE AFTER EXIT,*

*and if applicable,*

*THE NUMBER OF REENTRIES.*

f. Forward estimates for exit/alternate exit fixes, requested altitude after exit, and, if applicable, the number of reentries on the STR.

g. Apply the procedures of Paragraph 6–1–2, Nonreceipt of Position Report, based upon the pilot's estimate for the route exit fix.

h. Clearance may be issued to amend or restrict operations on a route for ATC considerations. Where a route has been designated MARSA in accordance with subpara c, ATC must not amend or restrict operations in such a manner as to compromise MARSA provisions.

**NOTE–**

*When MARSA is provided through route scheduling and circumstances prevent the pilot from entering the route within established time limits, it must be the responsibility of the pilot to inform the ATC facility and advise his/her intentions.*

i. If an aircraft on an IR experiences a two-way radio communications failure and you are unable to determine if the aircraft is proceeding VFR in accordance with 14 CFR Section 91.185(b) or the aircraft has not been positively radar identified:

1. Provide separation to the destination airport based on the aircraft complying with the following:

(a) Maintain to the exit/alternate exit fix the higher of the following altitudes:

(1) The minimum IFR altitude for each of the remaining route segment(s) remaining on the route.

(2) The highest altitude assigned in the last ATC clearance.

(b) Depart the exit/alternate exit fix at the appropriate altitude specified in subpara (a) above, then climb/descend to the altitude filed in the flight plan for the remainder of the flight, or

**NOTE–**

*In the event of a two-way communications failure, ATC will be based on the following anticipated pilot action at the exit fix. Unless otherwise covered in a letter of agreement, and if the pilot is unable to comply with the VFR provisions of 14 CFR Section 91.185/FLIP IFR Supplement, the pilot will exercise his/her emergency authority, squawk transponder **Code 7700**, depart the exit/alternate exit fix and climb/descend (continuing to squawk 7700) to the altitude filed in the flight plan. Subsequent transponder operations will be in accordance with Paragraph 10–4–4, Communications Failure. Air traffic controller action from the exit fix is as prescribed in Paragraph 10–1–1, Emergency Determinations.*

(c) Proceed in accordance with the lost communication procedure contained in letters of agreement.

2. Continue to monitor the last ATC assigned discrete code.

**NOTE–**

*Pilots who experience a two-way radio failure will adjust their transponder to **Code 7700** during climb/descent to altitude filed for the next leg of the flight plan; then change to **Code 7600** for a period of 15 minutes. At the end of each 15-minute period, he/she will squawk 7700 for a period of 1 minute; all other times he/she will squawk 7600.*

j. Impose delays, if needed, to eliminate conflict with nonparticipating IFR aircraft when necessary to preclude denial of IR usage. Advise the pilot of the expected length and reason for delay.

## 9-2-8. INTERCEPTOR OPERATIONS

Provide maximum assistance to expedite the movement of interceptor aircraft on active air defense (scrambles) missions until the unknown aircraft is identified in accordance with the policies and procedures published in FAA Order JO 7610.4, Special Operations.

### NOTE-

*The FAA and the military have mutually agreed to the implementation of policies and procedures for control of air defense interceptor operations. Effective coordination and cooperation between FAA and the military at all levels are essential if policy objectives are to be met.*

a. The ADCF initiating the SCRAMBLE must identify the mission as an active air defense mission.

b. ATC services must be used for active air defense missions insofar as the circumstances and situation permits.

c. Upon request, the ATC facility must expedite transfer of the control jurisdiction of the interceptors to the requesting ADCF.

## 9-2-9. SPECIAL INTEREST SITES

a. Immediately relay any reports or information regarding unusual aircraft activities in the vicinity of special interest sites such as nuclear power plants, power plants, dams, refineries, etc., to supervisory/CIC personnel.

### NOTE-

*Air traffic controllers have no responsibilities to monitor or observe aircraft in the vicinity of special interest sites unless directed by supervisory/CIC personnel.*

## 9-2-10. SPECIAL AIR TRAFFIC RULES (SATR) AND SPECIAL FLIGHT RULES AREA (SFRA)

The Code of Federal Regulations prescribes special air traffic rules for aircraft operating within the boundaries of certain designated airspace. These areas are listed in 14 CFR Part 93 and can be found throughout the NAS. Procedures, nature of operations, configuration, size, and density of traffic vary among the identified areas.

a. Special Flight Rules Areas are areas of airspace wherein the flight of aircraft is subject to special air traffic rules set forth in 14 CFR Part 93, unless otherwise authorized by air traffic control. Not all

areas listed in 14 CFR Part 93 are Special Flight Rules Areas, but special air traffic rules apply to all areas designated as SFRA.

### REFERENCE-

*14 CFR Part 93, Special Air Traffic Rules.*

*P/CG, SPECIAL AIR TRAFFIC RULES (SATR)*

*P/CG, SPECIAL FLIGHT RULES AREA (SFRA)*

b. Each person operating an aircraft to, from, or within airspace designated as a SATR area or SFRA must adhere to the special air traffic rules set forth in 14 CFR Part 93, as applicable, unless otherwise authorized or required by ATC.

## 9-2-11. ATC SECURITY SERVICES FOR THE WASHINGTON, DC, SPECIAL FLIGHT RULES AREA (DC SFRA)

Provide ATC security services at locations where procedures are required for tracking aircraft in security services airspace. ATC security services are designed to support the national security mission of the FAA and other agencies. Two-way radio communications, flight planning, and an operational transponder on an assigned code are required for operations in the designated area.

a. When the assigned code is observed, advise the aircraft to proceed on course/as requested but to remain outside of Class B, C, and/or D airspace as appropriate.

### PHRASEOLOGY-

*(ACID) TRANSPONDER OBSERVED PROCEED ON COURSE/AS REQUESTED; REMAIN OUTSIDE (class) AIRSPACE.*

1. Maintain continuous security tracking of VFR aircraft operating in the designated area to assist security forces in situational awareness. Immediately report all instances of loss of radio communication or the inability to conduct security tracking of an aircraft to the operations supervisor (OS)/CIC and wait for instructions.

2. Basic separation services to aircraft, for example, IFR, SVFR, Class B, Class C, TRSA, do not apply to ATC security tracking.

3. Aircraft with operating transponders, but without operating Mode C (altitude), require specific authorization from ATC to operate in the SFRA. ATC must coordinate with the Domestic Events Network (DEN) before approval.

4. Aircraft flying too low for radar coverage must be instructed to report landing or exiting the

SFRA. Keep flight progress strips on these aircraft until pilot reports landing or exiting the SFRA. If a flight progress strip does not exist for the aircraft, record the call sign, transponder code, entry point (for example, north, northeast, east), and time of entry into the SFRA.

**PHRASEOLOGY–**

(Call sign), *REPORT LANDING OR LEAVING THE SFRA.*

5. United States military, law enforcement, and aeromedical flights are exempt from filing flight plans.

**b. Establishing two-way Communications.**

1. Pilots must establish two-way radio communications with ATC prior to entering the security service area. Responding to a radio call with, “(a/c call sign) standby,” establishes radio communications and the pilot may enter the area, provided all other security requirements have been satisfied.

2. Aircraft requesting security services should not normally be held. However, if holding is necessary or workload/traffic conditions prevent immediate provision of ATC security services, inform the pilot to remain outside the designated area until conditions permit the provision of ATC security services. Inform the pilot of the expected length of delay.

**PHRASEOLOGY–**

(A/C call sign) *REMAIN OUTSIDE OF THE (location) AND STANDBY. EXPECT (time) MINUTES DELAY.*

**c. Termination of Service.**

1. If the aircraft is not landing within the designated area, provide security services until the aircraft exits the area and then advise the aircraft to squawk VFR and that frequency change is approved.

**PHRASEOLOGY–**

*SQUAWK VFR, FREQUENCY CHANGE APPROVED.*

or

*CONTACT (facility identification).*

2. When an aircraft is landing at an airport inside the area, instruct the pilot to remain on the assigned transponder code until after landing.

**PHRASEOLOGY–**

(ACID) *REMAIN ON YOUR ASSIGNED TRANSPONDER*

*CODE UNTIL YOU LAND, FREQUENCY CHANGE APPROVED.*

3. Using approved handoff functionality, transfer the data blocks of all security tracked aircraft that will enter another sector/position for coordination of aircraft information/location. Upon acceptance of the transferred information, instruct the pilot to contact the next sector/positions’ frequency.

## 9-2-12. SECURITY NOTICE (SECNOT)

Upon receiving notification of a SECNOT, the controller must forward all information on the subject aircraft to the OS/CIC. If information is not known, broadcast call sign on all frequencies and advise the OS/CIC of the response.

**REFERENCE–**

*P/CG Term – Security Notice.*

*FAA Order JO 7210.3, Chapter 19, Section 9, Security Notice (SECNOT).*

## 9-2-13. LAW ENFORCEMENT OPERATIONS BY CIVIL AND MILITARY ORGANIZATIONS

**a. Law enforcement alerts.**

1. Aircraft lookouts must not be distributed outside the FAA.

**REFERENCE–**

*FAA Order 1600.29, Law Enforcement Alert Message System.*

*FAA Order JO 7210.3, Para 2-7-7, Cooperation With Law Enforcement Agencies.*

2. Stolen aircraft alerts, including stolen aircraft summaries, may be distributed outside the FAA to: airport offices, air carriers, fixed base operators, and law enforcement agencies.

3. Upon receipt of knowledge concerning an aircraft for which a current law enforcement alert message is held, do the following:

(a) Forward any information on the aircraft to El Paso Intelligence Center (EPIC) and the requester when specified in the message.

(b) Immediately notify the cognizant Transportation Security Administration office by the most rapid means.

(c) **DO NOT TAKE ANY OTHER ACTION AFFECTING THE AIRCRAFT, CARGO, CREW, OR PASSENGERS NOT NORMALLY RELATED TO JOB RESPONSIBILITIES.**

**b. Special law enforcement operations.**

1. Special law enforcement operations include inflight identification, surveillance, interdiction and pursuit activities performed in accordance with official civil and/or military mission responsibilities.

2. To facilitate accomplishment of these special missions, exemptions from specified parts of Title 14 of the Code of Federal Regulations have been granted to designated departments and agencies. However, it is each organization's responsibility to apprise ATC of their intent to operate under an authorized exemption before initiating actual operations.

**REFERENCE–**

FAA Order JO 7210.3, Para 18–3–1, Authorizations and Exemptions from Title 14, Code of Federal Regulations (14 CFR).

3. Additionally, some departments and agencies that perform special missions have been assigned coded identifiers to permit them to apprise ATC of ongoing mission activities and solicit special air traffic assistance.

**REFERENCE–**

FAA Order 7110.67, Special Aircraft Operations by Law Enforcement/Military Organizations.

**NOTE–**

As specified in Para 2–1–4, Operational Priority, priority of handling for aircraft operating with coded identifiers will be the same as that afforded to SAR aircraft performing a SAR mission.

c. Assistance to law enforcement aircraft operations.

1. Provide the maximum assistance possible to law enforcement aircraft, when requested, in helping them locate suspect aircraft.

2. Communicate with law enforcement aircraft, when possible and if requested, on a frequency not paired with your normal communications frequencies.

3. Do not allow assistance to law enforcement aircraft to violate any required separation minima.

4. Do not assist VFR law enforcement aircraft in any way that will create a situation which, in your judgment, places the aircraft in unsafe proximity to terrain or other aircraft.

## 9–2–14. MILITARY AERIAL REFUELING

Authorize aircraft to conduct aerial refueling along published or special tracks at their flight plan altitude, unless otherwise requested.

**PHRASEOLOGY–**

*CLEARED TO CONDUCT REFUELING ALONG (number) TRACK,*

*or*

*FROM (fix) TO (fix),*

*and*

*MAINTAIN REFUELING LEVEL (altitude),*

*or*

*MAINTAIN (altitude),*

*or*

*COMMENCING AT (altitude), DESCENDING TO (altitude).*

**NOTE–**

1. During aerial refueling, tanker aircraft are responsible for receiver aircraft communication with ATC and for their navigation along the track.

2. Aerial refueling airspace is not sterilized airspace and other aircraft may transit this airspace provided vertical or lateral separation is provided from refueling aircraft.

3. MARSAs begin between the tanker and receiver when the tanker and receiver(s) have entered the air refueling airspace and the tanker advises ATC that he/she is accepting MARSAs.

4. MARSAs end between the tanker and receiver when the tanker advises ATC that the tanker and receiver aircraft are vertically positioned within the air refueling airspace and ATC advises MARSAs are terminated.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–11, Use of MARSAs.

FAA Order JO 7110.65, Para 5–5–8, Additional Separation for Formation Flights.

FAA Order JO 7610.4, Chapter 10, Aerial Refueling.

a. Provide radar assistance to the rendezvous for participating aircraft:

1. When requested, and

2. By providing vertical separation prior to MARSAs declaration.

b. Do not request receiver aircraft that have been cleared to conduct air refueling and have departed the ARIP to:

1. Make code changes when less than 5 miles from the tanker.

2. Squawk standby when less than 1 mile or more than 3 miles from the tanker.



### 9-2-17. AVOIDANCE OF AREAS OF NUCLEAR RADIATION

a. Advise pilots whenever their proposed flight path will traverse a reported or forecasted area of hazardous radiation and reroute the aircraft when requested by the pilot.

**REFERENCE-**

FAA Order JO 7610.4, Para 4-4-4, Avoidance of Hazardous Radiation Areas.

b. Inform pilots when an airfield of intended landing lies within a reported or forecasted area of hazardous radiation and request the pilot to advise his/her intentions.

### 9-2-18. SAMP

Provide special handling to U.S. Government and military aircraft engaged in aerial sampling missions (atmosphere sampling for nuclear, chemical, or hazardous material contamination). Honor inflight clearance requests for altitude and route changes to the maximum extent possible. Other IFR aircraft may be recleared so that requests by SAMPLER aircraft are honored. Separation standards as outlined in this order must be applied in all cases.

**REFERENCE-**

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

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

FAA Order JO 7610.4, Para 4-4-4, Avoidance of Hazardous Radiation Areas.

### 9-2-19. AWACS/NORAD SPECIAL FLIGHTS

Do not delay E-3 AWACS aircraft identified as "AWACS/NORAD Special" flights. The following control actions are acceptable while expediting these aircraft to the destination orbit.

a. En route altitude changes  $\pm$  2,000 feet from the requested flight level.

b. Radar vectors or minor route changes that do not impede progress towards the destination orbit.

**NOTE-**

NORAD has a requirement to position E-3 AWACS aircraft at selected locations on a time-critical basis. To the extent possible these flights will utilize routes to the destination orbit that have been precoordinated with the impacted ATC facilities. To identify these flights, the words "AWACS/NORAD SPECIAL" will be included as the first item in the remarks section of the flight plan.

### 9-2-20. WEATHER RECONNAISSANCE FLIGHTS

TEAL and NOAA mission aircraft fly reconnaissance flights to gather meteorological data on winter storms, (NWSOP missions), hurricanes and tropical cyclones (NHOP missions). The routes and timing of these flights are determined by movement of the storm areas and not by traffic flows.

a. When a dropsonde release time is received from a TEAL or NOAA mission aircraft, workload and priorities permitting, controllers must advise the mission aircraft of any traffic estimated to pass through the area of the drop at altitudes below that of the mission aircraft. This traffic advisory must include:

1. Altitude.

2. Direction of flight.

3. ETA at the point closest to drop area (or at the fix/intersection where drop will occur).

**NOTE-**

A dropsonde is a 14-inch long cardboard cylinder about 2.75 inches in diameter, that weighs approximately 14 ounces (400 grams), and has a parachute attached. When released from the aircraft it will fall at a rate of approximately 2,500 feet per minute. Controllers should recognize that a dropsonde released at FL 310 will be a factor for traffic at FL 210 four minutes later. It is the aircraft commanders responsibility to delay release of dropsondes if traffic is a factor. Aircraft commanders will delay release of dropsondes based solely upon traffic as issued by ATC.

b. When advised that an airborne TEAL or NOAA aircraft is requesting a clearance via CARCAH, issue the clearance in accordance with Chapter 4, IFR, Section 2, Clearances.

**REFERENCE-**

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

FAA Order JO 7110.65, Para 4-2-2, Clearance Prefix.

FAA Order JO 7110.65, Para 4-2-3, Delivery Instructions.

c. If a TEAL or NOAA mission aircraft must be contacted but is out of VHF, UHF, and HF radio range, advise the supervisory traffic management coordinator-in-charge.

**REFERENCE-**

FAA Order JO 7210.3, Para 5-3-6, Weather Reconnaissance Flights.

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

d. Aircraft operations associated with a Weather Reconnaissance Area (WRA) must be conducted in accordance with the Memorandum of Agreement between the National Oceanic and Atmospheric

Administration Aircraft Operations Center, U.S. Air Force Reserve Command 53<sup>rd</sup> Weather Reconnaissance Squadron, and the Federal Aviation Administration Air Traffic Organization in Support of the National Hurricane Operations Plan (FAA Order JO 7610.4, Appendix 3), and the associated letters of agreement.

### 9-2-21. EVASIVE ACTION MANEUVER

Approve a pilot request to conduct an evasive action maneuver only on the basis of a permissible traffic situation. Specify the following items, as necessary, when issuing approval:

**NOTE-**

*The “evasive action” maneuver is performed by a bomber/fighter bomber aircraft at or above FL 250 along a 60 NM long segment of the flight plan route overlying a RBS or other site and includes:*

1. *Flying a zigzag pattern on both the left and right side of the flight plan route centerline. Altitude deviations are made in conjunction with the lateral maneuvering.*
2. *Lateral deviations from the route centerline will not normally exceed 12 miles. Altitude variations must not exceed plus or minus 1,000 feet of the assigned flight level; i.e., confined within a 2,000 foot block.*

a. Specific route segment on which the maneuver will take place.

b. Distance of maximum route deviation from the centerline in miles.

c. Altitude.

**PHRASEOLOGY-**

**CLEARED TO CONDUCT EVASIVE ACTION MANEUVER FROM (fix) TO (fix),**

*and*

*(number of miles) EITHER SIDE OF CENTERLINE,*

*and*

**MAINTAIN (altitude) THROUGH (altitude),**

*and*

**COMPLETE MANEUVER AT (fix) AT (altitude).**

### 9-2-22. NONSTANDARD FORMATION/CELL OPERATIONS

Occasionally the military is required to operate in a nonstandard cell formation and controllers should be

knowledgeable of the various tactics employed and the procedures used.

**REFERENCE-**

*FAA Order JO 7610.4, Chapter 12, Section 11, Formation Flight.*

a. Formation leaders are responsible for obtaining ATC approval to conduct nonstandard formation/cell operations.

b. When nonstandard formation/cell operations have been approved, controllers must assign sufficient altitudes to allow intra-cell vertical spacing of 500 feet between each aircraft in the formation.

c. Control nonstandard formation/cell operations on the basis that MARSA is applicable between the participating aircraft until they establish approved separation which is acknowledged by ATC.

d. Apply approved separation criteria between the approved nonstandard formation/cell envelope and nonparticipating aircraft.

e. Clear aircraft operating in a nonstandard formation/cell to the breakup fix as the clearance limit. Forward data pertaining to route or altitude beyond the breakup point to the center concerned as a part of the routine flight plan information.

f. **EN ROUTE.** If the breakup occurs in your area, issue appropriate clearances to authorize transition from formation to individual routes or altitudes. If a breakup cannot be approved, issue an appropriate clearance for the flight to continue as a formation.

### 9-2-23. OPEN SKIES TREATY AIRCRAFT

a. Open Skies aircraft will be identified by the call sign “OSY” (Open Skies) followed by the flight number and a one-letter mission suffix.

**EXAMPLE-**

**OSY123D**

*Mission suffixes:*

*\*F = Observation Flights (Priority).*

*\*D = Demonstration Flights (Priority).*

*\*T = Transit Flights (Nonpriority).*

**NOTE-**

1. *Observation/Demonstration flights are conducted under rigid guidelines outlined in the Treaty on Open Skies that govern sensor usage, maximum flight distances, altitudes and priorities.*

2. *Transit flights are for the sole purpose of moving an Open Skies aircraft from airport to airport in preparation for an actual Open Skies “F” or “D” mission.*

b. Provide priority and special handling to expedite the movement of an Open Skies observation or demonstration flight.

**REFERENCE-**

FAA Order JO 7110.65, Para 2-1-4, Operational Priority, subpara 1.  
 FAA Order JO 7210.3, Para 5-3-7, Open Skies Treaty Aircraft.  
 Treaty on Open Skies, Treaty Document, 102-37.

**c.** Open Skies (F and D) Treaty aircraft, while maintaining compliance with ATC procedures, must have priority over activities in special use airspace (SUA)/Air Traffic Control Assigned Airspace (ATCAA). Open Skies (F and D) Treaty aircraft are nonparticipating aircraft and must be allowed to transit SUA/ATCAA as filed after appropriate and timely coordination has been accomplished between the using agency and controlling agency.

**NOTE-**

*A letter of agreement is not required for nonparticipating aircraft to transit deactivated/released airspace.*

**REFERENCE-**

FAA Order JO 7110.65, Para 9-3-4, Transiting Active SUA/ATCAA

**1.** Open Skies (F and D) Treaty flights transiting SUA/ATCAA will be handled in the following manner:

**(a)** The ATC facility controlling the Open Skies (F and D) Treaty flight must advise the using agency, or appropriate ATC facility, upon initial notification and when the aircraft is 30 minutes from the SUA/ATCAA boundary; and

**(1)** For active SUA/ATCAA with an ATC facility, coordinate and execute the transit of Open Skies (F and D) Treaty aircraft.

**REFERENCE-**

FAA Order JO 7110.65, Para 9-3-4, Transiting Active SUA/ATCAA

**(2)** For active SUA/ATCAA without an ATC facility, the using agency must deactivate/release the SUA/ATCAA to permit the Open Skies (F

and D) Treaty aircraft to transit as filed in proximity to the active SUA/ATCAA. When deactivating/releasing the SUA/ATCAA for this purpose, the using agency is only required to deactivate/release the portion of the SUA/ATCAA to the controlling agency that is necessary to provide approved separation.

**(b)** The using agency must deactivate/release the SUA/ATCAA, or portion thereof, no later than 15 minutes prior to the Open Skies (F and D) Treaty aircraft reaching the SUA/ATCAA boundary.

**(c)** If the controlling agency is unable to confirm with the using agency that all conflicting activities in the SUA/ATCAA have ceased, the Open Skies aircraft must not be permitted access to the SUA/ATCAA.

**REFERENCE-**

FAA Order JO 7110.65, Para 9-3-2, Separation Minima

**2.** Return SUA/ATCAA to the using agency, if requested, within (15) minutes after the Open Skies (F and D) Treaty aircraft clears the SUA/ATCAA.

**d.** Clear the aircraft according to the filed flight plan.

**1.** Do not ask the pilot to deviate from the planned action or route of flight except to preclude an emergency situation or other higher priority aircraft.

**2.** Do not impose air traffic control delays except to preclude emergency situations or other higher priority aircraft.

**NOTE-**

*If for reasons of flight safety the route or altitude must be changed, return the aircraft to the filed flight plan route as soon as practical.*



remain clear of the suspect aircraft by at least 100 yards if able.

**NOTE–**

*Passenger deplaning may be of paramount importance and must be considered before the aircraft is parked or moved away from service areas. The decision to use ramp facilities rests with the pilot, aircraft operator/airport manager.*

c. If you are unable to inform the suspect aircraft of a bomb threat or if you lose contact with the aircraft, advise your supervisor and relay pertinent details to other sectors or facilities as deemed necessary.

d. When a pilot reports the discovery of a bomb or suspected bomb on an aircraft which is airborne or on the ground, determine the pilot's intentions and comply with his/her requests in so far as possible. Take all of the actions discussed in the preceding paragraphs which may be appropriate under the existing circumstances.

e. The handling of aircraft when a hijacker has or is suspected of having a bomb requires special considerations. Be responsive to the pilot's requests and notify supervisory personnel. Apply hijacking procedures and offer assistance to the pilot according to the preceding paragraphs, if needed.

## 10-2-12. EXPLOSIVE DETECTION K-9 TEAMS

Take the following actions should you receive an aircraft request for the location of the nearest explosive detection K-9 team.

**REFERENCE–**

*FAA Order JO 7210.3, Para 2-1-11, Explosives Detection K-9 Teams.*

a. Obtain the aircraft identification and position and advise your supervisor of the pilot request.

b. When you receive the nearest location of the explosive detection K-9 team, relay the information to the pilot.

c. If the aircraft wishes to divert to the airport location provided, obtain an estimated arrival time from the pilot and advise your supervisor.

## 10-2-13. MANPADS ALERT

When a threat or attack from Man-Portable Air Defense Systems (MANPADS) is determined to be real, notify and advise aircraft as follows:

a. Do not withhold landing clearance. To the extent possible, issue information on MANPADS threats, confirmed attacks, or post-event activities in time for it to be useful to the pilot. The pilot or parent company will determine the pilot's actions.

b. MANPADS information will be disseminated via the ATIS and/or controller-to-pilot transmissions.

c. Disseminate via controller-to-pilot transmission until the appropriate MANPADS information is broadcast via the ATIS and pilots indicate they have received the appropriate ATIS code. MANPADS information will include nature and location of threat or incident, whether reported or observed and by whom, time (if known), and when transmitting to an individual aircraft, a request for pilot's intentions.

**PHRASEOLOGY–**

*ATTENTION (aircraft identification), MANPADS ALERT. EXERCISE EXTREME CAUTION. MANPADS THREAT/ ATTACK/POST-EVENT ACTIVITY OBSERVED/ REPORTED BY (reporting agency) (location) AT (time, if known). (When transmitting to an individual aircraft) SAY INTENTIONS.*

**EXAMPLE–**

*“Attention Eastern Four Seventeen, MANPADS alert. Exercise extreme caution. MANPADS threat reported by TSA, LaGuardia vicinity. Say intentions.”*

*“Attention all aircraft, MANPADS alert. Exercise extreme caution. MANPADS post-event activity observed by tower south of airport at two-one-zero-zero Zulu.”*

d. Report MANPADS threat/attack/post-event activity via the ATIS and/or controller-to-pilot transmissions until notified otherwise by the Domestic Events Network (DEN) Air Traffic Security Coordinator (ATSC).

**REFERENCE–**

*FAA Order JO 7110.65, Para 2-9-3, Content.*

*FAA Order JO 7210.3, Para 2-1-9, Handling MANPADS Incidents.*

*FAA Order JO 7610.4, Para 16-1-3, Responsibilities.*

## 10-2-14. UNAUTHORIZED LASER ILLUMINATION OF AIRCRAFT

a. When a laser event is reported to an air traffic facility, broadcast on all appropriate frequencies a general caution warning every five minutes for 20 minutes following the last report.

**PHRASEOLOGY–**

*UNAUTHORIZED LASER ILLUMINATION EVENT, (location), (altitude).*

b. Terminal facilities must include reported unauthorized laser illumination events on the ATIS

broadcast for one hour following the last report. Include the time, location, altitude, color, and direction of the laser as reported by the pilot.

**NOTE—**

*All personnel can expect aircrews to regard lasers as an inflight emergency and may take evasive action to avoid laser illumination. Additionally, other aircraft may request clearance to avoid the area.*

**REFERENCE—**

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

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

## 10–2–15. EMERGENCY AIRPORT RECOMMENDATION

a. Consider the following factors when recommending an emergency airport:

1. Remaining fuel in relation to airport distances.
2. Weather conditions.

**NOTE—**

*Depending on the nature of the emergency, certain weather phenomena may deserve weighted consideration when recommending an airport; e.g., a pilot may elect to fly farther to land at an airport with VFR instead of IFR conditions.*

3. Airport conditions.
4. NAVAID status.
5. Aircraft type.
6. Pilot's qualifications.
7. Vectoring or homing capability to the emergency airport.

b. Consideration to the provisions of subpara a and Paragraph 10–2–16, Guidance to Emergency Airport, must be used in conjunction with the information derived from any automated emergency airport information source.

## 10–2–16. GUIDANCE TO EMERGENCY AIRPORT

a. When necessary, use any of the following for guidance to the airport:

1. Radar.
2. Following another aircraft.
3. NAVAIDs.

4. Pilotage by landmarks.

5. Compass headings.

b. Consideration to the provisions of Para 10–2–15, Emergency Airport Recommendation, must be used in conjunction with the information derived from any automated emergency airport information source.

## 10–2–17. EMERGENCY OBSTRUCTION VIDEO MAP (EOVM)

a. The EOVM is intended to facilitate advisory service to an aircraft in an emergency situation wherein an appropriate terrain/obstacle clearance minimum altitude cannot be maintained. It must only be used and the service provided under the following conditions:

1. The pilot has declared an emergency, or
2. The controller has determined that an emergency condition exists or is imminent because of the pilot's inability to maintain an appropriate terrain/obstacle clearance minimum altitude.

**NOTE—**

*Appropriate terrain/obstacle clearance minimum altitudes may be defined as Minimum IFR Altitude (MIA), Minimum En Route Altitude (MEA), Minimum Obstruction Clearance Altitude (MOCA), or Minimum Vectoring Altitude (MVA).*

b. When providing emergency vectoring service, the controller must advise the pilot that any headings issued are emergency advisories intended only to direct the aircraft toward and over an area of lower terrain/obstacle elevation.

**NOTE—**

*Altitudes and obstructions depicted on the EOVM are the actual altitudes and locations of the obstacle/terrain and contain no lateral or vertical buffers for obstruction clearance.*

**REFERENCE—**

FAA Order JO 7210.3, Para 3–9–4, Emergency Obstruction Video Map (EOVM).

## 10–2–18. VOLCANIC ASH

a. If a volcanic ash cloud is known or forecast to be present:

1. Relay all information available to pilots to ensure that they are aware of the ash cloud's position and altitude(s).
2. Suggest appropriate reroutes to avoid the area of known or forecast ash clouds.

**NOTE–**

*Volcanic ash clouds are not normally detected by airborne or air traffic radar systems.*

**b.** If advised by an aircraft that it has entered a volcanic ash cloud and indicates that a distress situation exists:

**1.** Consider the aircraft to be in an emergency situation.

**2.** Do not initiate any climb clearances to turbine-powered aircraft until the aircraft has exited the ash cloud.

**3.** Do not attempt to provide escape vectors without pilot concurrence.

**NOTE–**

**1.** *The recommended escape maneuver is to reverse course and begin a descent (if terrain permits). However, it is the pilot's responsibility to determine the safest escape route from the ash cloud.*

**2.** *Controllers should be aware of the possibility of complete loss of power to any turbine-powered aircraft that encounters an ash cloud.*

**REFERENCE–**

FAA Order JO 7110.65, Para 10–2–4, Altitude Change for Improved Reception.

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

## **10–2–19. REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT**

**a.** If an air traffic controller receives a report of the death of person, an illness, and/or other public health risk obtain the following information and notify the operations manager in charge (OMIC)/operations supervisor (OS)/controller-in-charge (CIC) as soon as possible.

- 1.** Call sign.
- 2.** Number of suspected cases of illness on board.
- 3.** Nature of the illnesses or other public health risk, if known.
- 4.** Number of persons on board.
- 5.** Number of deaths, if applicable.
- 6.** Pilot's intent (for example, continue to destination or divert).
- 7.** Any request for assistance (for example, needing emergency medical services to meet the aircraft at arrival).

**b.** The OMIC/OS/CIC must relay the information to the DEN as soon as possible.

**NOTE–**

**1.** *If the ATC facility is not actively monitoring the DEN or does not have a dedicated line to the DEN, they must call into the DEN directly via (202) 267–4700 or (844) 432–2962 (toll free). Either phone number may be used to contact the DEN. Additionally, if these phone numbers are out of service, alternate back-up bridge phone numbers should be used to contact the DEN: (405) 225–2444 or (844) 663–9723 (toll free).*

**2.** *Except in extraordinary circumstances, such as a situation requiring ATC intervention, follow-on coordination regarding the incident will not involve ATC frequencies.*

**3.** *The initial report to a U.S. ATC facility may be passed from a prior ATC facility along the route of flight.*

**REFERENCE–**

FAA Order JO 7210.3, Para 2-1-30, Reporting Death, Illness, or Other Public Health Risk On Board Aircraft





# Chapter 11. Traffic Management Procedures

## Section 1. General

### 11-1-1. DUTY RESPONSIBILITY

a. The mission of the traffic management system is to balance air traffic demand with system capacity to ensure the maximum efficient utilization of the NAS.

b. TBFM must be used to the maximum extent feasible in preference to miles-in-trail initiatives.

**NOTE—**

*The benefits of TBFM are best realized through the coordinated effort of all facilities supporting Performance Based Navigation procedures or Traffic Management Initiatives (TMIs).*

c. It is recognized that the ATCS is integral in the execution of the traffic management mission.

**NOTE—**

*Complete details of traffic management initiatives and programs can be found in FAA Order JO 7210.3, Facility Operation and Administration.*

### 11-1-2. DUTIES AND RESPONSIBILITIES

a. Supervisory Traffic Management Coordinator-in-Charge (STMCIC) must:

1. Ensure an operational briefing is conducted at least once during the day and evening shifts. Participants must include, at a minimum, the STMCIC, Operations Supervisor-in-Charge (OSMIC)/Controller-in-Charge (CIC) and other interested personnel as designated by facility management. Discussions at the meeting should include meteorological conditions (present and forecasted), staffing, equipment status, runways in use, Airport Arrival Rate (AAR)/Metering Parameters and Traffic Management Initiatives (TMIs) (present and anticipated).

2. Assume responsibility for TMC duties when not staffed.

3. Ensure that TMIs are carried out by personnel providing traffic management services.

4. Where authorized, perform EDST data entries to keep the activation status of designated EDST Airspace Configuration Elements current.

5. Perform assigned actions in the event of an EDST outage or degradation, in accordance with the requirements of FAA Order JO 7210.3, Facility Operation and Administration, and as designated by facility directive.

6. Ensure changes to restrictions/metering are implemented in a timely manner.

**b. OS/CIC must:**

1. Keep the TMU and affected sectors apprised of situations or circumstances that may cause congestion or delays.

2. Coordinate with the TMU and personnel providing air traffic services to develop appropriate TMIs for sectors and airports in their area of responsibility.

3. Continuously review TMIs affecting their area of responsibility and coordinate with TMU for extensions, revisions, or cancellations.

4. Ensure that TMIs are carried out by personnel providing air traffic services.

5. Where authorized, perform data entries to keep the activation status of designated EDST Airspace Configuration Elements current.

6. Perform assigned actions in the event of an EDST outage or degradation, in accordance with the requirements of FAA Order JO 7210.3, Facility Operation and Administration, and as designated by facility directive.

7. Ensure changes to TMIs are implemented in a timely manner.

**c. Personnel providing air traffic services must:**

1. Ensure that TMIs are enforced within their area of responsibility. TMIs do not have priority over maintaining:

(a) Separation of aircraft.

(b) Procedural integrity of the sector.

2. Keep the OS/CIC and TMU apprised of situations or circumstances that may cause congestion or delays.

3. Continuously review TMIs affecting their area of responsibility and coordinate with OS/CIC and TMU for extensions, revisions, or cancellations.

4. Where authorized, perform data entries to keep the activation status of designated EDST Airspace Configuration Elements current.

5. Perform assigned actions in the event of an EDST outage or degradation, in accordance with the requirements of FAA Order JO 7210.3, Facility Operation and Administration, and as designated by facility directive.

d. ARTCCs, unless otherwise coordinated, must:

1. Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to TMIs.

2. Monitor arrival flow for potential metering actions/changes and, if necessary, initiate coordination with all facilities to discuss the change to the metering plan.

e. TRACONS, unless otherwise coordinated, must:

1. Support TBFM operations and monitor TBFM equipment to improve situational awareness for a system approach to TMIs.

2. Monitor arrival flow for potential metering actions/changes and, if necessary, initiate coordination with all facilities to discuss the change to the metering plan.

3. Schedule internal departures in accordance with specific written procedures and agreements developed with overlying ARTCCs and adjacent facilities.

f. ATCTs, unless otherwise coordinated, must:

1. Monitor TBFM equipment to improve situational awareness for a system approach to TMIs.

2. Release aircraft, when CFR is in effect, so they are airborne within a window that extends from 2 minutes prior and ends 1 minute after the assigned time.

**NOTE–**

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

### **11–1–3. TIME BASED FLOW MANAGEMENT (TBFM)**

During periods of metering, personnel providing air traffic services must:

a. Display TBFM schedule information on the main display monitor (MDM).

b. Comply with TBFM-generated metering times within +/- 1 minute.

1. If TBFM-generated metering time accuracy within +/- 1 minute cannot be used for specific aircraft due to significant jumps in the delay countdown timer (DCT), other TMIs may be used between those aircraft such as miles-in-trail (MIT) or minutes-in-trail (MINIT) to assist in delay absorption until stability resumes.

2. An exception to the requirement to comply within +/- 1 minute may be authorized for certain ARTCC sectors if explicitly defined in an appropriate facility directive.

c. When compliance is not possible, coordinate with OS/CIC, personnel providing traffic management services, and adjacent facilities/sectors as appropriate.

**NOTE–**

*TBFM accuracy of generated metering times is predicated on several factors, including vectoring outside of TBFM route conformance boundaries (route recovery logic), certain trajectory ground speed calculations, and when TMU resequences a specific flight or flight list. Caution should be used in these situations to minimize impact on surrounding sector traffic and complexity levels, flight efficiencies, and user preferences.*

# Chapter 13. Decision Support Tools

## Section 1. ERAM Decision Support Tools (EDST)

### 13-1-1. DESCRIPTION

EDST is used by the sector team in performing its strategic planning responsibilities. EDST uses flight plan data, forecast winds, aircraft performance characteristics, and track data to derive expected aircraft trajectories, and to predict conflicts between aircraft and between aircraft and special use or designated airspace. It also provides trial planning and enhanced flight data management capabilities. Under ERAM, the EDST capabilities constitute the initial En Route decision support tools.

### 13-1-2. CONFLICT DETECTION AND RESOLUTION

a. Actively scan EDST information for predicted aircraft-to-aircraft and aircraft-to-airspace alerts.

b. When a conflict probe alert is displayed, evaluate the alert and take appropriate action as early as practical, in accordance with duty priorities.

c. Prioritize the evaluation and resolution of conflict probe alerts to ensure the safe, expeditious, and efficient flow of air traffic.

**NOTE–**

*Conflict probe alerts are based on standard radar separation. Conflict probe does not account for instances in which greater separation may be needed (e.g., non-standard formations, A380) or where reduced separation is permitted (e.g., 3mile airspace).*

d. When a conflict probe alert is displayed and when sector priorities permit, give consideration to the following in determining a solution:

1. Solutions that involve direct routing, altitude changes, removal of a flight direction constraint (i.e., inappropriate altitude for direction of flight), and/or removal of a static restriction for one or more pertinent aircraft.

2. Impact on surrounding sector traffic and complexity levels, flight efficiencies, and user preferences.

e. When the Stop Probe feature is activated for an aircraft, conflict probe for that aircraft shall be restarted before transfer of control, unless otherwise coordinated.

**NOTE–**

*The requirement in paragraph 13-1-2e does not apply to aircraft entering a non EDST facility.*

### 13-1-3. TRIAL PLANNING

When EDST is operational at the sector and when sector priorities permit, use the trial plan capability to evaluate:

a. Solutions to predicted conflicts.

b. The feasibility of granting user requests.

c. The feasibility of removing a flight direction constraint (i.e., inappropriate altitude for direction of flight) for an aircraft.

d. The feasibility of removing a static restriction for an aircraft.

### 13-1-4. CONFLICT PROBE-BASED CLEARANCES

When the results of a trial plan based upon a user request indicate the absence of alerts, every effort should be made to grant the user request, unless the change is likely to adversely affect operations at another sector.

### 13-1-5. THE AIRCRAFT LIST (ACL), DEPARTURE LIST (DL) AND FLIGHT DATA MANAGEMENT

a. The ACL must be used as the sector team's primary source of flight data.

b. Actively scan EDST to identify automated notifications that require sector team action.

c. When an ACL or DL entry has a Remarks indication, the Remarks field of the flight plan must be reviewed. Changes to the Remarks field must also be reviewed.

**d.** Highlighting an entry on the ACL or DL must be used to indicate the flight requires an action or special attention.

**e.** The Special Posting Area (SPA) should be used to group aircraft that have special significance (e.g., aircraft to be sequenced, air refueling missions, formations).

**f.** Sector teams shall post flight progress strips for any non-radar flights.

**g.** A flight progress strip shall be posted for any flight plan not contained in the EAS.

**h.** Sector teams shall post any flight progress strip(s) that are deemed necessary for safe or efficient operations. The sector team shall comply with all applicable facility directives to maintain posted flight progress strips.

**i.** The Drop Track Delete option shall be used in accordance with facility directives.

### 13-1-6. MANUAL COORDINATION AND THE COORDINATION MENU

**a.** Where automated coordination with a facility is not available (e.g., an international facility, a VFR tower), use the Coordination Menu or a flight

progress strip to annotate manual coordination status, in accordance with facility directives.

**b.** When the Coordination Menu is used and the flight plan is subsequently changed, remove the yellow coding from the Coordination Indicator after any appropriate action has been taken.

### 13-1-7. HOLDING

For flights in hold, use the ERAM Hold Data Menu/Hold View, the EDST Hold Annotations Menu, a flight progress strip, or a facility approved worksheet, to annotate holding instructions, in accordance with facility directives.

### 13-1-8. RECORDING OF CONTROL DATA

**a.** All control information not otherwise recorded via automation recordings or voice recordings must be manually recorded using approved methods.

**b.** When a verbal point out has been approved, remove the yellow color coding on the ACL.

**c.** When the ACL or DL Free Text Area is used to enter control information, authorized abbreviations must be used. You may use:

**1.** The clearance abbreviations authorized in TBL 13-1-1.

*TBL 13-1-1*  
**Clearance Abbreviations**

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

## **Appendix B. Standard Operating Practice (SOP) for Aircraft Deviating for Weather Near Active Special Activity Airspace (SAA)**

The procedures listed below must be applied and contained in a facility SOP when aircraft deviate into and/or near an active or scheduled SAA:

### **1. PURPOSE**

This appendix prescribes the method and step-by-step process for handling aircraft deviations for weather near active Special Activity Airspace (SAA). The procedures are intended to work in parallel to the preventive procedures outlined in FAA Order JO 7210.3, Facility Operation and Administration, Para 17-2-4a.9, which must be applied when weather is scheduled to impact an active or scheduled SAA.

### **2. DISCUSSION**

**a.** In all operational facilities, the increase in traffic density and the need for the expeditious movement of traffic without compromising safety have emphasized the importance of handling aircraft deviations for weather in the vicinity of active SAA.

**b.** The methods, and practices used for handling aircraft requesting or initiating deviations off of their filed route due to weather require time critical responses to the request or in response to observed course deviations. Major issues can occur whenever there is a heavy reliance upon reactive control actions when not performed according to this handbook and the procedures outlined in FAA Order JO 7210.3.

**c.** Course deviations in areas near active SAA's increase the workload for specialists at the time of their request or observation. The intent of this SOP is to make the handling of the requested deviation or to correct the observed course deviation take place smoothly and to ensure a safe operation with a minimum amount of workload.

### **3. TERMS**

The following terms are important for a complete understanding of this SOP:

**a.** Status Information Area (SIA). Manual or automatic displays of the current status of position related equipment and operational conditions or procedures.

**b.** Special Activity Airspace (SAA). Airspace of defined dimensions as an Alert Area, Controlled Firing Area, Military Operations Area (MOA), Prohibited Area, Restricted Area or Warning Area.

**c.** Deviations. A departure from a current clearance, such as an off course maneuvers to avoid weather or turbulence.

**d.** Using Agency. The using agency is the military unit or other organization whose activity established the requirement for the SAA. The using agency is responsible for ensuring that:

**1.** The airspace is used only for its designated purpose.

**2.** Proper scheduling procedures are established and utilized.

**3.** The controlling agency is kept informed of changes in scheduled activity, to include the completion of activities for the day.

**4.** A point of contact is made available to enable the controlling agency to verify schedules, and coordinate access for emergencies, weather diversions, etc.

**5.** An ATC facility may be designated as the using agency for joint-use areas when that facility has been granted priority for use of the airspace in a joint-use letter of procedure or letter of agreement.

### **4. PRECAUTIONS**

**a.** Unless clearance of nonparticipating aircraft in/through/adjacent to an active SAA is provided for in a Letter of Agreement or Letter of Procedure, any clearance issued to a nonparticipating aircraft must ensure separation from that SAA by the appropriate minima specified in paragraph 9-3-2.

**b.** The specialist receiving a request for a route deviation in the vicinity of an active SAA cannot issue a clearance into the active SAA airspace, unless the provisions of Paragraph 9-3-4 of this handbook are applied. The FAA has no jurisdictional authority over the use of non-joint use prohibited/restricted/warning area airspace; therefore, clearance cannot be issued for flight therein without appropriate approval.

**c.** If the specialist is able to coordinate approval for entry into the SAA from the using agency, a clearance to the aircraft complying with the provisions coordinated with the using agency can be issued; the specialist must notify the OS/CIC of this situation and of subsequent requests or deviations from other aircraft in the same area.

**d.** Use of Code 7700 for aircraft deviations into active SAA is not encouraged, particularly in situations involving multiple aircraft. Positive identification of aircraft may be lost if an aircraft deviates from flight plan track, particularly in the event of a momentary loss of radar or other interruption in tracking.

## **5. RESPONSIBILITY:**

If a deviation occurs that causes an aircraft to enter SAA the air traffic team must follow the procedures outlined below:

### **a. Attempt the following:**

**1.** Handoff the aircraft to the Using Agency and transfer communications; or

**2.** Point Out the aircraft to the Using Agency. The controller must:

**(a)** Continue to provide safety alerts and traffic advisories, as appropriate, to the affected aircraft.

**(b)** Continue to coordinate with the Using Agency until the situation is resolved.

**(c)** Assist the aircraft in exiting the SAA.

**3.** If the handoff or point out is unsuccessful, the controller must:

**(a)** If able, advise the Using Agency of the pilot's actions.

**(b)** Provide safety alerts and traffic advisories, as appropriate.

**(c)** Assist the aircraft in exiting the SAA as quickly as the weather allows.

**(d)** Continue to coordinate with the Using Agency until the situation is resolved.

**4.** If no approval to enter the SAA is given by the using agency:

**(a)** The specialist must advise the aircraft requesting the course deviation, or deviating toward the SAA, the status of the SAA, and that no clearance can be issued permitting entry into the airspace or;

**(b)** If an alternative course, which remains clear of the active SAA, is available, offer it to the pilot of the aircraft in question.

**5.** If the pilot of the nonparticipating aircraft exercises their discretion to deviate from that clearance which ensures separation from an active SAA, and the track of the aircraft will not maintain the required minima from an active SAA, controllers must ascertain if the pilot is exercising emergency authority:

**(a)** If so, provide assistance and obtain information as provided in Chapter 10, Emergencies.

**(b)** If not, provide appropriate pilot deviation notification as specified in Paragraph 2-1-26, Pilot Deviation Notification.

# 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:

CHOP  
FALLEN HERO  
LAND-BASED AIR DEFENSE IDENTIFICATION ZONE (ADIZ)  
MOUNTAIN WAVE  
TURBULENCE

e. Terms Modified:

AERONAUTICAL CHART  
AIR DEFENSE IDENTIFICATION ZONE (ADIZ)  
AIRMEN'S METEOROLOGICAL INFORMATION (AIRMET)  
APPROACH HOLD AREA  
PRECIPITATION RADAR WETHER DESCRIPTIONS  
SPECIAL USE AIRSPACE  
WEATHER ADVISORY

f. Editorial/format changes were made where necessary. Revision bars were not used due to the insignificant nature of the changes.





# A

**AAI–**

(See ARRIVAL AIRCRAFT INTERVAL.)

**AAR–**

(See AIRPORT ARRIVAL RATE.)

**ABBREVIATED IFR FLIGHT PLANS–** An authorization by ATC requiring pilots to submit only that information needed for the purpose of ATC. It includes only a small portion of the usual IFR flight plan information. In certain instances, this may be only aircraft identification, location, and pilot request. Other information may be requested if needed by ATC for separation/control purposes. It is frequently used by aircraft which are airborne and desire an instrument approach or by aircraft which are on the ground and desire a climb to VFR-on-top.

(See VFR-ON-TOP.)

(Refer to AIM.)

**ABEAM–** An aircraft is “abeam” a fix, point, or object when that fix, point, or object is approximately 90 degrees to the right or left of the aircraft track. Abeam indicates a general position rather than a precise point.

**ABORT–** To terminate a preplanned aircraft maneuver; e.g., an aborted takeoff.

**ACC [ICAO]–**

(See ICAO term AREA CONTROL CENTER.)

**ACCELERATE-STOP DISTANCE AVAILABLE–** The runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff.

**ACCELERATE-STOP DISTANCE AVAILABLE [ICAO]–** The length of the take-off run available plus the length of the stopway if provided.

**ACDO–**

(See AIR CARRIER DISTRICT OFFICE.)

**ACKNOWLEDGE–** Let me know that you have received and understood this message.

**ACL–**

(See AIRCRAFT LIST.)

**ACLS–**

(See AUTOMATIC CARRIER LANDING SYSTEM.)

**ACLT–**

(See ACTUAL CALCULATED LANDING TIME.)

**ACROBATIC FLIGHT–** An intentional maneuver involving an abrupt change in an aircraft’s attitude, an abnormal attitude, or abnormal acceleration not necessary for normal flight.

(See ICAO term ACROBATIC FLIGHT.)

(Refer to 14 CFR Part 91.)

**ACROBATIC FLIGHT [ICAO]–** Maneuvers intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed.

**ACTIVE RUNWAY–**

(See RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY.)

**ACTUAL CALCULATED LANDING TIME–** ACLT is a flight’s frozen calculated landing time. An actual time determined at freeze calculated landing time (FCLT) or meter list display interval (MLDI) for the adapted vertex for each arrival aircraft based upon runway configuration, airport acceptance rate, airport arrival delay period, and other metered arrival aircraft. This time is either the vertex time of arrival (VTA) of the aircraft or the tentative calculated landing time (TCLT)/ACLT of the previous aircraft plus the arrival aircraft interval (AAI), whichever is later. This time will not be updated in response to the aircraft’s progress.

**ACTUAL NAVIGATION PERFORMANCE (ANP)–**

(See REQUIRED NAVIGATION PERFORMANCE.)

**ADDITIONAL SERVICES–** Advisory information provided by ATC which includes but is not limited to the following:

a. Traffic advisories.

b. Vectors, when requested by the pilot, to assist aircraft receiving traffic advisories to avoid observed traffic.

c. Altitude deviation information of 300 feet or more from an assigned altitude as observed on a verified (reading correctly) automatic altitude readout (Mode C).

d. Advisories that traffic is no longer a factor.

e. Weather and chaff information.

f. Weather assistance.

g. Bird activity information.

h. Holding pattern surveillance. Additional services are provided to the extent possible contingent only upon the controller's capability to fit them into the performance of higher priority duties and on the basis of limitations of the radar, volume of traffic, frequency congestion, and controller workload. The controller has complete discretion for determining if he/she is able to provide or continue to provide a service in a particular case. The controller's reason not to provide or continue to provide a service in a particular case is not subject to question by the pilot and need not be made known to him/her.

(See TRAFFIC ADVISORIES.)

(Refer to AIM.)

ADF–

(See AUTOMATIC DIRECTION FINDER.)

ADIZ–

(See AIR DEFENSE IDENTIFICATION ZONE.)

ADLY–

(See ARRIVAL DELAY.)

ADMINISTRATOR– The Federal Aviation Administrator or any person to whom he/she has delegated his/her authority in the matter concerned.

ADR–

(See AIRPORT DEPARTURE RATE.)

ADS [ICAO]–

(See ICAO term AUTOMATIC DEPENDENT SURVEILLANCE.)

ADS-B–

(See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST.)

ADS-C–

(See AUTOMATIC DEPENDENT SURVEILLANCE–CONTRACT.)

**ADVISE INTENTIONS**– Tell me what you plan to do.

**ADVISORY**– Advice and information provided to assist pilots in the safe conduct of flight and aircraft movement.

(See ADVISORY SERVICE.)

**ADVISORY FREQUENCY**– The appropriate frequency to be used for Airport Advisory Service.

(See LOCAL AIRPORT ADVISORY.)

(See UNICOM.)

(Refer to ADVISORY CIRCULAR NO. 90-42.)

(Refer to AIM.)

**ADVISORY SERVICE**– Advice and information provided by a facility to assist pilots in the safe conduct of flight and aircraft movement.

(See ADDITIONAL SERVICES.)

(See LOCAL AIRPORT ADVISORY.)

(See RADAR ADVISORY.)

(See SAFETY ALERT.)

(See TRAFFIC ADVISORIES.)

(Refer to AIM.)

**AERIAL REFUELING**– A procedure used by the military to transfer fuel from one aircraft to another during flight.

(Refer to VFR/IFR Wall Planning Charts.)

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

**AERODROME BEACON [ICAO]**– Aeronautical beacon used to indicate the location of an aerodrome from the air.

**AERODROME CONTROL SERVICE [ICAO]**– Air traffic control service for aerodrome traffic.

**AERODROME CONTROL TOWER [ICAO]**– A unit established to provide air traffic control service to aerodrome traffic.

**AERODROME ELEVATION [ICAO]**– The elevation of the highest point of the landing area.

**AERODROME TRAFFIC CIRCUIT [ICAO]**– The specified path to be flown by aircraft operating in the vicinity of an aerodrome.

**AERONAUTICAL BEACON**– A visual NAVAID displaying flashes of white and/or colored light to indicate the location of an airport, a heliport, a landmark, a certain point of a Federal airway in mountainous terrain, or an obstruction.

(See AIRPORT ROTATING BEACON.)

(Refer to AIM.)

**AERONAUTICAL CHART**– A map used in air navigation containing all or part of the following: topographic features, hazards and obstructions,

navigation aids, navigation routes, designated airspace, and airports. Commonly used aeronautical charts are:

**a. Sectional Aeronautical Charts (1:500,000)**– Designed for visual navigation of slow or medium speed aircraft. Topographic information on these charts features the portrayal of relief and a judicious selection of visual check points for VFR flight. Aeronautical information includes visual and radio aids to navigation, airports, controlled airspace, permanent special use airspace (SUA), obstructions, and related data.

**b. VFR Terminal Area Charts (1:250,000)**– Depict Class B airspace which provides for the control or segregation of all the aircraft within Class B airspace. The chart depicts topographic information and aeronautical information which includes visual and radio aids to navigation, airports, controlled airspace, permanent SUA, obstructions, and related data.

**c. En Route Low Altitude Charts**– Provide aeronautical information for en route instrument navigation (IFR) in the low altitude stratum. Information includes the portrayal of airways, limits of controlled airspace, position identification and frequencies of radio aids, selected airports, minimum en route and minimum obstruction clearance altitudes, airway distances, reporting points, permanent SUA, and related data. Area charts, which are a part of this series, furnish terminal data at a larger scale in congested areas.

**d. En Route High Altitude Charts**– Provide aeronautical information for en route instrument navigation (IFR) in the high altitude stratum. Information includes the portrayal of jet routes, identification and frequencies of radio aids, selected airports, distances, time zones, special use airspace, and related information.

**e. Instrument Approach Procedure (IAP) Charts**– Portray the aeronautical data which is required to execute an instrument approach to an airport. These charts depict the procedures, including all related data, and the airport diagram. Each procedure is designated for use with a specific type of electronic navigation system including NDB, TACAN, VOR, ILS RNAV and GLS. These charts are identified by the type of navigational aid(s)/equipment required to provide final approach guidance.

**f. Instrument Departure Procedure (DP) Charts**– Designed to expedite clearance delivery and to facilitate transition between takeoff and en route operations. Each DP is presented as a separate chart and may serve a single airport or more than one airport in a given geographical location.

**g. Standard Terminal Arrival (STAR) Charts**– Designed to expedite air traffic control arrival procedures and to facilitate transition between en route and instrument approach operations. Each STAR procedure is presented as a separate chart and may serve a single airport or more than one airport in a given geographical location.

**h. Airport Taxi Charts**– Designed to expedite the efficient and safe flow of ground traffic at an airport. These charts are identified by the official airport name; e.g., Ronald Reagan Washington National Airport.

(See ICAO term AERONAUTICAL CHART.)

**AERONAUTICAL CHART [ICAO]**– A representation of a portion of the earth, its culture and relief, specifically designated to meet the requirements of air navigation.

**AERONAUTICAL INFORMATION MANUAL (AIM)**– A primary FAA publication whose purpose is to instruct airmen about operating in the National Airspace System of the U.S. It provides basic flight information, ATC Procedures and general instructional information concerning health, medical facts, factors affecting flight safety, accident and hazard reporting, and types of aeronautical charts and their use.

**AERONAUTICAL INFORMATION PUBLICATION (AIP) [ICAO]**– A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

(See CHART SUPPLEMENT U.S.)

**AFFIRMATIVE**– Yes.

**AFIS**–

(See AUTOMATIC FLIGHT INFORMATION SERVICE – ALASKA FSSs ONLY.)

**AFP**–

(See AIRSPACE FLOW PROGRAM.)

**AIM**–

(See AERONAUTICAL INFORMATION MANUAL.)

**AIP [ICAO]–**

(See ICAO term AERONAUTICAL INFORMATION PUBLICATION.)

**AIR CARRIER DISTRICT OFFICE–** An FAA field office serving an assigned geographical area, staffed with Flight Standards personnel serving the aviation industry and the general public on matters related to the certification and operation of scheduled air carriers and other large aircraft operations.

**AIR DEFENSE EMERGENCY–** A military emergency condition declared by a designated authority. This condition exists when an attack upon the continental U.S., Alaska, Canada, or U.S. installations in Greenland by hostile aircraft or missiles is considered probable, is imminent, or is taking place.

(Refer to AIM.)

**AIR DEFENSE IDENTIFICATION ZONE (ADIZ)–** An area of airspace over land or water in which the ready identification, location, and control of all aircraft (except for Department of Defense and law enforcement aircraft) is required in the interest of national security.

Note: ADIZ locations and operating and flight plan requirements for civil aircraft operations are specified in 14 CFR Part 99.

(Refer to AIM.)

**AIR NAVIGATION FACILITY–** Any facility used in, available for use in, or designed for use in, aid of air navigation, including landing areas, lights, any apparatus or equipment for disseminating weather information, for signaling, for radio-directional finding, or for radio or other electrical communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing and takeoff of aircraft.

(See NAVIGATIONAL AID.)

**AIR ROUTE SURVEILLANCE RADAR–** Air route traffic control center (ARTCC) radar used primarily to detect and display an aircraft's position while en route between terminal areas. The ARSR enables controllers to provide radar air traffic control service when aircraft are within the ARSR coverage. In some instances, ARSR may enable an ARTCC to provide terminal radar services similar to but usually more limited than those provided by a radar approach control.

**AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC)–** A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

(See EN ROUTE AIR TRAFFIC CONTROL SERVICES.)

(Refer to AIM.)

**AIR TAXI–** Used to describe a helicopter/VTOL aircraft movement conducted above the surface but normally not above 100 feet AGL. The aircraft may proceed either via hover taxi or flight at speeds more than 20 knots. The pilot is solely responsible for selecting a safe airspeed/altitude for the operation being conducted.

(See HOVER TAXI.)

(Refer to AIM.)

**AIR TRAFFIC–** Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

(See ICAO term AIR TRAFFIC.)

**AIR TRAFFIC [ICAO]–** All aircraft in flight or operating on the maneuvering area of an aerodrome.

**AIR TRAFFIC CLEARANCE–** An authorization by air traffic control for the purpose of preventing collision between known aircraft, for an aircraft to proceed under specified traffic conditions within controlled airspace. The pilot-in-command of an aircraft may not deviate from the provisions of a visual flight rules (VFR) or instrument flight rules (IFR) air traffic clearance except in an emergency or unless an amended clearance has been obtained. Additionally, the pilot may request a different clearance from that which has been issued by air traffic control (ATC) if information available to the pilot makes another course of action more practicable or if aircraft equipment limitations or company procedures forbid compliance with the clearance issued. Pilots may also request clarification or amendment, as appropriate, any time a clearance is not fully understood, or considered unacceptable because of safety of flight. Controllers should, in such instances and to the extent of operational practicality and safety, honor the pilot's request. 14 CFR Part 91.3(a) states: "The pilot in command of an aircraft is directly responsible for, and is the

final authority as to, the operation of that aircraft.”  
**THE PILOT IS RESPONSIBLE TO REQUEST AN AMENDED CLEARANCE** if ATC issues a clearance that would cause a pilot to deviate from a rule or regulation, or in the pilot’s opinion, would place the aircraft in jeopardy.

(See ATC INSTRUCTIONS.)

(See ICAO term AIR TRAFFIC CONTROL CLEARANCE.)

**AIR TRAFFIC CONTROL**– A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.

(See ICAO term AIR TRAFFIC CONTROL SERVICE.)

**AIR TRAFFIC CONTROL CLEARANCE [ICAO]**– Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

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

Note 2: The abbreviated term clearance may be prefixed by the words taxi, takeoff, departure, en route, approach or landing to indicate the particular portion of flight to which the air traffic control clearance relates.

**AIR TRAFFIC CONTROL SERVICE**–

(See AIR TRAFFIC CONTROL.)

**AIR TRAFFIC CONTROL SERVICE [ICAO]**– A service provided for the purpose of:

**a.** Preventing collisions:

**1.** Between aircraft; and

**2.** On the maneuvering area between aircraft and obstructions.

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

**AIR TRAFFIC CONTROL SPECIALIST**– A person authorized to provide air traffic control service.

(See AIR TRAFFIC CONTROL.)

(See FLIGHT SERVICE STATION.)

(See ICAO term CONTROLLER.)

**AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER (ATCSCC)**– An Air Traffic Tactical Operations facility responsible for monitoring and managing the flow of air traffic throughout the NAS, producing a safe, orderly, and expeditious flow of traffic while minimizing delays. The following functions are located at the ATCSCC:

**a.** Central Altitude Reservation Function (CARF). Responsible for coordinating, planning, and approving special user requirements under the Altitude Reservation (ALTRV) concept.

(See ALTITUDE RESERVATION.)

**b.** Airport Reservation Office (ARO). Monitors the operation and allocation of reservations for unscheduled operations at airports designated by the Administrator as High Density Airports. These airports are generally known as slot controlled airports. The ARO allocates reservations on a first come, first served basis determined by the time the request is received at the ARO.

(Refer to 14 CFR Part 93.)

(See CHART SUPPLEMENT U.S.)

**c.** U.S. Notice to Airmen (NOTAM) Office. Responsible for collecting, maintaining, and distributing NOTAMs for the U.S. civilian and military, as well as international aviation communities.

(See NOTICE TO AIRMEN.)

**d.** Weather Unit. Monitor all aspects of weather for the U.S. that might affect aviation including cloud cover, visibility, winds, precipitation, thunderstorms, icing, turbulence, and more. Provide forecasts based on observations and on discussions with meteorologists from various National Weather Service offices, FAA facilities, airlines, and private weather services.

**AIR TRAFFIC SERVICE**– A generic term meaning:

**a.** Flight Information Service.

**b.** Alerting Service.

**c.** Air Traffic Advisory Service.

**d.** Air Traffic Control Service:

**1.** Area Control Service,

**2.** Approach Control Service, or

**3.** Airport Control Service.

**AIR TRAFFIC SERVICE (ATS) ROUTES** – The term “ATS Route” is a generic term that includes “VOR Federal airways,” “colored Federal airways,” “jet routes,” and “RNAV routes.” The term “ATS route” does not replace these more familiar route names, but serves only as an overall title when listing the types of routes that comprise the United States route structure.

**AIRBORNE**– An aircraft is considered airborne when all parts of the aircraft are off the ground.

**AIRBORNE DELAY**– Amount of delay to be encountered in airborne holding.

**AIRCRAFT**– Device(s) that are used or intended to be used for flight in the air, and when used in air traffic control terminology, may include the flight crew.

(See ICAO term **AIRCRAFT**.)

**AIRCRAFT [ICAO]**– Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

**AIRCRAFT APPROACH CATEGORY**– A grouping of aircraft based on a speed of 1.3 times the stall speed in the landing configuration at maximum gross landing weight. An aircraft must fit in only one category. If it is necessary to maneuver at speeds in excess of the upper limit of a speed range for a category, the minimums for the category for that speed must be used. For example, an aircraft which falls in Category A, but is circling to land at a speed in excess of 91 knots, must use the approach Category B minimums when circling to land. The categories are as follows:

- a. Category A– Speed less than 91 knots.
  - b. Category B– Speed 91 knots or more but less than 121 knots.
  - c. Category C– Speed 121 knots or more but less than 141 knots.
  - d. Category D– Speed 141 knots or more but less than 166 knots.
  - e. Category E– Speed 166 knots or more.
- (Refer to 14 CFR Part 97.)

**AIRCRAFT CLASSES**– For the purposes of Wake Turbulence Separation Minima, ATC classifies aircraft as Super, Heavy, Large, and Small as follows:

- a. Super. The Airbus A-380-800 (A388) and the Antonov An-225 (A225) are classified as super.
  - b. Heavy– Aircraft capable of takeoff weights of 300,000 pounds or more whether or not they are operating at this weight during a particular phase of flight.
  - c. Large– Aircraft of more than 41,000 pounds, maximum certificated takeoff weight, up to but not including 300,000 pounds.
  - d. Small– Aircraft of 41,000 pounds or less maximum certificated takeoff weight.
- (Refer to AIM.)

**AIRCRAFT CONFLICT**– Predicted conflict, within EDST of two aircraft, or between aircraft and airspace. A Red alert is used for conflicts when the predicted minimum separation is 5 nautical miles or less. A Yellow alert is used when the predicted minimum separation is between 5 and approximately 12 nautical miles. A Blue alert is used for conflicts between an aircraft and predefined airspace.

(See EN ROUTE DECISION SUPPORT TOOL.)

**AIRCRAFT LIST (ACL)**– A view available with EDST that lists aircraft currently in or predicted to be in a particular sector's airspace. The view contains textual flight data information in line format and may be sorted into various orders based on the specific needs of the sector team.

(See EN ROUTE DECISION SUPPORT TOOL.)

**AIRCRAFT SURGE LAUNCH AND RECOVERY**– Procedures used at USAF bases to provide increased launch and recovery rates in instrument flight rules conditions. ASLAR is based on:

- a. Reduced separation between aircraft which is based on time or distance. Standard arrival separation applies between participants including multiple flights until the DRAG point. The DRAG point is a published location on an ASLAR approach where aircraft landing second in a formation slows to a predetermined airspeed. The DRAG point is the reference point at which MARSA applies as expanding elements effect separation within a flight or between subsequent participating flights.

- b. ASLAR procedures shall be covered in a Letter of Agreement between the responsible USAF military ATC facility and the concerned Federal Aviation Administration facility. Initial Approach Fix spacing requirements are normally addressed as a minimum.

**AIRMEN'S METEOROLOGICAL INFORMATION (AIRMET)**– In-flight weather advisories issued only to amend the Aviation Surface Forecast, Aviation Cloud Forecast, or area forecast concerning weather phenomena which are of operational interest to all aircraft and potentially hazardous to aircraft having limited capability because of lack of equipment, instrumentation, or pilot qualifications. AIRMETs concern weather of less severity than that covered by SIGMETs or Convective SIGMETs.

**AIRMETs** cover moderate icing, moderate turbulence, sustained winds of 30 knots or more at the surface, widespread areas of ceilings less than 1,000 feet and/or visibility less than 3 miles, and extensive mountain obscurement.

(See AWW.)

(See CONVECTIVE SIGMET.)

(See CWA.)

(See SIGMET.)

(Refer to AIM.)

**AIRPORT**— An area on land or water that is used or intended to be used for the landing and takeoff of aircraft and includes its buildings and facilities, if any.

**AIRPORT ADVISORY AREA**— The area within ten miles of an airport without a control tower or where the tower is not in operation, and on which a Flight Service Station is located.

(See LOCAL AIRPORT ADVISORY.)

(Refer to AIM.)

**AIRPORT ARRIVAL RATE (AAR)**— A dynamic input parameter specifying the number of arriving aircraft which an airport or airspace can accept from the ARTCC per hour. The AAR is used to calculate the desired interval between successive arrival aircraft.

**AIRPORT DEPARTURE RATE (ADR)**— A dynamic parameter specifying the number of aircraft which can depart an airport and the airspace can accept per hour.

**AIRPORT ELEVATION**— The highest point of an airport's usable runways measured in feet from mean sea level.

(See TOUCHDOWN ZONE ELEVATION.)

(See ICAO term AERODROME ELEVATION.)

**AIRPORT LIGHTING**— Various lighting aids that may be installed on an airport. Types of airport lighting include:

**a. Approach Light System (ALS)**— An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended centerline of the runway on his/her final approach for landing. Condenser-Discharge Sequential Flashing Lights/Sequenced Flashing Lights may be installed in conjunction with

the ALS at some airports. Types of Approach Light Systems are:

**1. ALSF-1**— Approach Light System with Sequenced Flashing Lights in ILS Cat-I configuration.

**2. ALSF-2**— Approach Light System with Sequenced Flashing Lights in ILS Cat-II configuration. The ALSF-2 may operate as an SSALR when weather conditions permit.

**3. SSALF**— Simplified Short Approach Light System with Sequenced Flashing Lights.

**4. SSALR**— Simplified Short Approach Light System with Runway Alignment Indicator Lights.

**5. MALSF**— Medium Intensity Approach Light System with Sequenced Flashing Lights.

**6. MALSR**— Medium Intensity Approach Light System with Runway Alignment Indicator Lights.

**7. RLLS**— Runway Lead-in Light System Consists of one or more series of flashing lights installed at or near ground level that provides positive visual guidance along an approach path, either curving or straight, where special problems exist with hazardous terrain, obstructions, or noise abatement procedures.

**8. RAIL**— Runway Alignment Indicator Lights—Sequenced Flashing Lights which are installed only in combination with other light systems.

**9. ODALS**— Omnidirectional Approach Lighting System consists of seven omnidirectional flashing lights located in the approach area of a nonprecision runway. Five lights are located on the runway centerline extended with the first light located 300 feet from the threshold and extending at equal intervals up to 1,500 feet from the threshold. The other two lights are located, one on each side of the runway threshold, at a lateral distance of 40 feet from the runway edge, or 75 feet from the runway edge when installed on a runway equipped with a VASI.

(Refer to FAA Order JO 6850.2, VISUAL GUIDANCE LIGHTING SYSTEMS.)

**b. Runway Lights/Runway Edge Lights**— Lights having a prescribed angle of emission used to define the lateral limits of a runway. Runway lights are uniformly spaced at intervals of approximately 200 feet, and the intensity may be controlled or preset.

**c. Touchdown Zone Lighting**— Two rows of transverse light bars located symmetrically about the

runway centerline normally at 100 foot intervals. The basic system extends 3,000 feet along the runway.

**d. Runway Centerline Lighting**– Flush centerline lights spaced at 50-foot intervals beginning 75 feet from the landing threshold and extending to within 75 feet of the opposite end of the runway.

**e. Threshold Lights**– Fixed green lights arranged symmetrically left and right of the runway centerline, identifying the runway threshold.

**f. Runway End Identifier Lights (REIL)**– Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

**g. Visual Approach Slope Indicator (VASI)**– An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he/she is “on path” if he/she sees red/white, “above path” if white/white, and “below path” if red/red. Some airports serving large aircraft have three-bar VASIs which provide two visual glide paths to the same runway.

**h. Precision Approach Path Indicator (PAPI)**– An airport lighting facility, similar to VASI, providing vertical approach slope guidance to aircraft during approach to landing. PAPIs consist of a single row of either two or four lights, normally installed on the left side of the runway, and have an effective visual range of about 5 miles during the day and up to 20 miles at night. PAPIs radiate a directional pattern of high intensity red and white focused light beams which indicate that the pilot is “on path” if the pilot sees an equal number of white lights and red lights, with white to the left of the red; “above path” if the pilot sees more white than red lights; and “below path” if the pilot sees more red than white lights.

**i. Boundary Lights**– Lights defining the perimeter of an airport or landing area.

(Refer to AIM.)

**AIRPORT MARKING AIDS**– Markings used on runway and taxiway surfaces to identify a specific runway, a runway threshold, a centerline, a hold line, etc. A runway should be marked in accordance with its present usage such as:

**a. Visual.**

**b. Nonprecision instrument.**

**c. Precision instrument.**

(Refer to AIM.)

**AIRPORT REFERENCE POINT (ARP)**– The approximate geometric center of all usable runway surfaces.

**AIRPORT RESERVATION OFFICE**– Office responsible for monitoring the operation of slot controlled airports. It receives and processes requests for unscheduled operations at slot controlled airports.

**AIRPORT ROTATING BEACON**– A visual NAVAID operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport. At military airports, the beacons flash alternately white and green, but are differentiated from civil beacons by dualpeaked (two quick) white flashes between the green flashes.

(See INSTRUMENT FLIGHT RULES.)

(See SPECIAL VFR OPERATIONS.)

(See ICAO term AERODROME BEACON.)

(Refer to AIM.)

**AIRPORT STREAM FILTER (ASF)**– An on/off filter that allows the conflict notification function to be inhibited for arrival streams into single or multiple airports to prevent nuisance alerts.

**AIRPORT SURFACE DETECTION EQUIPMENT (ASDE)**– Surveillance equipment specifically designed to detect aircraft, vehicular traffic, and other objects, on the surface of an airport, and to present the image on a tower display. Used to augment visual observation by tower personnel of aircraft and/or vehicular movements on runways and taxiways. There are three ASDE systems deployed in the NAS:

**a. ASDE-3**– a Surface Movement Radar.

**b. ASDE-X**– a system that uses an X-band Surface Movement Radar, multilateration, and ADS-B.

**c. Airport Surface Surveillance Capability (ASSC)**– A system that uses Surface Movement Radar, multilateration, and ADS-B.

**AIRPORT SURVEILLANCE RADAR**– Approach control radar used to detect and display an aircraft’s position in the terminal area. ASR provides range and azimuth information but does not provide elevation data. Coverage of the ASR can extend up to 60 miles.

**AIRPORT TAXI CHARTS**–

(See AERONAUTICAL CHART.)



**AIRPORT TRAFFIC CONTROL SERVICE**– A service provided by a control tower for aircraft operating on the movement area and in the vicinity of an airport.

(See MOVEMENT AREA.)

(See TOWER.)

(See ICAO term AERODROME CONTROL SERVICE.)

**AIRPORT TRAFFIC CONTROL TOWER**–

(See TOWER.)

**AIRSPACE CONFLICT**– Predicted conflict of an aircraft and active Special Activity Airspace (SAA).

**AIRSPACE FLOW PROGRAM (AFP)**– AFP is a Traffic Management (TM) process administered by the Air Traffic Control System Command Center (ATCSCC) where aircraft are assigned an Expect Departure Clearance Time (EDCT) in order to manage capacity and demand for a specific area of the National Airspace System (NAS). The purpose of the program is to mitigate the effects of en route constraints. It is a flexible program and may be implemented in various forms depending upon the needs of the air traffic system.

**AIRSPACE HIERARCHY**– Within the airspace classes, there is a hierarchy and, in the event of an overlap of airspace: Class A preempts Class B, Class B preempts Class C, Class C preempts Class D, Class D preempts Class E, and Class E preempts Class G.

**AIRSPEED**– The speed of an aircraft relative to its surrounding air mass. The unqualified term “airspeed” means one of the following:

**a. Indicated Airspeed**– The speed shown on the aircraft airspeed indicator. This is the speed used in pilot/controller communications under the general term “airspeed.”

(Refer to 14 CFR Part 1.)

**b. True Airspeed**– The airspeed of an aircraft relative to undisturbed air. Used primarily in flight planning and en route portion of flight. When used in pilot/controller communications, it is referred to as “true airspeed” and not shortened to “airspeed.”

**AIRSTART**– The starting of an aircraft engine while the aircraft is airborne, preceded by engine shutdown during training flights or by actual engine failure.

**AIRWAY**– A Class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids.

(See FEDERAL AIRWAYS.)

(See ICAO term AIRWAY.)

(Refer to 14 CFR Part 71.)

(Refer to AIM.)

**AIRWAY [ICAO]**– A control area or portion thereof established in the form of corridor equipped with radio navigational aids.

**AIRWAY BEACON**– Used to mark airway segments in remote mountain areas. The light flashes Morse Code to identify the beacon site.

(Refer to AIM.)

**AIT**–

(See AUTOMATED INFORMATION TRANSFER.)

**ALERFA (Alert Phase) [ICAO]**– A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

**ALERT**– A notification to a position that there is an aircraft-to-aircraft or aircraft-to-airspace conflict, as detected by Automated Problem Detection (APD).

**ALERT AREA**–

(See SPECIAL USE AIRSPACE.)

**ALERT NOTICE (ALNOT)**– A request originated by a flight service station (FSS) or an air route traffic control center (ARTCC) for an extensive communication search for overdue, unreported, or missing aircraft.

**ALERTING SERVICE**– A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid and assist such organizations as required.

**ALNOT**–

(See ALERT NOTICE.)

**ALONG-TRACK DISTANCE (ATD)**– The horizontal distance between the aircraft’s current position and a fix measured by an area navigation system that is not subject to slant range errors.

**ALPHANUMERIC DISPLAY**– Letters and numerals used to show identification, altitude, beacon code, and other information concerning a target on a radar display.

(See AUTOMATED RADAR TERMINAL SYSTEMS.)

**ALTERNATE AERODROME [ICAO]**– An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing.

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

**ALTERNATE AIRPORT**– An airport at which an aircraft may land if a landing at the intended airport becomes inadvisable.

(See ICAO term ALTERNATE AERODROME.)

**ALTITUDE SETTING**– The barometric pressure reading used to adjust a pressure altimeter for variations in existing atmospheric pressure or to the standard altimeter setting (29.92).

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**ALTITUDE**– The height of a level, point, or object measured in feet Above Ground Level (AGL) or from Mean Sea Level (MSL).

(See FLIGHT LEVEL.)

**a. MSL Altitude**– Altitude expressed in feet measured from mean sea level.

**b. AGL Altitude**– Altitude expressed in feet measured above ground level.

**c. Indicated Altitude**– The altitude as shown by an altimeter. On a pressure or barometric altimeter it is altitude as shown uncorrected for instrument error and uncompensated for variation from standard atmospheric conditions.

(See ICAO term ALTITUDE.)

**ALTITUDE [ICAO]**– The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

**ALTITUDE READOUT**– An aircraft's altitude, transmitted via the Mode C transponder feature, that is visually displayed in 100-foot increments on a radar scope having readout capability.

(See ALPHANUMERIC DISPLAY.)

(See AUTOMATED RADAR TERMINAL SYSTEMS.)

(Refer to AIM.)

**ALTITUDE RESERVATION (ALTRV)**– Airspace utilization under prescribed conditions normally employed for the mass movement of aircraft or other special user requirements which cannot otherwise be

accomplished. ALTRVs are approved by the appropriate FAA facility.

(See AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER.)

**ALTITUDE RESTRICTION**– An altitude or altitudes, stated in the order flown, which are to be maintained until reaching a specific point or time. Altitude restrictions may be issued by ATC due to traffic, terrain, or other airspace considerations.

**ALTITUDE RESTRICTIONS ARE CANCELED**–

Adherence to previously imposed altitude restrictions is no longer required during a climb or descent.

**ALTRV**–

(See ALTITUDE RESERVATION.)

**AMVER**–

(See AUTOMATED MUTUAL-ASSISTANCE VESSEL RESCUE SYSTEM.)

**APB**–

(See AUTOMATED PROBLEM DETECTION BOUNDARY.)

**APD**–

(See AUTOMATED PROBLEM DETECTION.)

**APDIA**–

(See AUTOMATED PROBLEM DETECTION INHIBITED AREA.)

**APPROACH CLEARANCE**– Authorization by ATC for a pilot to conduct an instrument approach. The type of instrument approach for which a clearance and other pertinent information is provided in the approach clearance when required.

(See CLEARED APPROACH.)

(See INSTRUMENT APPROACH PROCEDURE.)

(Refer to AIM.)

(Refer to 14 CFR Part 91.)

**APPROACH CONTROL FACILITY**– A terminal ATC facility that provides approach control service in a terminal area.

(See APPROACH CONTROL SERVICE.)

(See RADAR APPROACH CONTROL FACILITY.)

**APPROACH CONTROL SERVICE**– Air traffic control service provided by an approach control facility for arriving and departing VFR/IFR aircraft and, on occasion, en route aircraft. At some airports

not served by an approach control facility, the ARTCC provides limited approach control service.

(See ICAO term **APPROACH CONTROL SERVICE**.)

(Refer to AIM.)

**APPROACH CONTROL SERVICE [ICAO]**– Air traffic control service for arriving or departing controlled flights.

**APPROACH GATE**– An imaginary point used within ATC as a basis for vectoring aircraft to the final approach course. The gate will be established along the final approach course 1 mile from the final approach fix on the side away from the airport and will be no closer than 5 miles from the landing threshold.

**APPROACH/DEPARTURE HOLD AREA**– The locations on taxiways in the approach or departure areas of a runway designated to protect landing or departing aircraft. These locations are identified by signs and markings.

**APPROACH LIGHT SYSTEM**–

(See **AIRPORT LIGHTING**.)

**APPROACH SEQUENCE**– The order in which aircraft are positioned while on approach or awaiting approach clearance.

(See **LANDING SEQUENCE**.)

(See ICAO term **APPROACH SEQUENCE**.)

**APPROACH SEQUENCE [ICAO]**– The order in which two or more aircraft are cleared to approach to land at the aerodrome.

**APPROACH SPEED**– The recommended speed contained in aircraft manuals used by pilots when making an approach to landing. This speed will vary for different segments of an approach as well as for aircraft weight and configuration.

**APPROACH WITH VERTICAL GUIDANCE (APV)**– A term used to describe RNAV approach procedures that provide lateral and vertical guidance but do not meet the requirements to be considered a precision approach.

**APPROPRIATE ATS AUTHORITY [ICAO]**– The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned. In the United States, the “appropriate ATS authority” is the Program Director for Air Traffic Planning and Procedures, ATP-1.

**APPROPRIATE AUTHORITY**–

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

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

**APPROPRIATE OBSTACLE CLEARANCE**

**MINIMUM ALTITUDE**– Any of the following:

(See **MINIMUM EN ROUTE IFR ALTITUDE**.)

(See **MINIMUM IFR ALTITUDE**.)

(See **MINIMUM OBSTRUCTION CLEARANCE ALTITUDE**.)

(See **MINIMUM VECTORING ALTITUDE**.)

**APPROPRIATE TERRAIN CLEARANCE**

**MINIMUM ALTITUDE**– Any of the following:

(See **MINIMUM EN ROUTE IFR ALTITUDE**.)

(See **MINIMUM IFR ALTITUDE**.)

(See **MINIMUM OBSTRUCTION CLEARANCE ALTITUDE**.)

(See **MINIMUM VECTORING ALTITUDE**.)

**APRON**– A defined area on an airport or heliport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance. With regard to seaplanes, a ramp is used for access to the apron from the water.

(See ICAO term **APRON**.)

**APRON [ICAO]**– A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, refueling, parking or maintenance.

**ARC**– The track over the ground of an aircraft flying at a constant distance from a navigational aid by reference to distance measuring equipment (DME).

**AREA CONTROL CENTER [ICAO]**– An air traffic control facility primarily responsible for ATC services being provided IFR aircraft during the en route phase of flight. The U.S. equivalent facility is an air route traffic control center (ARTCC).

**AREA NAVIGATION (RNAV)**– A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Note: Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

**AREA NAVIGATION (RNAV) APPROACH CONFIGURATION:**

**a. STANDARD T**– An RNAV approach whose design allows direct flight to any one of three initial approach fixes (IAF) and eliminates the need for procedure turns. The standard design is to align the procedure on the extended centerline with the missed approach point (MAP) at the runway threshold, the final approach fix (FAF), and the initial approach/intermediate fix (IAF/IF). The other two IAFs will be established perpendicular to the IF.

**b. MODIFIED T**– An RNAV approach design for single or multiple runways where terrain or operational constraints do not allow for the standard T. The “T” may be modified by increasing or decreasing the angle from the corner IAF(s) to the IF or by eliminating one or both corner IAFs.

**c. STANDARD I**– An RNAV approach design for a single runway with both corner IAFs eliminated. Course reversal or radar vectoring may be required at busy terminals with multiple runways.

**d. TERMINAL ARRIVAL AREA (TAA)**– The TAA is controlled airspace established in conjunction with the Standard or Modified T and I RNAV approach configurations. In the standard TAA, there are three areas: straight-in, left base, and right base. The arc boundaries of the three areas of the TAA are published portions of the approach and allow aircraft to transition from the en route structure direct to the nearest IAF. TAAs will also eliminate or reduce feeder routes, departure extensions, and procedure turns or course reversal.

**1. STRAIGHT-IN AREA**– A 30NM arc centered on the IF bounded by a straight line extending through the IF perpendicular to the intermediate course.

**2. LEFT BASE AREA**– A 30NM arc centered on the right corner IAF. The area shares a boundary with the straight-in area except that it extends out for 30NM from the IAF and is bounded on the other side by a line extending from the IF through the FAF to the arc.

**3. RIGHT BASE AREA**– A 30NM arc centered on the left corner IAF. The area shares a boundary with the straight-in area except that it extends out for 30NM from the IAF and is bounded on the other side by a line extending from the IF through the FAF to the arc.

**AREA NAVIGATION (RNAV) GLOBAL POSITIONING SYSTEM (GPS) PRECISION RUNWAY MONITORING (PRM) APPROACH**

A GPS approach, which requires vertical guidance, used in lieu of an ILS PRM approach to conduct approaches to parallel runways whose extended centerlines are separated by less than 4,300 feet and at least 3,000 feet, where simultaneous close parallel approaches are permitted. Also used in lieu of an ILS PRM and/or LDA PRM approach to conduct Simultaneous Offset Instrument Approach (SOIA) operations.

**ARINC**– An acronym for Aeronautical Radio, Inc., a corporation largely owned by a group of airlines. ARINC is licensed by the FCC as an aeronautical station and contracted by the FAA to provide communications support for air traffic control and meteorological services in portions of international airspace.

**ARMY AVIATION FLIGHT INFORMATION BULLETIN**– A bulletin that provides air operation data covering Army, National Guard, and Army Reserve aviation activities.

**ARO**–

(See AIRPORT RESERVATION OFFICE.)

**ARRESTING SYSTEM**– A safety device consisting of two major components, namely, engaging or catching devices and energy absorption devices for the purpose of arresting both tailhook and/or nontailhook-equipped aircraft. It is used to prevent aircraft from overrunning runways when the aircraft cannot be stopped after landing or during aborted takeoff. Arresting systems have various names; e.g., arresting gear, hook device, wire barrier cable.

(See ABORT.)

(Refer to AIM.)

**ARRIVAL AIRCRAFT INTERVAL**– An internally generated program in hundredths of minutes based upon the AAR. AAI is the desired optimum interval between successive arrival aircraft over the vertex.

**ARRIVAL CENTER**– The ARTCC having jurisdiction for the impacted airport.

**ARRIVAL DELAY**– A parameter which specifies a period of time in which no aircraft will be metered for arrival at the specified airport.

**ARRIVAL SECTOR**– An operational control sector containing one or more meter fixes.

**ARRIVAL SECTOR ADVISORY LIST**– An ordered list of data on arrivals displayed at the

PVD/MDM of the sector which controls the meter fix.

**ARRIVAL SEQUENCING PROGRAM**– The automated program designed to assist in sequencing aircraft destined for the same airport.

**ARRIVAL TIME**– The time an aircraft touches down on arrival.

**ARSR**–  
(See AIR ROUTE SURVEILLANCE RADAR.)

**ARTCC**–  
(See AIR ROUTE TRAFFIC CONTROL CENTER.)

**ARTS**–  
(See AUTOMATED RADAR TERMINAL SYSTEMS.)

**ASDA**–  
(See ACCELERATE-STOP DISTANCE AVAILABLE.)

**ASDA [ICAO]**–  
(See ICAO Term ACCELERATE-STOP DISTANCE AVAILABLE.)

**ASDE**–  
(See AIRPORT SURFACE DETECTION EQUIPMENT.)

**ASF**–  
(See AIRPORT STREAM FILTER.)

**ASLAR**–  
(See AIRCRAFT SURGE LAUNCH AND RECOVERY.)

**ASP**–  
(See ARRIVAL SEQUENCING PROGRAM.)

**ASR**–  
(See AIRPORT SURVEILLANCE RADAR.)

**ASR APPROACH**–  
(See SURVEILLANCE APPROACH.)

**ASSOCIATED**– A radar target displaying a data block with flight identification and altitude information.  
(See UNASSOCIATED.)

**ATC**–  
(See AIR TRAFFIC CONTROL.)

**ATC ADVISES**– Used to prefix a message of noncontrol information when it is relayed to an aircraft by other than an air traffic controller.

(See ADVISORY.)

**ATC ASSIGNED AIRSPACE**– Airspace of defined vertical/lateral limits, assigned by ATC, for the purpose of providing air traffic segregation between the specified activities being conducted within the assigned airspace and other IFR air traffic.

(See SPECIAL USE AIRSPACE.)

**ATC CLEARANCE**–  
(See AIR TRAFFIC CLEARANCE.)

**ATC CLEARS**– Used to prefix an ATC clearance when it is relayed to an aircraft by other than an air traffic controller.

**ATC INSTRUCTIONS**– Directives issued by air traffic control for the purpose of requiring a pilot to take specific actions; e.g., “Turn left heading two five zero,” “Go around,” “Clear the runway.”

(Refer to 14 CFR Part 91.)

**ATC PREFERRED ROUTE NOTIFICATION**– EDST notification to the appropriate controller of the need to determine if an ATC preferred route needs to be applied, based on destination airport.

(See ROUTE ACTION NOTIFICATION.)

(See EN ROUTE DECISION SUPPORT TOOL.)

**ATC PREFERRED ROUTES**– Preferred routes that are not automatically applied by Host.

**ATC REQUESTS**– Used to prefix an ATC request when it is relayed to an aircraft by other than an air traffic controller.

**ATC SECURITY SERVICES**– Communications and security tracking provided by an ATC facility in support of the DHS, the DOD, or other Federal security elements in the interest of national security. Such security services are only applicable within designated areas. ATC security services do not include ATC basic radar services or flight following.

**ATC SECURITY SERVICES POSITION**– The position responsible for providing ATC security services as defined. This position does not provide ATC, IFR separation, or VFR flight following services, but is responsible for providing security services in an area comprising airspace assigned to one or more ATC operating sectors. This position may be combined with control positions.

**ATC SECURITY TRACKING**– The continuous tracking of aircraft movement by an ATC facility in

support of the DHS, the DOD, or other security elements for national security using radar (i.e., radar tracking) or other means (e.g., manual tracking) without providing basic radar services (including traffic advisories) or other ATC services not defined in this section.

**ATS SURVEILLANCE SERVICE [ICAO]**– A term used to indicate a service provided directly by means of an ATS surveillance system.

**ATC SURVEILLANCE SOURCE**– Used by ATC for establishing identification, control and separation using a target depicted on an air traffic control facility's video display that has met the relevant safety standards for operational use and received from one, or a combination, of the following surveillance sources:

- a. Radar (See RADAR.)
- b. ADS-B (See AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST.)
- c. WAM (See WIDE AREA MULTILATERATION.)  
(See INTERROGATOR.)  
(See TRANSPONDER.)  
(See ICAO term RADAR.)  
(Refer to AIM.)

**ATS SURVEILLANCE SYSTEM [ICAO]**– A generic term meaning variously, ADS–B, PSR, SSR or any comparable ground–based system that enables the identification of aircraft.

Note: A comparable ground–based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.

**ATCAA**–  
(See ATC ASSIGNED AIRSPACE.)

**ATCRBS**–  
(See RADAR.)

**ATCSCC**–  
(See AIR TRAFFIC CONTROL SYSTEM  
COMMAND CENTER.)

**ATCT**–  
(See TOWER.)

**ATD**–  
(See ALONG–TRACK DISTANCE.)

**ATIS**–  
(See AUTOMATIC TERMINAL INFORMATION  
SERVICE.)

**ATIS [ICAO]**–

(See ICAO Term AUTOMATIC TERMINAL  
INFORMATION SERVICE.)

**ATS ROUTE [ICAO]**– A specified route designed for channeling the flow of traffic as necessary for the provision of air traffic services.

Note: The term “ATS Route” is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure, etc.

**ATTENTION ALL USERS PAGE (AAUP)**– The AAUP provides the pilot with additional information relative to conducting a specific operation, for example, PRM approaches and RNAV departures.

**AUTOLAND APPROACH**–An autoland system aids by providing control of aircraft systems during a precision instrument approach to at least decision altitude and possibly all the way to touchdown, as well as in some cases, through the landing rollout. The autoland system is a sub-system of the autopilot system from which control surface management occurs. The aircraft autopilot sends instructions to the autoland system and monitors the autoland system performance and integrity during its execution.

**AUTOMATED INFORMATION TRANSFER (AIT)**– A precoordinated process, specifically defined in facility directives, during which a transfer of altitude control and/or radar identification is accomplished without verbal coordination between controllers using information communicated in a full data block.

**AUTOMATED MUTUAL-ASSISTANCE VESSEL RESCUE SYSTEM**– A facility which can deliver, in a matter of minutes, a surface picture (SURPIC) of vessels in the area of a potential or actual search and rescue incident, including their predicted positions and their characteristics.

(See FAA Order JO 7110.65, Para 10–6–4,  
INFLIGHT CONTINGENCIES.)

**AUTOMATED PROBLEM DETECTION (APD)**– An Automation Processing capability that compares trajectories in order to predict conflicts.

**AUTOMATED PROBLEM DETECTION BOUNDARY (APB)**– The adapted distance beyond a facilities boundary defining the airspace within which EDST performs conflict detection.

(See EN ROUTE DECISION SUPPORT TOOL.)

**AUTOMATED PROBLEM DETECTION INHIBITED AREA (APDIA)**– Airspace surrounding a

terminal area within which APD is inhibited for all flights within that airspace.

**AUTOMATED RADAR TERMINAL SYSTEMS (ARTS)**– A generic term for several tracking systems included in the Terminal Automation Systems (TAS). ARTS plus a suffix roman numeral denotes a major modification to that system.

**a. ARTS IIIA.** The Radar Tracking and Beacon Tracking Level (RT&BTL) of the modular, programmable automated radar terminal system. ARTS IIIA detects, tracks, and predicts primary as well as secondary radar-derived aircraft targets. This more sophisticated computer-driven system upgrades the existing ARTS III system by providing improved tracking, continuous data recording, and fail-soft capabilities.

**b. Common ARTS.** Includes ARTS IIE, ARTS IIIIE; and ARTS IIIIE with ACD (see DTAS) which combines functionalities of the previous ARTS systems.

**AUTOMATED WEATHER SYSTEM**– Any of the automated weather sensor platforms that collect weather data at airports and disseminate the weather information via radio and/or landline. The systems currently consist of the Automated Surface Observing System (ASOS), Automated Weather Sensor System (AWSS) and Automated Weather Observation System (AWOS).

**AUTOMATED UNICOM**– Provides completely automated weather, radio check capability and airport advisory information on an Automated UNICOM system. These systems offer a variety of features, typically selectable by microphone clicks, on the UNICOM frequency. Availability will be published in the Chart Supplement U.S. and approach charts.

**AUTOMATIC ALTITUDE REPORT**–  
(See ALTITUDE READOUT.)

**AUTOMATIC ALTITUDE REPORTING**– That function of a transponder which responds to Mode C interrogations by transmitting the aircraft's altitude in 100-foot increments.

**AUTOMATIC CARRIER LANDING SYSTEM**– U.S. Navy final approach equipment consisting of precision tracking radar coupled to a computer data link to provide continuous information to the aircraft,

monitoring capability to the pilot, and a backup approach system.

**AUTOMATIC DEPENDENT SURVEILLANCE (ADS)** [ICAO]– A surveillance technique in which aircraft automatically provide, via a data link, data derived from on-board navigation and position fixing systems, including aircraft identification, four dimensional position and additional data as appropriate.

**AUTOMATIC DEPENDENT SURVEILLANCE–BROADCAST (ADS-B)**– A surveillance system in which an aircraft or vehicle to be detected is fitted with cooperative equipment in the form of a data link transmitter. The aircraft or vehicle periodically broadcasts its GPS-derived position and other information such as velocity over the data link, which is received by a ground-based transmitter/receiver (transceiver) for processing and display at an air traffic control facility.

(See GLOBAL POSITIONING SYSTEM.)

(See GROUND-BASED TRANSCEIVER.)

**AUTOMATIC DEPENDENT SURVEILLANCE–CONTRACT (ADS-C)**– A data link position reporting system, controlled by a ground station, that establishes contracts with an aircraft's avionics that occur automatically whenever specific events occur, or specific time intervals are reached.

**AUTOMATIC DEPENDENT SURVEILLANCE–REBROADCAST (ADS-R)**– A datalink translation function of the ADS-B ground system required to accommodate the two separate operating frequencies (978 MHz and 1090 MHz). The ADS-B system receives the ADS-B messages transmitted on one frequency and ADS-R translates and reformats the information for rebroadcast and use on the other frequency. This allows ADS-B In equipped aircraft to see nearby ADS-B Out traffic regardless of the operating link of the other aircraft. Aircraft operating on the same ADS-B frequency exchange information directly and do not require the ADS-R translation function.

**AUTOMATIC DIRECTION FINDER**– An aircraft radio navigation system which senses and indicates the direction to a L/MF nondirectional radio beacon (NDB) ground transmitter. Direction is indicated to the pilot as a magnetic bearing or as a relative bearing to the longitudinal axis of the aircraft depending on the type of indicator installed in the aircraft. In certain

applications, such as military, ADF operations may be based on airborne and ground transmitters in the VHF/UHF frequency spectrum.

(See BEARING.)

(See NONDIRECTIONAL BEACON.)

**AUTOMATIC FLIGHT INFORMATION SERVICE (AFIS) – ALASKA FSSs ONLY–** The continuous broadcast of recorded non-control information at airports in Alaska where a FSS provides local airport advisory service. The AFIS broadcast automates the repetitive transmission of essential but routine information such as weather, wind, altimeter, favored runway, braking action, airport NOTAMs, and other applicable information. The information is continuously broadcast over a discrete VHF radio frequency (usually the ASOS/AWSS/AWOS frequency).

**AUTOMATIC TERMINAL INFORMATION SERVICE–** The continuous broadcast of recorded noncontrol information in selected terminal areas. Its purpose is to improve controller effectiveness and to relieve frequency congestion by automating the repetitive transmission of essential but routine information; e.g., “Los Angeles information Alfa. One three zero zero Coordinated Universal Time. Weather, measured ceiling two thousand overcast, visibility three, haze, smoke, temperature seven one, dew point five seven, wind two five zero at five, altimeter two niner niner six. I-L-S Runway Two Five Left approach in use, Runway Two Five Right closed, advise you have Alfa.”

(See ICAO term AUTOMATIC TERMINAL INFORMATION SERVICE.)

(Refer to AIM.)

**AUTOMATIC TERMINAL INFORMATION SERVICE [ICAO]–** The provision of current, routine

information to arriving and departing aircraft by means of continuous and repetitive broadcasts throughout the day or a specified portion of the day.

**AUTOROTATION–** A rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion.

**a. Autorotative Landing/Touchdown Autorotation.** Used by a pilot to indicate that the landing will be made without applying power to the rotor.

**b. Low Level Autorotation.** Commences at an altitude well below the traffic pattern, usually below 100 feet AGL and is used primarily for tactical military training.

**c. 180 degrees Autorotation.** Initiated from a downwind heading and is commenced well inside the normal traffic pattern. “Go around” may not be possible during the latter part of this maneuver.

**AVAILABLE LANDING DISTANCE (ALD)–** The portion of a runway available for landing and roll-out for aircraft cleared for LAHSO. This distance is measured from the landing threshold to the hold-short point.

**AVIATION WEATHER SERVICE–** A service provided by the National Weather Service (NWS) and FAA which collects and disseminates pertinent weather information for pilots, aircraft operators, and ATC. Available aviation weather reports and forecasts are displayed at each NWS office and FAA FSS.

(See TRANSCRIBED WEATHER BROADCAST.)

(See WEATHER ADVISORY.)

(Refer to AIM.)

**AWW–**

(See SEVERE WEATHER FORECAST ALERTS.)



# B

**BACK-TAXI**– A term used by air traffic controllers to taxi an aircraft on the runway opposite to the traffic flow. The aircraft may be instructed to back-taxi to the beginning of the runway or at some point before reaching the runway end for the purpose of departure or to exit the runway.

**BASE LEG**–

(See **TRAFFIC PATTERN**.)

**BEACON**–

(See **AERONAUTICAL BEACON**.)

(See **AIRPORT ROTATING BEACON**.)

(See **AIRWAY BEACON**.)

(See **MARKER BEACON**.)

(See **NONDIRECTIONAL BEACON**.)

(See **RADAR**.)

**BEARING**– The horizontal direction to or from any point, usually measured clockwise from true north, magnetic north, or some other reference point through 360 degrees.

(See **NONDIRECTIONAL BEACON**.)

**BELOW MINIMUMS**– Weather conditions below the minimums prescribed by regulation for the particular action involved; e.g., landing minimums, takeoff minimums.

**BLAST FENCE**– A barrier that is used to divert or dissipate jet or propeller blast.

**BLAST PAD**– A surface adjacent to the ends of a runway provided to reduce the erosive effect of jet blast and propeller wash.

**BLIND SPEED**– The rate of departure or closing of a target relative to the radar antenna at which cancellation of the primary radar target by moving target indicator (MTI) circuits in the radar equipment causes a reduction or complete loss of signal.

(See **ICAO term BLIND VELOCITY**.)

**BLIND SPOT**– An area from which radio transmissions and/or radar echoes cannot be received. The term is also used to describe portions of the airport not visible from the control tower.

**BLIND TRANSMISSION**–

(See **TRANSMITTING IN THE BLIND**.)

**BLIND VELOCITY [ICAO]**– The radial velocity of a moving target such that the target is not seen on primary radars fitted with certain forms of fixed echo suppression.

**BLIND ZONE**–

(See **BLIND SPOT**.)

**BLOCKED**– Phraseology used to indicate that a radio transmission has been distorted or interrupted due to multiple simultaneous radio transmissions.

**BOTTOM ALTITUDE**– In reference to published altitude restrictions on a STAR or STAR runway transition, the lowest altitude authorized.

**BOUNDARY LIGHTS**–

(See **AIRPORT LIGHTING**.)

**BRAKING ACTION (GOOD, GOOD TO MEDIUM, MEDIUM, MEDIUM TO POOR, POOR, OR NIL)**– A report of conditions on the airport movement area providing a pilot with a degree/quality of braking to expect. Braking action is reported in terms of good, good to medium, medium, medium to poor, poor, or nil.

(See **RUNWAY CONDITION READING**.)

(See **RUNWAY CONDITION REPORT**.)

(See **RUNWAY CONDITION CODES**.)

**BRAKING ACTION ADVISORIES**– When tower controllers receive runway braking action reports which include the terms “medium,” “poor,” or “nil,” or whenever weather conditions are conducive to deteriorating or rapidly changing runway braking conditions, the tower will include on the ATIS broadcast the statement, “Braking Action Advisories are in Effect.” During the time braking action advisories are in effect, ATC will issue the most current braking action report for the runway in use to each arriving and departing aircraft. Pilots should be prepared for deteriorating braking conditions and should request current runway condition information if not issued by controllers. Pilots should also be prepared to provide a descriptive runway condition report to controllers after landing.

**BREAKOUT**– A technique to direct aircraft out of the approach stream. In the context of simultaneous (independent) parallel operations, a breakout is used to direct threatened aircraft away from a deviating aircraft.

**BROADCAST**– Transmission of information for which an acknowledgement is not expected.

(See ICAO term **BROADCAST**.)

**BROADCAST [ICAO]**– A transmission of information relating to air navigation that is not addressed to a specific station or stations.

**BUFFER AREA**– As applied to an MVA or MIA chart, a depicted three (3) or five (5) NM radius MVA/MIA sector isolating a displayed obstacle for which the sector is established. A portion of a buffer area can also be inclusive of a MVA/MIA sector polygon boundary.

# C

**CALCULATED LANDING TIME**– A term that may be used in place of tentative or actual calculated landing time, whichever applies.

**CALL FOR RELEASE**– Wherein the overlying ARTCC requires a terminal facility to initiate verbal coordination to secure ARTCC approval for release of a departure into the en route environment.

**CALL UP**– Initial voice contact between a facility and an aircraft, using the identification of the unit being called and the unit initiating the call.

(Refer to AIM.)

**CANADIAN MINIMUM NAVIGATION PERFORMANCE SPECIFICATION AIRSPACE**– That portion of Canadian domestic airspace within which MNPS separation may be applied.

**CARDINAL ALTITUDES**– “Odd” or “Even” thousand-foot altitudes or flight levels; e.g., 5,000, 6,000, 7,000, FL 250, FL 260, FL 270.

(See ALTITUDE.)

(See FLIGHT LEVEL.)

**CARDINAL FLIGHT LEVELS**–

(See CARDINAL ALTITUDES.)

**CAT**–

(See CLEAR-AIR TURBULENCE.)

**CATCH POINT**– A fix/waypoint that serves as a transition point from the high altitude waypoint navigation structure to an arrival procedure (STAR) or the low altitude ground-based navigation structure.

**CEILING**– The heights above the earth’s surface of the lowest layer of clouds or obscuring phenomena that is reported as “broken,” “overcast,” or “obscuration,” and not classified as “thin” or “partial.”

(See ICAO term CEILING.)

**CEILING [ICAO]**– The height above the ground or water of the base of the lowest layer of cloud below 6,000 meters (20,000 feet) covering more than half the sky.

**CENRAP**–

(See CENTER RADAR ARTS  
PRESENTATION/PROCESSING.)

**CENRAP-PLUS**–

(See CENTER RADAR ARTS  
PRESENTATION/PROCESSING-PLUS.)

**CENTER**–

(See AIR ROUTE TRAFFIC CONTROL  
CENTER.)

**CENTER’S AREA**– The specified airspace within which an air route traffic control center (ARTCC) provides air traffic control and advisory service.

(See AIR ROUTE TRAFFIC CONTROL  
CENTER.)

(Refer to AIM.)

**CENTER RADAR ARTS PRESENTATION/PROCESSING**– A computer program developed to provide a back-up system for airport surveillance radar in the event of a failure or malfunction. The program uses air route traffic control center radar for the processing and presentation of data on the ARTS IIA or IIIA displays.

**CENTER RADAR ARTS PRESENTATION/PROCESSING-PLUS**– A computer program developed to provide a back-up system for airport surveillance radar in the event of a terminal secondary radar system failure. The program uses a combination of Air Route Traffic Control Center Radar and terminal airport surveillance radar primary targets displayed simultaneously for the processing and presentation of data on the ARTS IIA or IIIA displays.

**CENTER TRACON AUTOMATION SYSTEM (CTAS)**– A computerized set of programs designed to aid Air Route Traffic Control Centers and TRACONs in the management and control of air traffic.

**CENTER WEATHER ADVISORY**– An unscheduled weather advisory issued by Center Weather Service Unit meteorologists for ATC use to alert pilots of existing or anticipated adverse weather conditions within the next 2 hours. A CWA may modify or redefine a SIGMET.

(See AWW.)

(See AIRMET.)

(See CONVECTIVE SIGMET.)

(See SIGMET.)

(Refer to AIM.)

**CENTRAL EAST PACIFIC**– An organized route system between the U.S. West Coast and Hawaii.

**CEP**–

(See **CENTRAL EAST PACIFIC**.)

**CERAP**–

(See **COMBINED CENTER-RAPCON**.)

**CERTIFIED TOWER RADAR DISPLAY (CTRD)**– An FAA radar display certified for use in the NAS.

**CFR**–

(See **CALL FOR RELEASE**.)

**CHAFF**– Thin, narrow metallic reflectors of various lengths and frequency responses, used to reflect radar energy. These reflectors, when dropped from aircraft and allowed to drift downward, result in large targets on the radar display.

**CHART SUPPLEMENT U.S.**– A publication designed primarily as a pilot's operational manual containing all airports, seaplane bases, and heliports open to the public including communications data, navigational facilities, and certain special notices and procedures. This publication is issued in seven volumes according to geographical area.

**CHARTED VFR FLYWAYS**– Charted VFR Flyways are flight paths recommended for use to bypass areas heavily traversed by large turbine-powered aircraft. Pilot compliance with recommended flyways and associated altitudes is strictly voluntary. VFR Flyway Planning charts are published on the back of existing VFR Terminal Area charts.

**CHARTED VISUAL FLIGHT PROCEDURE APPROACH**– An approach conducted while operating on an instrument flight rules (IFR) flight plan which authorizes the pilot of an aircraft to proceed visually and clear of clouds to the airport via visual landmarks and other information depicted on a charted visual flight procedure. This approach must be authorized and under the control of the appropriate air traffic control facility. Weather minimums required are depicted on the chart.

**CHASE**– An aircraft flown in proximity to another aircraft normally to observe its performance during training or testing.

**CHASE AIRCRAFT**–

(See **CHASE**.)

**CHOP**– A form of turbulence.

**a. Light Chop**– Turbulence that causes slight, rapid and somewhat rhythmic bumpiness without appreciable changes in altitude or attitude.

**b. Moderate Chop**– Turbulence similar to Light Chop but of greater intensity. It causes rapid bumps or jolts without appreciable changes in aircraft altitude or attitude.

(See **TURBULENCE**.)

**CIRCLE-TO-LAND MANEUVER**– A maneuver initiated by the pilot to align the aircraft with a runway for landing when a straight-in landing from an instrument approach is not possible or is not desirable. At tower controlled airports, this maneuver is made only after ATC authorization has been obtained and the pilot has established required visual reference to the airport.

(See **CIRCLE TO RUNWAY**.)

(See **LANDING MINIMUMS**.)

(Refer to **AIM**.)

**CIRCLE TO RUNWAY (RUNWAY NUMBER)**–

Used by ATC to inform the pilot that he/she must circle to land because the runway in use is other than the runway aligned with the instrument approach procedure. When the direction of the circling maneuver in relation to the airport/runway is required, the controller will state the direction (eight cardinal compass points) and specify a left or right downwind or base leg as appropriate; e.g., "Cleared VOR Runway Three Six Approach circle to Runway Two Two," or "Circle northwest of the airport for a right downwind to Runway Two Two."

(See **CIRCLE-TO-LAND MANEUVER**.)

(See **LANDING MINIMUMS**.)

(Refer to **AIM**.)

**CIRCLING APPROACH**–

(See **CIRCLE-TO-LAND MANEUVER**.)

**CIRCLING MANEUVER**–

(See **CIRCLE-TO-LAND MANEUVER**.)

**CIRCLING MINIMA**–

(See **LANDING MINIMUMS**.)

**CLASS A AIRSPACE**–

(See **CONTROLLED AIRSPACE**.)

**CLASS B AIRSPACE**–

(See **CONTROLLED AIRSPACE**.)

**CLASS C AIRSPACE**–

(See **CONTROLLED AIRSPACE**.)

**CLASS D AIRSPACE–**

(See CONTROLLED AIRSPACE.)

**CLASS E AIRSPACE–**

(See CONTROLLED AIRSPACE.)

**CLASS G AIRSPACE–** That airspace not designated as Class A, B, C, D or E.

**CLEAR AIR TURBULENCE (CAT)–** Turbulence encountered in air where no clouds are present. This term is commonly applied to high-level turbulence associated with wind shear. CAT is often encountered in the vicinity of the jet stream.

(See WIND SHEAR.)

(See JET STREAM.)

**CLEAR OF THE RUNWAY–**

**a.** Taxiing aircraft, which is approaching a runway, is clear of the runway when all parts of the aircraft are held short of the applicable runway holding position marking.

**b.** A pilot or controller may consider an aircraft, which is exiting or crossing a runway, to be clear of the runway when all parts of the aircraft are beyond the runway edge and there are no restrictions to its continued movement beyond the applicable runway holding position marking.

**c.** Pilots and controllers shall exercise good judgement to ensure that adequate separation exists between all aircraft on runways and taxiways at airports with inadequate runway edge lines or holding position markings.

**CLEARANCE–**

(See AIR TRAFFIC CLEARANCE.)

**CLEARANCE LIMIT–** The fix, point, or location to which an aircraft is cleared when issued an air traffic clearance.

(See ICAO term CLEARANCE LIMIT.)

**CLEARANCE LIMIT [ICAO]–** The point to which an aircraft is granted an air traffic control clearance.

**CLEARANCE VOID IF NOT OFF BY (TIME)–**

Used by ATC to advise an aircraft that the departure clearance is automatically canceled if takeoff is not made prior to a specified time. The pilot must obtain a new clearance or cancel his/her IFR flight plan if not off by the specified time.

(See ICAO term CLEARANCE VOID TIME.)

**CLEARANCE VOID TIME [ICAO]–** A time specified by an air traffic control unit at which a

clearance ceases to be valid unless the aircraft concerned has already taken action to comply therewith.

**CLEARED APPROACH–** ATC authorization for an aircraft to execute any standard or special instrument approach procedure for that airport. Normally, an aircraft will be cleared for a specific instrument approach procedure.

(See CLEARED (Type of) APPROACH.)

(See INSTRUMENT APPROACH PROCEDURE.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**CLEARED (Type of) APPROACH–** ATC authorization for an aircraft to execute a specific instrument approach procedure to an airport; e.g., “Cleared ILS Runway Three Six Approach.”

(See APPROACH CLEARANCE.)

(See INSTRUMENT APPROACH PROCEDURE.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**CLEARED AS FILED–** Means the aircraft is cleared to proceed in accordance with the route of flight filed in the flight plan. This clearance does not include the altitude, DP, or DP Transition.

(See REQUEST FULL ROUTE CLEARANCE.)

(Refer to AIM.)

**CLEARED FOR TAKEOFF–** ATC authorization for an aircraft to depart. It is predicated on known traffic and known physical airport conditions.

**CLEARED FOR THE OPTION–** ATC authorization for an aircraft to make a touch-and-go, low approach, missed approach, stop and go, or full stop landing at the discretion of the pilot. It is normally used in training so that an instructor can evaluate a student’s performance under changing situations. Pilots should advise ATC if they decide to remain on the runway, of any delay in their stop and go, delay clearing the runway, or are unable to comply with the instruction(s).

(See OPTION APPROACH.)

(Refer to AIM.)

**CLEARED THROUGH–** ATC authorization for an aircraft to make intermediate stops at specified airports without refiling a flight plan while en route to the clearance limit.

**CLEARED TO LAND**– ATC authorization for an aircraft to land. It is predicated on known traffic and known physical airport conditions.

**CLEARWAY**– An area beyond the takeoff runway under the control of airport authorities within which terrain or fixed obstacles may not extend above specified limits. These areas may be required for certain turbine-powered operations and the size and upward slope of the clearway will differ depending on when the aircraft was certificated.

(Refer to 14 CFR Part 1.)

**CLIMB TO VFR**– ATC authorization for an aircraft to climb to VFR conditions within Class B, C, D, and E surface areas when the only weather limitation is restricted visibility. The aircraft must remain clear of clouds while climbing to VFR.

(See SPECIAL VFR CONDITIONS.)

(Refer to AIM.)

**CLIMBOUT**– That portion of flight operation between takeoff and the initial cruising altitude.

**CLIMB VIA**– An abbreviated ATC clearance that requires compliance with the procedure lateral path, associated speed restrictions, and altitude restrictions along the cleared route or procedure.

**CLOSE PARALLEL RUNWAYS**– Two parallel runways whose extended centerlines are separated by less than 4,300 feet and at least 3000 feet (750 feet for SOIA operations) for which ATC is authorized to conduct simultaneous independent approach operations. PRM and simultaneous close parallel appear in approach title. Dual communications, special pilot training, an Attention All Users Page (AAUP), NTZ monitoring by displays that have aural and visual alerting algorithms are required. A high update rate surveillance sensor is required for certain runway or approach course spacing.

**CLOSED RUNWAY**– A runway that is unusable for aircraft operations. Only the airport management/military operations office can close a runway.

**CLOSED TRAFFIC**– Successive operations involving takeoffs and landings or low approaches where the aircraft does not exit the traffic pattern.

**CLOUD**– A cloud is a visible accumulation of minute water droplets and/or ice particles in the atmosphere above the Earth's surface. Cloud differs

from ground fog, fog, or ice fog only in that the latter are, by definition, in contact with the Earth's surface.

**CLT**–

(See CALCULATED LANDING TIME.)

**CLUTTER**– In radar operations, clutter refers to the reception and visual display of radar returns caused by precipitation, chaff, terrain, numerous aircraft targets, or other phenomena. Such returns may limit or preclude ATC from providing services based on radar.

(See CHAFF.)

(See GROUND CLUTTER.)

(See PRECIPITATION.)

(See TARGET.)

(See ICAO term RADAR CLUTTER.)

**CMNPS**–

(See CANADIAN MINIMUM NAVIGATION PERFORMANCE SPECIFICATION AIRSPACE.)

**COASTAL FIX**– A navigation aid or intersection where an aircraft transitions between the domestic route structure and the oceanic route structure.

**CODES**– The number assigned to a particular multiple pulse reply signal transmitted by a transponder.

(See DISCRETE CODE.)

**COLD TEMPERATURE COMPENSATION**– An action on the part of the pilot to adjust an aircraft's indicated altitude due to the effect of cold temperatures on true altitude above terrain versus aircraft indicated altitude. The amount of compensation required increases at a greater rate with a decrease in temperature and increase in height above the reporting station.

**COLLABORATIVE TRAJECTORY OPTIONS PROGRAM (CTOP)**– CTOP is a traffic management program administered by the Air Traffic Control System Command Center (ATCSCC) that manages demand through constrained airspace, while considering operator preference with regard to both route and delay as defined in a Trajectory Options Set (TOS).

**COMBINED CENTER-RAPCON**– An air traffic facility which combines the functions of an ARTCC and a radar approach control facility.

(See AIR ROUTE TRAFFIC CONTROL CENTER.)

(See RADAR APPROACH CONTROL FACILITY.)

**COMMON POINT**– A significant point over which two or more aircraft will report passing or have reported passing before proceeding on the same or diverging tracks. To establish/maintain longitudinal separation, a controller may determine a common point not originally in the aircraft's flight plan and then clear the aircraft to fly over the point.

(See **SIGNIFICANT POINT**.)

**COMMON PORTION**–

(See **COMMON ROUTE**.)

**COMMON ROUTE**– That segment of a North American Route between the inland navigation facility and the coastal fix.

## OR

**COMMON ROUTE**– Typically the portion of a RNAV STAR between the en route transition end point and the runway transition start point; however, the common route may only consist of a single point that joins the en route and runway transitions.

**COMMON TRAFFIC ADVISORY FREQUENCY (CTAF)**– A frequency designed for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower. The CTAF may be a UNICOM, Multicom, FSS, or tower frequency and is identified in appropriate aeronautical publications.

(See **DESIGNATED COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) AREA**.)

(Refer to AC 90-42, Traffic Advisory Practices at Airports Without Operating Control Towers.)

**COMPASS LOCATOR**– A low power, low or medium frequency (L/MF) radio beacon installed at the site of the outer or middle marker of an instrument landing system (ILS). It can be used for navigation at distances of approximately 15 miles or as authorized in the approach procedure.

**a. Outer Compass Locator (LOM)**– A compass locator installed at the site of the outer marker of an instrument landing system.

(See **OUTER MARKER**.)

**b. Middle Compass Locator (LMM)**– A compass locator installed at the site of the middle marker of an instrument landing system.

(See **MIDDLE MARKER**.)

(See ICAO term **LOCATOR**.)

**COMPASS ROSE**– A circle, graduated in degrees, printed on some charts or marked on the ground at an

airport. It is used as a reference to either true or magnetic direction.

**COMPLY WITH RESTRICTIONS**– An ATC instruction that requires an aircraft being vectored back onto an arrival or departure procedure to comply with all altitude and/or speed restrictions depicted on the procedure. This term may be used in lieu of repeating each remaining restriction that appears on the procedure.

**COMPOSITE FLIGHT PLAN**– A flight plan which specifies VFR operation for one portion of flight and IFR for another portion. It is used primarily in military operations.

(Refer to AIM.)

**COMPOSITE ROUTE SYSTEM**– An organized oceanic route structure, incorporating reduced lateral spacing between routes, in which composite separation is authorized.

**COMPOSITE SEPARATION**– 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.

**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 conflicts between aircraft that are radar identified and in communication with ATC by ensuring that radar targets do not touch. Pertinent traffic advisories shall be issued when this procedure is applied.

Note: This procedure shall not be provided utilizing mosaic radar systems.

**CONFORMANCE**– The condition established when an aircraft's actual position is within the conformance region constructed around that aircraft at its position, according to the trajectory associated with the aircraft's Current Plan.

**CONFORMANCE REGION**– A volume, bounded laterally, vertically, and longitudinally, within which an aircraft must be at a given time in order to be in conformance with the Current Plan Trajectory for that aircraft. At a given time, the conformance region is determined by the simultaneous application of the lateral, vertical, and longitudinal conformance bounds for the aircraft at the position defined by time and aircraft's trajectory.

**CONSOLAN**– A low frequency, long-distance NAVAIID used principally for transoceanic navigations.

**CONTACT**–

a. Establish communication with (followed by the name of the facility and, if appropriate, the frequency to be used).

b. A flight condition wherein the pilot ascertains the attitude of his/her aircraft and navigates by visual reference to the surface.

(See CONTACT APPROACH.)

(See RADAR CONTACT.)

**CONTACT APPROACH**– An approach wherein an aircraft on an IFR flight plan, having an air traffic control authorization, operating clear of clouds with at least 1 mile flight visibility and a reasonable expectation of continuing to the destination airport in those conditions, may deviate from the instrument approach procedure and proceed to the destination airport by visual reference to the surface. This approach will only be authorized when requested by

the pilot and the reported ground visibility at the destination airport is at least 1 statute mile.

(Refer to AIM.)

**CONTAMINATED RUNWAY**– A runway is considered contaminated whenever standing water, ice, snow, slush, frost in any form, heavy rubber, or other substances are present. A runway is contaminated with respect to rubber deposits or other friction-degrading substances when the average friction value for any 500-foot segment of the runway within the ALD fails below the recommended minimum friction level and the average friction value in the adjacent 500-foot segments falls below the maintenance planning friction level.

**CONTERMINOUS U.S.**– The 48 adjoining States and the District of Columbia.

**CONTINENTAL UNITED STATES**– The 49 States located on the continent of North America and the District of Columbia.

**CONTINUE**– When used as a control instruction should be followed by another word or words clarifying what is expected of the pilot. Example: "continue taxi," "continue descent," "continue inbound," etc.

**CONTROL AREA [ICAO]**– A controlled airspace extending upwards from a specified limit above the earth.

**CONTROL SECTOR**– An airspace area of defined horizontal and vertical dimensions for which a controller or group of controllers has air traffic control responsibility, normally within an air route traffic control center or an approach control facility. Sectors are established based on predominant traffic flows, altitude strata, and controller workload. Pilot communications during operations within a sector are normally maintained on discrete frequencies assigned to the sector.

(See DISCRETE FREQUENCY.)

**CONTROL SLASH**– A radar beacon slash representing the actual position of the associated aircraft. Normally, the control slash is the one closest to the interrogating radar beacon site. When ARTCC radar is operating in narrowband (digitized) mode, the control slash is converted to a target symbol.

**CONTROLLED AIRSPACE**– An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.



**a.** Controlled airspace is a generic term that covers Class A, Class B, Class C, Class D, and Class E airspace.

**b.** Controlled airspace is also that airspace within which all aircraft operators are subject to certain pilot qualifications, operating rules, and equipment requirements in 14 CFR Part 91 (for specific operating requirements, please refer to 14 CFR Part 91). For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive an appropriate ATC clearance. Each Class B, Class C, and Class D airspace area designated for an airport contains at least one primary airport around which the airspace is designated (for specific designations and descriptions of the airspace classes, please refer to 14 CFR Part 71).

**c.** Controlled airspace in the United States is designated as follows:

**1. CLASS A–** Generally, that airspace from 18,000 feet MSL up to and including FL 600, including the airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska. Unless otherwise authorized, all persons must operate their aircraft under IFR.

**2. CLASS B–** Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud clearance requirement for VFR operations is "clear of clouds."

**3. CLASS C–** Generally, that airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually tailored, the airspace usually consists of a surface area with a 5 nautical mile (NM) radius, a circle with a 10NM radius that extends no lower than 1,200 feet up to 4,000 feet above the

airport elevation, and an outer area that is not charted. Each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace.

(See OUTER AREA.)

**4. CLASS D–** Generally, that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and when instrument procedures are published, the airspace will normally be designed to contain the procedures. Arrival extensions for instrument approach procedures may be Class D or Class E airspace. Unless otherwise authorized, each person must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace. No separation services are provided to VFR aircraft.

**5. CLASS E–** Generally, if the airspace is not Class A, Class B, Class C, or Class D, and it is controlled airspace, it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Also in this class are Federal airways, airspace beginning at either 700 or 1,200 feet AGL used to transition to/from the terminal or en route environment, en route domestic, and offshore airspace areas designated below 18,000 feet MSL. Unless designated at a lower altitude, Class E airspace begins at 14,500 MSL over the United States, including that airspace overlying the waters within 12 nautical miles of the coast of the 48 contiguous States and Alaska, up to, but not including 18,000 feet MSL, and the airspace above FL 600.

**CONTROLLED AIRSPACE [ICAO]–** An airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification.

**Note:** Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D, and E.

**CONTROLLED TIME OF ARRIVAL–** Arrival time assigned during a Traffic Management Program. This

time may be modified due to adjustments or user options.

**CONTROLLER–**

(See AIR TRAFFIC CONTROL SPECIALIST.)

**CONTROLLER [ICAO]–** A person authorized to provide air traffic control services.

**CONTROLLER PILOT DATA LINK COMMUNICATIONS (CPDLC)–** A two-way digital communications system that conveys textual air traffic control messages between controllers and pilots using ground or satellite-based radio relay stations.

**CONVECTIVE SIGMET–** A weather advisory concerning convective weather significant to the safety of all aircraft. Convective SIGMETs are issued for tornadoes, lines of thunderstorms, embedded thunderstorms of any intensity level, areas of thunderstorms greater than or equal to VIP level 4 with an area coverage of  $\frac{4}{10}$  (40%) or more, and hail  $\frac{3}{4}$  inch or greater.

(See AIRMET.)

(See AWW.)

(See CWA.)

(See SIGMET.)

(Refer to AIM.)

**CONVECTIVE SIGNIFICANT METEOROLOGICAL INFORMATION–**

(See CONVECTIVE SIGMET.)

**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.)



# D

## D-ATIS-

(See DIGITAL-AUTOMATIC TERMINAL INFORMATION SERVICE.)

## D-ATIS [ICAO]-

(See ICAO Term DATA LINK AUTOMATIC TERMINAL INFORMATION SERVICE.)

## DA [ICAO]-

(See ICAO Term DECISION ALTITUDE/DECISION HEIGHT.)

## DAIR-

(See DIRECT ALTITUDE AND IDENTITY READOUT.)

**DANGER AREA [ICAO]-** An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Note: The term "Danger Area" is not used in reference to areas within the United States or any of its possessions or territories.

## DAS-

(See DELAY ASSIGNMENT.)

## DATA BLOCK-

(See ALPHANUMERIC DISPLAY.)

**DATA LINK AUTOMATIC TERMINAL INFORMATION SERVICE (D-ATIS) [ICAO]-** The provision of ATIS via data link.

**DEAD RECKONING-** Dead reckoning, as applied to flying, is the navigation of an airplane solely by means of computations based on airspeed, course, heading, wind direction, and speed, groundspeed, and elapsed time.

**DECISION ALTITUDE/DECISION HEIGHT [ICAO Annex 6]-** A specified altitude or height (A/H) in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

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

2. Category II and III minima are expressed as a DH and not a DA. Minima is assessed by reference to a radio altimeter and not a barometric altimeter, which makes the minima a DH.

3. The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path.

**DECISION ALTITUDE (DA)-** A specified altitude (mean sea level (MSL)) on an instrument approach procedure (ILS, GLS, vertically guided RNAV) at which the pilot must decide whether to continue the approach or initiate an immediate missed approach if the pilot does not see the required visual references.

**DECISION HEIGHT (DH)-** With respect to the operation of aircraft, means the height at which a decision must be made during an ILS or PAR instrument approach to either continue the approach or to execute a missed approach.

(See ICAO term DECISION ALTITUDE/DECISION HEIGHT.)

**DECODER-** The device used to decipher signals received from ATCRBS transponders to effect their display as select codes.

(See CODES.)

(See RADAR.)

**DEFENSE AREA-** Any airspace of the contiguous United States that is not an ADIZ in which the control of aircraft is required for reasons of national security.

**DEFENSE VISUAL FLIGHT RULES-** Rules applicable to flights within an ADIZ conducted under the visual flight rules in 14 CFR Part 91.

(See AIR DEFENSE IDENTIFICATION ZONE.)

(Refer to 14 CFR Part 91.)

(Refer to 14 CFR Part 99.)

**DELAY ASSIGNMENT (DAS)-** Delays are distributed to aircraft based on the traffic management program parameters. The delay assignment is calculated in 15-minute increments and appears as a table in Traffic Flow Management System (TFMS).

***DELAY INDEFINITE (REASON IF KNOWN) EXPECT FURTHER CLEARANCE (TIME)-***

Used by ATC to inform a pilot when an accurate estimate of the delay time and the reason for the delay cannot immediately be determined; e.g., a disabled

aircraft on the runway, terminal or center area saturation, weather below landing minimums, etc.

(See EXPECT FURTHER CLEARANCE (TIME).)

**DELAY TIME**– The amount of time that the arrival must lose to cross the meter fix at the assigned meter fix time. This is the difference between ACLT and VTA.

**DEPARTURE CENTER**– The ARTCC having jurisdiction for the airspace that generates a flight to the impacted airport.

**DEPARTURE CONTROL**– A function of an approach control facility providing air traffic control service for departing IFR and, under certain conditions, VFR aircraft.

(See APPROACH CONTROL FACILITY.)

(Refer to AIM.)

**DEPARTURE SEQUENCING PROGRAM**– A program designed to assist in achieving a specified interval over a common point for departures.

**DEPARTURE TIME**– The time an aircraft becomes airborne.

**DESCEND VIA**– An abbreviated ATC clearance that requires compliance with a published procedure lateral path and associated speed restrictions and provides a pilot-discretion descent to comply with published altitude restrictions.

**DESCENT SPEED ADJUSTMENTS**– Speed deceleration calculations made to determine an accurate VTA. These calculations start at the transition point and use arrival speed segments to the vertex.

**DESIGNATED COMMON TRAFFIC ADVISORY FREQUENCY (CTAF) AREA**– In Alaska, in addition to being designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating airport traffic control tower, a CTAF may also be designated for the purpose of carrying out advisory practices for operations in and through areas with a high volume of VFR traffic.

**DESIRED COURSE**–

**a. True**– A predetermined desired course direction to be followed (measured in degrees from true north).

**b. Magnetic**– A predetermined desired course direction to be followed (measured in degrees from local magnetic north).

**DESIRED TRACK**– The planned or intended track between two waypoints. It is measured in degrees from either magnetic or true north. The instantaneous angle may change from point to point along the great circle track between waypoints.

**DETRESFA (DISTRESS PHASE) [ICAO]**– The code word used to designate an emergency phase wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

**DEVIATIONS**–

**a.** A departure from a current clearance, such as an off course maneuver to avoid weather or turbulence.

**b.** Where specifically authorized in the CFRs and requested by the pilot, ATC may permit pilots to deviate from certain regulations.

**DH**–

(See DECISION HEIGHT.)

**DH [ICAO]**–

(See ICAO Term DECISION ALTITUDE/  
DECISION HEIGHT.)

**DIGITAL-AUTOMATIC TERMINAL INFORMATION SERVICE (D-ATIS)**– The service provides text messages to aircraft, airlines, and other users outside the standard reception range of conventional ATIS via landline and data link communications to the cockpit. Also, the service provides a computer-synthesized voice message that can be transmitted to all aircraft within range of existing transmitters. The Terminal Data Link System (TDLS) D-ATIS application uses weather inputs from local automated weather sources or manually entered meteorological data together with preprogrammed menus to provide standard information to users. Airports with D-ATIS capability are listed in the Chart Supplement U.S.

**DIGITAL TARGET**– A computer-generated symbol representing an aircraft's position, based on a primary return or radar beacon reply, shown on a digital display.

**DIGITAL TERMINAL AUTOMATION SYSTEM (DTAS)**– A system where digital radar and beacon data is presented on digital displays and the operational program monitors the system performance on a real-time basis.

**DIGITIZED TARGET**– A computer-generated indication shown on an analog radar display resulting from a primary radar return or a radar beacon reply.

**DIRECT**– Straight line flight between two navigational aids, fixes, points, or any combination thereof. When used by pilots in describing off-airway routes, points defining direct route segments become compulsory reporting points unless the aircraft is under radar contact.

**DIRECTLY BEHIND**– An aircraft is considered to be operating directly behind when it is following the actual flight path of the lead aircraft over the surface of the earth except when applying wake turbulence separation criteria.

**DISCRETE BEACON CODE**–

(See DISCRETE CODE.)

**DISCRETE CODE**– As used in the Air Traffic Control Radar Beacon System (ATCRBS), any one of the 4096 selectable Mode 3/A aircraft transponder codes except those ending in zero zero; e.g., discrete codes: 0010, 1201, 2317, 7777; nondiscrete codes: 0100, 1200, 7700. Nondiscrete codes are normally reserved for radar facilities that are not equipped with discrete decoding capability and for other purposes such as emergencies (7700), VFR aircraft (1200), etc.

(See RADAR.)

(Refer to AIM.)

**DISCRETE FREQUENCY**– A separate radio frequency for use in direct pilot-controller communications in air traffic control which reduces frequency congestion by controlling the number of aircraft operating on a particular frequency at one time. Discrete frequencies are normally designated for each control sector in en route/terminal ATC facilities. Discrete frequencies are listed in the Chart Supplement U.S. and the DOD FLIP IFR En Route Supplement.

(See CONTROL SECTOR.)

**DISPLACED THRESHOLD**– A threshold that is located at a point on the runway other than the designated beginning of the runway.

(See THRESHOLD.)

(Refer to AIM.)

**DISTANCE MEASURING EQUIPMENT (DME)**– Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

(See TACAN.)

(See VORTAC.)

**DISTRESS**– A condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.

**DIVE BRAKES**–

(See SPEED BRAKES.)

**DIVERSE VECTOR AREA**– In a radar environment, that area in which a prescribed departure route is not required as the only suitable route to avoid obstacles. The area in which random radar vectors below the MVA/MIA, established in accordance with the TERPS criteria for diverse departures, obstacles and terrain avoidance, may be issued to departing aircraft.

**DIVERSION (DVRN)**– Flights that are required to land at other than their original destination for reasons beyond the control of the pilot/company, e.g. periods of significant weather.

**DME**–

(See DISTANCE MEASURING EQUIPMENT.)

**DME FIX**– A geographical position determined by reference to a navigational aid which provides distance and azimuth information. It is defined by a specific distance in nautical miles and a radial, azimuth, or course (i.e., localizer) in degrees magnetic from that aid.

(See DISTANCE MEASURING EQUIPMENT.)

(See FIX.)

**DME SEPARATION**– Spacing of aircraft in terms of distances (nautical miles) determined by reference to distance measuring equipment (DME).

(See DISTANCE MEASURING EQUIPMENT.)

**DOD FLIP**– Department of Defense Flight Information Publications used for flight planning, en route, and terminal operations. FLIP is produced by the National Geospatial-Intelligence Agency (NGA) for world-wide use. United States Government Flight Information Publications (en route charts and instrument approach procedure charts) are incorporated in DOD FLIP for use in the National Airspace System (NAS).

**DOMESTIC AIRSPACE**– Airspace which overlies the continental land mass of the United States plus Hawaii and U.S. possessions. Domestic airspace extends to 12 miles offshore.

**DOWNBURST**– A strong downdraft which induces an outburst of damaging winds on or near the ground. Damaging winds, either straight or curved, are highly

divergent. The sizes of downbursts vary from 1/2 mile or less to more than 10 miles. An intense downburst often causes widespread damage. Damaging winds, lasting 5 to 30 minutes, could reach speeds as high as 120 knots.

**DOWNWIND LEG–**

(See **TRAFFIC PATTERN.**)

**DP–**

(See **INSTRUMENT DEPARTURE PROCEDURE.**)

**DRAG CHUTE–** A parachute device installed on certain aircraft which is deployed on landing roll to assist in deceleration of the aircraft.

**DROP ZONE–** Any pre-determined area upon which parachutists or objects land after making an intentional parachute jump or drop.

(Refer to 14 CFR §105.3, Definitions)

**DSP–**

(See **DEPARTURE SEQUENCING PROGRAM.**)

**DT–**

(See **DELAY TIME.**)

**DTAS–**

(See **DIGITAL TERMINAL AUTOMATION SYSTEM.**)

**DUE REGARD–** A phase of flight wherein an aircraft commander of a State-operated aircraft

assumes responsibility to separate his/her aircraft from all other aircraft.

(See also FAA Order JO 7110.65, Para 1–2–1, **WORD MEANINGS.**)

**DUTY RUNWAY–**

(See **RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY.**)

**DVA–**

(See **DIVERSE VECTOR AREA.**)

**DVFR–**

(See **DEFENSE VISUAL FLIGHT RULES.**)

**DVFR FLIGHT PLAN–** A flight plan filed for a VFR aircraft which intends to operate in airspace within which the ready identification, location, and control of aircraft are required in the interest of national security.

**DVRSN–**

(See **DIVERSION.**)

**DYNAMIC–** Continuous review, evaluation, and change to meet demands.

**DYNAMIC RESTRICTIONS–** Those restrictions imposed by the local facility on an “as needed” basis to manage unpredictable fluctuations in traffic demands.



# E

## EAS–

(See EN ROUTE AUTOMATION SYSTEM.)

## EDCT–

(See EXPECT DEPARTURE CLEARANCE TIME.)

## EDST–

(See EN ROUTE DECISION SUPPORT TOOL)

## EFC–

(See EXPECT FURTHER CLEARANCE (TIME).)

## ELT–

(See EMERGENCY LOCATOR TRANSMITTER.)

**EMERGENCY**– A distress or an urgency condition.

**EMERGENCY 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.

**ESTIMATED (EST)–**When used in NOTAMs “EST” is a contraction that is used by the issuing authority only when the condition is expected to return to service prior to the expiration time. Using “EST” lets the user know that this NOTAM has the possibility of returning to service earlier than the expiration time. Any NOTAM which includes an “EST” will be auto-expired at the designated expiration time.

**ESTIMATED ELAPSED TIME [ICAO]–** The estimated time required to proceed from one significant point to another.

(See ICAO Term TOTAL ESTIMATED ELAPSED TIME.)

**ESTIMATED OFF-BLOCK TIME [ICAO]–** The estimated time at which the aircraft will commence movement associated with departure.

**ESTIMATED POSITION ERROR (EPE)–**

(See Required Navigation Performance)

**ESTIMATED TIME OF ARRIVAL–** The time the flight is estimated to arrive at the gate (scheduled operators) or the actual runway on times for nonscheduled operators.

**ESTIMATED TIME EN ROUTE–** The estimated flying time from departure point to destination (lift-off to touchdown).

**ETA–**

(See ESTIMATED TIME OF ARRIVAL.)

**ETE–**

(See ESTIMATED TIME EN ROUTE.)

**EXECUTE MISSED APPROACH–** Instructions issued to a pilot making an instrument approach which means continue inbound to the missed approach point and execute the missed approach procedure as described on the Instrument Approach Procedure Chart or as previously assigned by ATC. The pilot may climb immediately to the altitude specified in the missed approach procedure upon making a missed approach. No turns should be initiated prior to reaching the missed approach point. When conducting an ASR or PAR approach, execute the assigned missed approach procedure immediately upon receiving instructions to “execute missed approach.”

(Refer to AIM.)

**EXPECT (ALTITUDE) AT (TIME) or (FIX)–** Used under certain conditions to provide a pilot with an altitude to be used in the event of two-way communications failure. It also provides altitude information to assist the pilot in planning.

(Refer to AIM.)

**EXPECT DEPARTURE CLEARANCE TIME (EDCT)–** The runway release time assigned to an aircraft in a traffic management program and shown on the flight progress strip as an EDCT.

(See GROUND DELAY PROGRAM.)

**EXPECT FURTHER CLEARANCE (TIME)–** The time a pilot can expect to receive clearance beyond a clearance limit.

**EXPECT FURTHER CLEARANCE VIA (AIRWAYS, ROUTES OR FIXES)–** Used to inform a pilot of the routing he/she can expect if any part of the route beyond a short range clearance limit differs from that filed.

**EXPEDITE–** Used by ATC when prompt compliance is required to avoid the development of an imminent situation. Expedite climb/descent normally indicates to a pilot that the approximate best rate of climb/descent should be used without requiring an exceptional change in aircraft handling characteristics.

# F

## FAF–

(See FINAL APPROACH FIX.)

**FALLEN HERO**– Remains of fallen members of the United States military are often returned home by aircraft. These flights may be identified with the phrase “FALLEN HERO” added to the remarks section of the flight plan, or they may be transmitted via air/ground communications. If able, these flights will receive priority handling.

**FAST FILE**– An FSS system whereby a pilot files a flight plan via telephone that is recorded and later transcribed for transmission to the appropriate air traffic facility. (Alaska only.)

**FAWP**– Final Approach Waypoint

## FCLT–

(See FREEZE CALCULATED LANDING TIME.)

**FEATHERED PROPELLER**– A propeller whose blades have been rotated so that the leading and trailing edges are nearly parallel with the aircraft flight path to stop or minimize drag and engine rotation. Normally used to indicate shutdown of a reciprocating or turboprop engine due to malfunction.

## FEDERAL AIRWAYS–

(See LOW ALTITUDE AIRWAY STRUCTURE.)

**FEEDER FIX**– The fix depicted on Instrument Approach Procedure Charts which establishes the starting point of the feeder route.

**FEEDER ROUTE**– A route depicted on instrument approach procedure charts to designate routes for aircraft to proceed from the en route structure to the initial approach fix (IAF).

(See INSTRUMENT APPROACH PROCEDURE.)

**FERRY FLIGHT**– A flight for the purpose of:

- a. Returning an aircraft to base.
- b. Delivering an aircraft from one location to another.
- c. Moving an aircraft to and from a maintenance base. Ferry flights, under certain conditions, may be conducted under terms of a special flight permit.

## FIELD ELEVATION–

(See AIRPORT ELEVATION.)

**FILED**– Normally used in conjunction with flight plans, meaning a flight plan has been submitted to ATC.

**FILED EN ROUTE DELAY**– Any of the following preplanned delays at points/areas along the route of flight which require special flight plan filing and handling techniques.

a. Terminal Area Delay. A delay within a terminal area for touch-and-go, low approach, or other terminal area activity.

b. Special Use Airspace Delay. A delay within a Military Operations Area, Restricted Area, Warning Area, or ATC Assigned Airspace.

c. Aerial Refueling Delay. A delay within an Aerial Refueling Track or Anchor.

**FILED FLIGHT PLAN**– The flight plan as filed with an ATS unit by the pilot or his/her designated representative without any subsequent changes or clearances.

**FINAL**– Commonly used to mean that an aircraft is on the final approach course or is aligned with a landing area.

(See FINAL APPROACH COURSE.)

(See FINAL APPROACH-IFR.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**FINAL APPROACH [ICAO]**– That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified.

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

b. At the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:

1. A landing can be made; or
2. A missed approach procedure is initiated.

**FINAL APPROACH COURSE**– A bearing/radial/track of an instrument approach leading to a runway or an extended runway centerline all without regard to distance.

**FINAL APPROACH FIX**– The fix from which the final approach (IFR) to an airport is executed and which identifies the beginning of the final approach segment. It is designated on Government charts by the Maltese Cross symbol for nonprecision approaches and the lightning bolt symbol, designating the PFAF, for precision approaches; or when ATC directs a lower-than-published glideslope/path or vertical path intercept altitude, it is the resultant actual point of the glideslope/path or vertical path intercept.

(See FINAL APPROACH POINT.)

(See GLIDESLOPE INTERCEPT ALTITUDE.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**FINAL APPROACH-IFR**– The flight path of an aircraft which is inbound to an airport on a final instrument approach course, beginning at the final approach fix or point and extending to the airport or the point where a circle-to-land maneuver or a missed approach is executed.

(See FINAL APPROACH COURSE.)

(See FINAL APPROACH FIX.)

(See FINAL APPROACH POINT.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

(See ICAO term FINAL APPROACH.)

**FINAL APPROACH POINT**– The point, applicable only to a nonprecision approach with no depicted FAF (such as an on airport VOR), where the aircraft is established inbound on the final approach course from the procedure turn and where the final approach descent may be commenced. The FAP serves as the FAF and identifies the beginning of the final approach segment.

(See FINAL APPROACH FIX.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**FINAL APPROACH SEGMENT**–

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**FINAL APPROACH SEGMENT [ICAO]**– That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

**FINAL CONTROLLER**– The controller providing information and final approach guidance during PAR and ASR approaches utilizing radar equipment.

(See RADAR APPROACH.)

**FINAL GUARD SERVICE**– A value added service provided in conjunction with LAA/RAA only during periods of significant and fast changing weather conditions that may affect landing and takeoff operations.

**FINAL MONITOR AID**– A high resolution color display that is equipped with the controller alert system hardware/software used to monitor the no transgression zone (NTZ) during simultaneous parallel approach operations. The display includes alert algorithms providing the target predictors, a color change alert when a target penetrates or is predicted to penetrate the no transgression zone (NTZ), synthesized voice alerts, and digital mapping.

(See RADAR APPROACH.)

**FINAL MONITOR CONTROLLER**– Air Traffic Control Specialist assigned to radar monitor the flight path of aircraft during simultaneous parallel (approach courses spaced less than 9000 feet/9200 feet above 5000 feet) and simultaneous close parallel approach operations. Each runway is assigned a final monitor controller during simultaneous parallel and simultaneous close parallel ILS approaches.

**FIR**–

(See FLIGHT INFORMATION REGION.)

**FIRST TIER CENTER**– An ARTCC immediately adjacent to the impacted center.

**FIS-B**–

(See FLIGHT INFORMATION SERVICE-BROADCAST.)

**FIX**– A geographical position determined by visual reference to the surface, by reference to one or more radio NAVAIDs, by celestial plotting, or by another navigational device.

**FIX BALANCING**– A process whereby aircraft are evenly distributed over several available arrival fixes reducing delays and controller workload.

**FLAG**– A warning device incorporated in certain airborne navigation and flight instruments indicating that:

a. Instruments are inoperative or otherwise not operating satisfactorily, or

**b.** Signal strength or quality of the received signal falls below acceptable values.

**FLAG ALARM–**

(See FLAG.)

**FLAMEOUT–** An emergency condition caused by a loss of engine power.

**FLAMEOUT PATTERN–** An approach normally conducted by a single-engine military aircraft experiencing loss or anticipating loss of engine power or control. The standard overhead approach starts at a relatively high altitude over a runway (“high key”) followed by a continuous 180 degree turn to a high, wide position (“low key”) followed by a continuous 180 degree turn final. The standard straight-in pattern starts at a point that results in a straight-in approach with a high rate of descent to the runway. Flameout approaches terminate in the type approach requested by the pilot (normally fullstop).

**FLIGHT CHECK–** A call sign prefix used by FAA aircraft engaged in flight inspection/certification of navigational aids and flight procedures. The word “recorded” may be added as a suffix; e.g., “Flight Check 320 recorded” to indicate that an automated flight inspection is in progress in terminal areas.

(See FLIGHT INSPECTION.)

(Refer to AIM.)

**FLIGHT FOLLOWING–**

(See TRAFFIC ADVISORIES.)

**FLIGHT INFORMATION REGION–** An airspace of defined dimensions within which Flight Information Service and Alerting Service are provided.

**a.** Flight Information Service. A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

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

**FLIGHT INFORMATION SERVICE–** A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

**FLIGHT INFORMATION SERVICE– BROADCAST (FIS-B)–** A ground broadcast service provided through the ADS-B Broadcast Services

network over the UAT data link that operates on 978 MHz. The FIS-B system provides pilots and flight crews of properly equipped aircraft with a cockpit display of certain aviation weather and aeronautical information.

**FLIGHT INSPECTION–** Inflight investigation and evaluation of a navigational aid to determine whether it meets established tolerances.

(See FLIGHT CHECK.)

(See NAVIGATIONAL AID.)

**FLIGHT LEVEL–** A level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits that represent hundreds of feet. For example, flight level (FL) 250 represents a barometric altimeter indication of 25,000 feet; FL 255, an indication of 25,500 feet.

(See ICAO term FLIGHT LEVEL.)

**FLIGHT LEVEL [ICAO]–** A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 hPa (1013.2 mb), and is separated from other such surfaces by specific pressure intervals.

Note 1: A pressure type altimeter calibrated in accordance with the standard atmosphere:

- a.** When set to a QNH altimeter setting, will indicate altitude;
- b.** When set to a QFE altimeter setting, will indicate height above the QFE reference datum; and
- c.** When set to a pressure of 1013.2 hPa (1013.2 mb), may be used to indicate flight levels.

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

**FLIGHT LINE–** A term used to describe the precise movement of a civil photogrammetric aircraft along a predetermined course(s) at a predetermined altitude during the actual photographic run.

**FLIGHT MANAGEMENT SYSTEMS–** A computer system that uses a large data base to allow routes to be preprogrammed and fed into the system by means of a data loader. The system is constantly updated with respect to position accuracy by reference to conventional navigation aids. The sophisticated program and its associated data base ensures that the most appropriate aids are automatically selected during the information update cycle.

**FLIGHT PATH**– A line, course, or track along which an aircraft is flying or intended to be flown.

(See **COURSE**.)

(See **TRACK**.)

**FLIGHT PLAN**– Specified information relating to the intended flight of an aircraft that is filed orally or in writing with an FSS or an ATC facility.

(See **FAST FILE**.)

(See **FILED**.)

(Refer to **AIM**.)

**FLIGHT PLAN AREA (FPA)**– The geographical area assigned to a flight service station (FSS) for the purpose of establishing primary responsibility for services that may include search and rescue for VFR aircraft, issuance of NOTAMS, pilot briefings, inflight services, broadcast services, emergency services, flight data processing, international operations, and aviation weather services. Large consolidated FSS facilities may combine FPAs into larger areas of responsibility (AOR).

(See **FLIGHT SERVICE STATION**.)

(See **TIE-IN FACILITY**.)

**FLIGHT RECORDER**– A general term applied to any instrument or device that records information about the performance of an aircraft in flight or about conditions encountered in flight. Flight recorders may make records of airspeed, outside air temperature, vertical acceleration, engine RPM, manifold pressure, and other pertinent variables for a given flight.

(See ICAO term **FLIGHT RECORDER**.)

**FLIGHT RECORDER [ICAO]**– Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Note: See Annex 6 Part I, for specifications relating to flight recorders.

**FLIGHT SERVICE STATION (FSS)**– An air traffic facility which provides pilot briefings, flight plan processing, en route flight advisories, search and rescue services, and assistance to lost aircraft and aircraft in emergency situations. FSS also relay ATC clearances, process Notices to Airmen, broadcast aviation weather and aeronautical information, and advise Customs and Immigration of transborder flights. In Alaska, FSS provide Airport Advisory Services.

(See **FLIGHT PLAN AREA**.)

(See **TIE-IN FACILITY**.)

**FLIGHT STANDARDS DISTRICT OFFICE**– An FAA field office serving an assigned geographical area and staffed with Flight Standards personnel who serve the aviation industry and the general public on matters relating to the certification and operation of air carrier and general aviation aircraft. Activities include general surveillance of operational safety, certification of airmen and aircraft, accident prevention, investigation, enforcement, etc.

**FLIGHT TERMINATION**– The intentional and deliberate process of terminating the flight of a UA in the event of an unrecoverable lost link, loss of control, or other failure that compromises the safety of flight.

**FLIGHT TEST**– A flight for the purpose of:

a. Investigating the operation/flight characteristics of an aircraft or aircraft component.

b. Evaluating an applicant for a pilot certificate or rating.

**FLIGHT VISIBILITY**–

(See **VISIBILITY**.)

**FLIP**–

(See **DOD FLIP**.)

**FLY HEADING (DEGREES)**– Informs the pilot of the heading he/she should fly. The pilot may have to turn to, or continue on, a specific compass direction in order to comply with the instructions. The pilot is expected to turn in the shorter direction to the heading unless otherwise instructed by ATC.

**FLY-BY WAYPOINT**– A fly-by waypoint requires the use of turn anticipation to avoid overshoot of the next flight segment.

**FLY-OVER WAYPOINT**– A fly-over waypoint precludes any turn until the waypoint is overflown and is followed by an intercept maneuver of the next flight segment.

**FLY VISUAL TO AIRPORT**–

(See **PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT**.)

**FMA**–

(See **FINAL MONITOR AID**.)

**FMS**–

(See **FLIGHT MANAGEMENT SYSTEM**.)

**FORMATION FLIGHT**– More than one aircraft which, by prior arrangement between the pilots, operate as a single aircraft with regard to navigation

and position reporting. Separation between aircraft within the formation is the responsibility of the flight leader and the pilots of the other aircraft in the flight. This includes transition periods when aircraft within the formation are maneuvering to attain separation from each other to effect individual control and during join-up and breakaway.

**a.** A standard formation is one in which a proximity of no more than 1 mile laterally or longitudinally and within 100 feet vertically from the flight leader is maintained by each wingman.

**b.** Nonstandard formations are those operating under any of the following conditions:

**1.** When the flight leader has requested and ATC has approved other than standard formation dimensions.

**2.** When operating within an authorized altitude reservation (ALTRV) or under the provisions of a letter of agreement.

**3.** When the operations are conducted in airspace specifically designed for a special activity.  
(See ALTITUDE RESERVATION.)  
(Refer to 14 CFR Part 91.)

#### ***FRC***–

(See REQUEST FULL ROUTE CLEARANCE.)

**FREEZE/FROZEN**– Terms used in referring to arrivals which have been assigned ACLTs and to the lists in which they are displayed.

**FREEZE CALCULATED LANDING TIME**– A dynamic parameter number of minutes prior to the meter fix calculated time of arrival for each aircraft when the TCLT is frozen and becomes an ACLT (i.e., the VTA is updated and consequently the TCLT is modified as appropriate until FCLT minutes prior to meter fix calculated time of arrival, at which time updating is suspended and an ACLT and a frozen meter fix crossing time (MFT) is assigned).

**FREEZE HORIZON**– The time or point at which an aircraft's STA becomes fixed and no longer fluctuates with each radar update. This setting ensures a constant time for each aircraft, necessary for the metering controller to plan his/her delay technique. This setting can be either in distance from the meter fix or a prescribed flying time to the meter fix.

**FREEZE SPEED PARAMETER**– A speed adapted for each aircraft to determine fast and slow aircraft.

Fast aircraft freeze on parameter FCLT and slow aircraft freeze on parameter MLDI.

**FRICTION MEASUREMENT**– A measurement of the friction characteristics of the runway pavement surface using continuous self-watering friction measurement equipment in accordance with the specifications, procedures and schedules contained in AC 150/5320–12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces.

#### **FSDO**–

(See FLIGHT STANDARDS DISTRICT OFFICE.)

#### **FSPD**–

(See FREEZE SPEED PARAMETER.)

#### **FSS**–

(See FLIGHT SERVICE STATION.)

**FUEL DUMPING**– Airborne release of usable fuel. This does not include the dropping of fuel tanks.

(See JETTISONING OF EXTERNAL STORES.)

**FUEL REMAINING**– A phrase used by either pilots or controllers when relating to the fuel remaining on board until actual fuel exhaustion. When transmitting such information in response to either a controller question or pilot initiated cautionary advisory to air traffic control, pilots will state the APPROXIMATE NUMBER OF MINUTES the flight can continue with the fuel remaining. All reserve fuel SHOULD BE INCLUDED in the time stated, as should an allowance for established fuel gauge system error.

**FUEL SIPHONING**– Unintentional release of fuel caused by overflow, puncture, loose cap, etc.

#### **FUEL VENTING**–

(See FUEL SIPHONING.)

#### **FUSED TARGET**–

(See DIGITAL TARGET)

**FUSION [STARS/CARTS]**– the combination of all available surveillance sources (airport surveillance radar [ASR], air route surveillance radar [ARSR], ADS-B, etc.) into the display of a single tracked target for air traffic control separation services. FUSION is the equivalent of the current single-sensor radar display. FUSION performance is characteristic of a single-sensor radar display system. Terminal areas use mono-pulse secondary surveillance radar (ASR 9, Mode S or ASR 11, MSSR).





# G

**GATE HOLD PROCEDURES**– Procedures at selected airports to hold aircraft at the gate or other ground location whenever departure delays exceed or are anticipated to exceed 15 minutes. The sequence for departure will be maintained in accordance with initial call-up unless modified by flow control restrictions. Pilots should monitor the ground control/clearance delivery frequency for engine start/taxi advisories or new proposed start/taxi time if the delay changes.

**GBT**–

(See **GROUND-BASED TRANSCEIVER**.)

**GCA**–

(See **GROUND CONTROLLED APPROACH**.)

**GDP**–

(See **GROUND DELAY PROGRAM**.)

**GENERAL AVIATION**– That portion of civil aviation that does not include scheduled or unscheduled air carriers or commercial space operations.

(See ICAO term **GENERAL AVIATION**.)

**GENERAL AVIATION [ICAO]**– All civil aviation operations other than scheduled air services and nonscheduled air transport operations for remuneration or hire.

**GEO MAP**– The digitized map markings associated with the ASR-9 Radar System.

**GLIDEPATH**–

(See **GLIDESLOPE**.)

**GLIDEPATH [ICAO]**– A descent profile determined for vertical guidance during a final approach.

**GLIDEPATH INTERCEPT ALTITUDE**–

(See **GLIDESLOPE INTERCEPT ALTITUDE**.)

**GLIDESLOPE**– Provides vertical guidance for aircraft during approach and landing. The glideslope/glidepath is based on the following:

**a.** Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or,

**b.** Visual ground aids, such as VASI, which provide vertical guidance for a VFR approach or for the visual portion of an instrument approach and landing.

**c.** **PAR**. Used by ATC to inform an aircraft making a PAR approach of its vertical position (elevation) relative to the descent profile.

(See ICAO term **GLIDEPATH**.)

**GLIDESLOPE INTERCEPT ALTITUDE**– The published minimum altitude to intercept the glideslope in the intermediate segment of an instrument approach. Government charts use the lightning bolt symbol to identify this intercept point. This intersection is called the Precise Final Approach fix (PFAF). ATC directs a higher altitude, the resultant intercept becomes the PFAF.

(See **FINAL APPROACH FIX**.)

(See **SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE**.)

**GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) [ICAO]**– GNSS refers collectively to the worldwide positioning, navigation, and timing determination capability available from one or more satellite constellation in conjunction with a network of ground stations.

**GLOBAL NAVIGATION SATELLITE SYSTEM MINIMUM EN ROUTE IFR ALTITUDE (GNSS MEA)**– The minimum en route IFR altitude on a published ATS route or route segment which assures acceptable Global Navigation Satellite System reception and meets obstacle clearance requirements. (Refer to 14 CFR Part 91.) (Refer to 14 CFR Part 95.)

**GLOBAL POSITIONING SYSTEM (GPS)**– GPS refers to the worldwide positioning, navigation and timing determination capability available from the U.S. satellite constellation. The service provided by GPS for civil use is defined in the GPS Standard Positioning System Performance Standard. GPS is composed of space, control, and user elements.

**GNSS [ICAO]**–

(See **GLOBAL NAVIGATION SATELLITE SYSTEM**.)

**GNSS MEA–**

(See GLOBAL NAVIGATION SATELLITE SYSTEM MINIMUM EN ROUTE IFR ALTITUDE.)

**GO AHEAD–** Proceed with your message. Not to be used for any other purpose.

**GO AROUND–** Instructions for a pilot to abandon his/her approach to landing. Additional instructions may follow. Unless otherwise advised by ATC, a VFR aircraft or an aircraft conducting visual approach should overfly the runway while climbing to traffic pattern altitude and enter the traffic pattern via the crosswind leg. A pilot on an IFR flight plan making an instrument approach should execute the published missed approach procedure or proceed as instructed by ATC; e.g., “Go around” (additional instructions if required).

(See LOW APPROACH.)

(See MISSED APPROACH.)

**GPD–**

(See GRAPHIC PLAN DISPLAY.)

**GPS–**

(See GLOBAL POSITIONING SYSTEM.)

**GRAPHIC PLAN DISPLAY (GPD)–** A view available with EDST that provides a graphic display of aircraft, traffic, and notification of predicted conflicts. Graphic routes for Current Plans and Trial Plans are displayed upon controller request.

(See EN ROUTE DECISION SUPPORT TOOL.)

**GROSS NAVIGATION ERROR (GNE) –** A lateral deviation from a cleared track, normally in excess of 25 Nautical Miles (NM). More stringent standards (for example, 10NM in some parts of the North Atlantic region) may be used in certain regions to support reductions in lateral separation.

**GROUND BASED AUGMENTATION SYSTEM (GBAS)–** A ground based GNSS station which provides local differential corrections, integrity parameters and approach data via VHF data broadcast to GNSS users to meet real-time performance requirements for CAT I precision approaches. The aircraft applies the broadcast data to improve the accuracy and integrity of its GNSS signals and computes the deviations to the selected approach. A single ground station can serve multiple runway ends up to an approximate radius of 23 NM.

**GROUND BASED AUGMENTATION SYSTEM (GBAS) LANDING SYSTEM (GLS)–** A type of precision IAP based on local augmentation of GNSS data using a single GBAS station to transmit locally corrected GNSS data, integrity parameters and approach information. This improves the accuracy of aircraft GNSS receivers’ signal in space, enabling the pilot to fly a precision approach with much greater flexibility, reliability and complexity. The GLS procedure is published on standard IAP charts, features the title GLS with the designated runway and minima as low as 200 feet DA. Future plans are expected to support Cat II and CAT III operations.

**GROUND-BASED TRANSCEIVER (GBT)–** The ground-based transmitter/receiver (transceiver) receives automatic dependent surveillance–broadcast messages, which are forwarded to an air traffic control facility for processing and display with other radar targets on the plan position indicator (radar display).

(See AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST.)

**GROUND CLUTTER–** A pattern produced on the radar scope by ground returns which may degrade other radar returns in the affected area. The effect of ground clutter is minimized by the use of moving target indicator (MTI) circuits in the radar equipment resulting in a radar presentation which displays only targets which are in motion.

(See CLUTTER.)

**GROUND COMMUNICATION OUTLET (GCO)–** An unstaffed, remotely controlled, ground/ground communications facility. Pilots at uncontrolled airports may contact ATC and FSS via VHF to a telephone connection to obtain an instrument clearance or close a VFR or IFR flight plan. They may also get an updated weather briefing prior to takeoff. Pilots will use four “key clicks” on the VHF radio to contact the appropriate ATC facility or six “key clicks” to contact the FSS. The GCO system is intended to be used only on the ground.

**GROUND CONTROLLED APPROACH–** A radar approach system operated from the ground by air traffic control personnel transmitting instructions to the pilot by radio. The approach may be conducted with surveillance radar (ASR) only or with both surveillance and precision approach radar (PAR). Usage of the term “GCA” by pilots is discouraged except when referring to a GCA facility. Pilots should specifically request a “PAR” approach when a

precision radar approach is desired or request an “ASR” or “surveillance” approach when a nonprecision radar approach is desired.

(See RADAR APPROACH.)

**GROUND DELAY PROGRAM (GDP)**– A traffic management process administered by the ATCSCC, when aircraft are held on the ground. The purpose of the program is to support the TM mission and limit airborne holding. It is a flexible program and may be implemented in various forms depending upon the needs of the AT system. Ground delay programs provide for equitable assignment of delays to all system users.

**GROUND SPEED**– The speed of an aircraft relative

to the surface of the earth.

**GROUND STOP (GS)**– The GS is a process that requires aircraft that meet a specific criteria to remain on the ground. The criteria may be airport specific, airspace specific, or equipment specific; for example, all departures to San Francisco, or all departures entering Yorktown sector, or all Category I and II aircraft going to Charlotte. GSs normally occur with little or no warning.

**GROUND VISIBILITY**–

(See VISIBILITY.)

**GS**–

(See GROUND STOP.)



# H

**HAA–**

(See HEIGHT ABOVE AIRPORT.)

**HAL–**

(See HEIGHT ABOVE LANDING.)

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

**HAR–**

(See HIGH ALTITUDE REDESIGN.)

**HAT–**

(See HEIGHT ABOVE TOUCHDOWN.)

**HAVE NUMBERS–** Used by pilots to inform ATC that they have received runway, wind, and altimeter information only.

**HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS)–** Continuous recorded hazardous inflight weather forecasts broadcasted to airborne pilots over selected VOR outlets defined as an HIWAS BROADCAST AREA.

**HAZARDOUS WEATHER INFORMATION–** Summary of significant meteorological information (SIGMET/WS), convective significant meteorological information (convective SIGMET/WST), urgent pilot weather reports (urgent PIREP/UUA), center weather advisories (CWA), airmen's meteorological information (AIRMET/WA) and any other weather such as isolated thunderstorms that are rapidly developing and increasing in intensity, or low ceilings and visibilities that are becoming widespread which is considered significant and are not included in a current hazardous weather advisory.

**HEAVY (AIRCRAFT)–**

(See AIRCRAFT CLASSES.)

**HEIGHT ABOVE AIRPORT (HAA)–** The height of the Minimum Descent Altitude above the published airport elevation. This is published in conjunction with circling minimums.

(See MINIMUM DESCENT ALTITUDE.)

**HEIGHT ABOVE LANDING (HAL)–** The height above a designated helicopter landing area used for helicopter instrument approach procedures.

(Refer to 14 CFR Part 97.)

**HEIGHT ABOVE TOUCHDOWN (HAT)–** The height of the Decision Height or Minimum Descent Altitude above the highest runway elevation in the touchdown zone (first 3,000 feet of the runway). HAT is published on instrument approach charts in conjunction with all straight-in minimums.

(See DECISION HEIGHT.)

(See MINIMUM DESCENT ALTITUDE.)

**HELICOPTER–** A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.

**HELIPAD–** A small, designated area, usually with a prepared surface, on a heliport, airport, landing/take-off area, apron/ramp, or movement area used for takeoff, landing, or parking of helicopters.

**HELIPORT–** An area of land, water, or structure used or intended to be used for the landing and takeoff of helicopters and includes its buildings and facilities if any.

**HELIPORT REFERENCE POINT (HRP)–** The geographic center of a heliport.

**HERTZ–** The standard radio equivalent of frequency in cycles per second of an electromagnetic wave. Kilohertz (kHz) is a frequency of one thousand cycles per second. Megahertz (MHz) is a frequency of one million cycles per second.

**HF–**

(See HIGH FREQUENCY.)

**HF COMMUNICATIONS–**

(See HIGH FREQUENCY COMMUNICATIONS.)

**HIGH ALTITUDE REDESIGN (HAR)–** A level of non-restrictive routing (NRR) service for aircraft that have all waypoints associated with the HAR program in their flight management systems or RNAV equipage.

**HIGH FREQUENCY–** The frequency band between 3 and 30 MHz.

(See HIGH FREQUENCY COMMUNICATIONS.)

**HIGH FREQUENCY COMMUNICATIONS**– High radio frequencies (HF) between 3 and 30 MHz used for air-to-ground voice communication in overseas operations.

**HIGH SPEED EXIT**–

(See HIGH SPEED TAXIWAY.)

**HIGH SPEED TAXIWAY**– A long radius taxiway designed and provided with lighting or marking to define the path of aircraft, traveling at high speed (up to 60 knots), from the runway center to a point on the center of a taxiway. Also referred to as long radius exit or turn-off taxiway. The high speed taxiway is designed to expedite aircraft turning off the runway after landing, thus reducing runway occupancy time.

**HIGH SPEED TURNOFF**–

(See HIGH SPEED TAXIWAY.)

**HIWAS**–

(See HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE.)

**HIWAS AREA**–

(See HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE.)

**HIWAS BROADCAST AREA**– A geographical area of responsibility including one or more HIWAS outlet areas assigned to a FSS for hazardous weather advisory broadcasting.

**HIWAS OUTLET AREA**– An area defined as a 150 NM radius of a HIWAS outlet, expanded as necessary to provide coverage.

**HOLD FOR RELEASE**– Used by ATC to delay an aircraft for traffic management reasons; i.e., weather, traffic volume, etc. Hold for release instructions (including departure delay information) are used to inform a pilot or a controller (either directly or through an authorized relay) that an IFR departure clearance is not valid until a release time or additional instructions have been received.

(See ICAO term HOLDING POINT.)

**HOLD-IN-LIEU OF PROCEDURE TURN**– A hold-in-lieu of procedure turn shall be established over a final or intermediate fix when an approach can be made from a properly aligned holding pattern. The hold-in-lieu of procedure turn permits the pilot to align with the final or intermediate segment of the approach and/or descend in the holding pattern to an

altitude that will permit a normal descent to the final approach fix altitude. The hold-in-lieu of procedure turn is a required maneuver (the same as a procedure turn) unless the aircraft is being radar vectored to the final approach course, when “NoPT” is shown on the approach chart, or when the pilot requests or the controller advises the pilot to make a “straight-in” approach.

**HOLD PROCEDURE**– A predetermined maneuver which keeps aircraft within a specified airspace while awaiting further clearance from air traffic control. Also used during ground operations to keep aircraft within a specified area or at a specified point while awaiting further clearance from air traffic control.

(See HOLDING FIX.)

(Refer to AIM.)

**HOLDING FIX**– A specified fix identifiable to a pilot by NAVAIDs or visual reference to the ground used as a reference point in establishing and maintaining the position of an aircraft while holding.

(See FIX.)

(See VISUAL HOLDING.)

(Refer to AIM.)

**HOLDING POINT [ICAO]**– A specified location, identified by visual or other means, in the vicinity of which the position of an aircraft in flight is maintained in accordance with air traffic control clearances.

**HOLDING PROCEDURE**–

(See HOLD PROCEDURE.)

**HOLD-SHORT POINT**– A point on the runway beyond which a landing aircraft with a LAHSO clearance is not authorized to proceed. This point may be located prior to an intersecting runway, taxiway, predetermined point, or approach/departure flight path.

**HOLD-SHORT POSITION LIGHTS**– Flashing in-pavement white lights located at specified hold-short points.

**HOLD-SHORT POSITION MARKING**– The painted runway marking located at the hold-short point on all LAHSO runways.

**HOLD-SHORT POSITION SIGNS**– Red and white holding position signs located alongside the hold-short point.

**HOMING**– Flight toward a NAVAID, without correcting for wind, by adjusting the aircraft heading to maintain a relative bearing of zero degrees.

(See BEARING.)

(See ICAO term HOMING.)

**HOMING [ICAO]**– The procedure of using the direction-finding equipment of one radio station with the emission of another radio station, where at least one of the stations is mobile, and whereby the mobile station proceeds continuously towards the other station.

**HOVER CHECK**– Used to describe when a helicopter/VTOL aircraft requires a stabilized hover to conduct a performance/power check prior to hover taxi, air taxi, or takeoff. Altitude of the hover will vary based on the purpose of the check.

**HOVER TAXI**– Used to describe a helicopter/VTOL aircraft movement conducted above the surface and in ground effect at airspeeds less than approximately 20 knots. The actual height may vary, and some helicopters may require hover taxi above 25 feet AGL to reduce ground effect turbulence or provide clearance for cargo slingloads.

(See AIR TAXI.)

(See HOVER CHECK.)

(Refer to AIM.)

**HOW DO YOU HEAR ME?**– A question relating to the quality of the transmission or to determine how well the transmission is being received.

**HZ**–

(See HERTZ.)





# I

***I SAY AGAIN***– The message will be repeated.

**IAF**–

(See INITIAL APPROACH FIX.)

**IAP**–

(See INSTRUMENT APPROACH PROCEDURE.)

**IAWP**– Initial Approach Waypoint

**ICAO**–

(See ICAO Term INTERNATIONAL CIVIL AVIATION ORGANIZATION.)

**ICING**– The accumulation of airframe ice.

Types of icing are:

**a. Rime Ice**– Rough, milky, opaque ice formed by the instantaneous freezing of small supercooled water droplets.

**b. Clear Ice**– A glossy, clear, or translucent ice formed by the relatively slow freezing or large supercooled water droplets.

**c. Mixed**– A mixture of clear ice and rime ice.

Intensity of icing:

**a. Trace**– Ice becomes perceptible. Rate of accumulation is slightly greater than the rate of sublimation. Deicing/anti-icing equipment is not utilized unless encountered for an extended period of time (over 1 hour).

**b. Light**– The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used.

**c. Moderate**– The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or flight diversion is necessary.

**d. Severe**– The rate of ice accumulation is such that ice protection systems fail to remove the accumulation of ice, or ice accumulates in locations not normally prone to icing, such as areas aft of protected surfaces and any other areas identified by

the manufacturer. Immediate exit from the condition is necessary.

**Note:**

Severe icing is aircraft dependent, as are the other categories of icing intensity. Severe icing may occur at any ice accumulation rate.

***IDENT***– A request for a pilot to activate the aircraft transponder identification feature. This will help the controller to confirm an aircraft identity or to identify an aircraft.

(Refer to AIM.)

**IDENT FEATURE**– The special feature in the Air Traffic Control Radar Beacon System (ATCRBS) equipment. It is used to immediately distinguish one displayed beacon target from other beacon targets.

(See IDENT.)

**IDENTIFICATION [ICAO]**– The situation which exists when the position indication of a particular aircraft is seen on a situation display and positively identified.

**IF**–

(See INTERMEDIATE FIX.)

**IFIM**–

(See INTERNATIONAL FLIGHT INFORMATION MANUAL.)

***IF NO TRANSMISSION RECEIVED FOR (TIME)***– Used by ATC in radar approaches to prefix procedures which should be followed by the pilot in event of lost communications.

(See LOST COMMUNICATIONS.)

**IFR**–

(See INSTRUMENT FLIGHT RULES.)

**IFR AIRCRAFT**– An aircraft conducting flight in accordance with instrument flight rules.

**IFR CONDITIONS**– Weather conditions below the minimum for flight under visual flight rules.

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

**IFR DEPARTURE PROCEDURE**–

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(Refer to AIM.)

**IFR FLIGHT**–

(See IFR AIRCRAFT.)

**IFR LANDING MINIMUMS–**

(See LANDING MINIMUMS.)

**IFR MILITARY TRAINING ROUTES (IR)–** Routes used by the Department of Defense and associated Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training in both IFR and VFR weather conditions below 10,000 feet MSL at airspeeds in excess of 250 knots IAS.

**IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES–** Title 14 Code of Federal Regulations Part 91, prescribes standard takeoff rules for certain civil users. At some airports, obstructions or other factors require the establishment of nonstandard takeoff minimums, departure procedures, or both to assist pilots in avoiding obstacles during climb to the minimum en route altitude. Those airports are listed in FAA/DOD Instrument Approach Procedures (IAPs) Charts under a section entitled “IFR Takeoff Minimums and Departure Procedures.” The FAA/DOD IAP chart legend illustrates the symbol used to alert the pilot to nonstandard takeoff minimums and departure procedures. When departing IFR from such airports or from any airports where there are no departure procedures, DPs, or ATC facilities available, pilots should advise ATC of any departure limitations. Controllers may query a pilot to determine acceptable departure directions, turns, or headings after takeoff. Pilots should be familiar with the departure procedures and must assure that their aircraft can meet or exceed any specified climb gradients.

**IF/IAWP–** Intermediate Fix/Initial Approach Waypoint. The waypoint where the final approach course of a T approach meets the crossbar of the T. When designated (in conjunction with a TAA) this waypoint will be used as an IAWP when approaching the airport from certain directions, and as an IFWP when beginning the approach from another IAWP.

**IFWP–** Intermediate Fix Waypoint

**IILS–**

(See INSTRUMENT LANDING SYSTEM.)

**ILS CATEGORIES–** 1. Category I. An ILS approach procedure which provides for approach to a height above touchdown of not less than 200 feet and with runway visual range of not less than 1,800 feet.– 2. Special Authorization Category I. An ILS approach procedure which provides for approach to

a height above touchdown of not less than 150 feet and with runway visual range of not less than 1,400 feet, HUD to DH. 3. Category II. An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet (with autoland or HUD to touchdown and noted on authorization, RVR 1,000 feet).– 4. Special Authorization Category II with Reduced Lighting. An ILS approach procedure which provides for approach to a height above touchdown of not less than 100 feet and with runway visual range of not less than 1,200 feet with autoland or HUD to touchdown and noted on authorization (no touchdown zone and centerline lighting are required).– 5. Category III:

**a. IIIA.–**An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 700 feet.

**b. IIIB.–**An ILS approach procedure which provides for approach without a decision height minimum and with runway visual range of not less than 150 feet.

**c. IIIC.–**An ILS approach procedure which provides for approach without a decision height minimum and without runway visual range minimum.

**ILS PRM APPROACH–** An instrument landing system (ILS) approach conducted to parallel runways whose extended centerlines are separated by less than 4,300 feet and at least 3,000 feet where independent closely spaced approaches are permitted. Also used in conjunction with an LDA PRM, RNAV PRM or GLS PRM approach to conduct Simultaneous Offset Instrument Approach (SOIA) operations. No Transgression Zone (NTZ) monitoring is required to conduct these approaches. ATC utilizes an enhanced display with alerting and, with certain runway spacing, a high update rate PRM surveillance sensor. Use of a secondary monitor frequency, pilot PRM training, and publication of an Attention All Users Page are also required for all PRM approaches.

(Refer to AIM)

**IM–**

(See INNER MARKER.)

**IMC–**

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

**IMMEDIATELY**– Used by ATC or pilots when such action compliance is required to avoid an imminent situation.

**INCERFA (Uncertainty Phase) [ICAO]**– A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

**INCREASED SEPARATION REQUIRED (ISR)**– Indicates the confidence level of the track requires 5NM separation. 3NM separation, 1 1/2NM separation, and target resolution cannot be used.

**INCREASE SPEED TO (SPEED)**–

(See SPEED ADJUSTMENT.)

**INERTIAL NAVIGATION SYSTEM (INS)**– An RNAV system which is a form of self-contained navigation.

(See Area Navigation/RNAV.)

**INFLIGHT REFUELING**–

(See AERIAL REFUELING.)

**INFLIGHT WEATHER ADVISORY**–

(See WEATHER ADVISORY.)

**INFORMATION REQUEST (INREQ)**– A request originated by an FSS for information concerning an overdue VFR aircraft.

**INITIAL APPROACH FIX (IAF)**– The fixes depicted on instrument approach procedure charts that identify the beginning of the initial approach segment(s).

(See FIX.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**INITIAL APPROACH SEGMENT**–

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**INITIAL APPROACH SEGMENT [ICAO]**– That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

**INLAND NAVIGATION FACILITY**– A navigation aid on a North American Route at which the common route and/or the noncommon route begins or ends.

**INNER MARKER**– A marker beacon used with an ILS (CAT II) precision approach located between the middle marker and the end of the ILS runway, transmitting a radiation pattern keyed at six dots per

second and indicating to the pilot, both aurally and visually, that he/she is at the designated decision height (DH), normally 100 feet above the touchdown zone elevation, on the ILS CAT II approach. It also marks progress during a CAT III approach.

(See INSTRUMENT LANDING SYSTEM.)

(Refer to AIM.)

**INNER MARKER BEACON**–

(See INNER MARKER.)

**INREQ**–

(See INFORMATION REQUEST.)

**INS**–

(See INERTIAL NAVIGATION SYSTEM.)

**INSTRUMENT APPROACH**–

(See INSTRUMENT APPROACH PROCEDURE.)

**INSTRUMENT APPROACH OPERATIONS [ICAO]**– An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

a. A two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and

b. A three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

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

a) a ground-based radio navigation aid; or

b) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.

(See ICAO term INSTRUMENT APPROACH PROCEDURE.)

**INSTRUMENT APPROACH PROCEDURE**– A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. It is prescribed and approved for a specific airport by competent authority.

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

a. U.S. civil standard instrument approach procedures are approved by the FAA as prescribed

under 14 CFR Part 97 and are available for public use.

**b.** U.S. military standard instrument approach procedures are approved and published by the Department of Defense.

**c.** Special instrument approach procedures are approved by the FAA for individual operators but are not published in 14 CFR Part 97 for public use.

(See ICAO term INSTRUMENT APPROACH PROCEDURE.)

**INSTRUMENT APPROACH PROCEDURE [ICAO]**– A series of predetermined maneuvers by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.

(See ICAO term INSTRUMENT APPROACH OPERATIONS)

**INSTRUMENT APPROACH PROCEDURE CHARTS**–

(See AERONAUTICAL CHART.)

**INSTRUMENT DEPARTURE PROCEDURE (DP)**– A preplanned instrument flight rule (IFR) departure procedure published for pilot use, in graphic or textual format, that provides obstruction clearance from the terminal area to the appropriate en route structure. There are two types of DP, Obstacle Departure Procedure (ODP), printed either textually or graphically, and, Standard Instrument Departure (SID), which is always printed graphically.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See OBSTACLE DEPARTURE PROCEDURES.)

(See STANDARD INSTRUMENT DEPARTURES.)

(Refer to AIM.)

**INSTRUMENT DEPARTURE PROCEDURE (DP) CHARTS**–

(See AERONAUTICAL CHART.)

**INSTRUMENT FLIGHT RULES (IFR)**– Rules governing the procedures for conducting instrument

flight. Also a term used by pilots and controllers to indicate type of flight plan.

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

(See VISUAL FLIGHT RULES.)

(See VISUAL METEOROLOGICAL CONDITIONS.)

(See ICAO term INSTRUMENT FLIGHT RULES.)

(Refer to AIM.)

**INSTRUMENT FLIGHT RULES [ICAO]**– A set of rules governing the conduct of flight under instrument meteorological conditions.

**INSTRUMENT LANDING SYSTEM (ILS)**– A precision instrument approach system which normally consists of the following electronic components and visual aids:

**a.** Localizer.

(See LOCALIZER.)

**b.** Glideslope.

(See GLIDESLOPE.)

**c.** Outer Marker.

(See OUTER MARKER.)

**d.** Middle Marker.

(See MIDDLE MARKER.)

**e.** Approach Lights.

(See AIRPORT LIGHTING.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)**– Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling less than the minima specified for visual meteorological conditions.

(See INSTRUMENT FLIGHT RULES.)

(See VISUAL FLIGHT RULES.)

(See VISUAL METEOROLOGICAL CONDITIONS.)

**INSTRUMENT RUNWAY**– A runway equipped with electronic and visual navigation aids for which a precision or nonprecision approach procedure having straight-in landing minimums has been approved.

(See ICAO term INSTRUMENT RUNWAY.)

**INSTRUMENT RUNWAY [ICAO]**– One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

**a. Nonprecision Approach Runway**– An instrument runway served by visual aids and a nonvisual aid providing at least directional guidance adequate for a straight-in approach.

**b. Precision Approach Runway, Category I**– An instrument runway served by ILS and visual aids intended for operations down to 60 m (200 feet) decision height and down to an RVR of the order of 800 m.

**c. Precision Approach Runway, Category II**– An instrument runway served by ILS and visual aids intended for operations down to 30 m (100 feet) decision height and down to an RVR of the order of 400 m.

**d. Precision Approach Runway, Category III**– An instrument runway served by ILS to and along the surface of the runway and:

**1.** Intended for operations down to an RVR of the order of 200 m (no decision height being applicable) using visual aids during the final phase of landing;

**2.** Intended for operations down to an RVR of the order of 50 m (no decision height being applicable) using visual aids for taxiing;

**3.** Intended for operations without reliance on visual reference for landing or taxiing.

Note 1: See Annex 10 Volume I, Part I, Chapter 3, for related ILS specifications.

Note 2: Visual aids need not necessarily be matched to the scale of nonvisual aids provided. The criterion for the selection of visual aids is the conditions in which operations are intended to be conducted.

**INTEGRITY**– The ability of a system to provide timely warnings to users when the system should not be used for navigation.

**INTERMEDIATE APPROACH SEGMENT**–  
(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**INTERMEDIATE APPROACH SEGMENT [ICAO]**– That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, race track or dead reckoning track procedure and the final approach fix or point, as appropriate.

**INTERMEDIATE FIX**– The fix that identifies the beginning of the intermediate approach segment of an instrument approach procedure. The fix is not normally identified on the instrument approach chart as an intermediate fix (IF).

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**INTERMEDIATE LANDING**– On the rare occasion that this option is requested, it should be approved. The departure center, however, must advise the ATCSCC so that the appropriate delay is carried over and assigned at the intermediate airport. An intermediate landing airport within the arrival center will not be accepted without coordination with and the approval of the ATCSCC.

**INTERNATIONAL AIRPORT**– Relating to international flight, it means:

**a.** An airport of entry which has been designated by the Secretary of Treasury or Commissioner of Customs as an international airport for customs service.

**b.** A landing rights airport at which specific permission to land must be obtained from customs authorities in advance of contemplated use.

**c.** Airports designated under the Convention on International Civil Aviation as an airport for use by international commercial air transport and/or international general aviation.

(See ICAO term INTERNATIONAL AIRPORT.)

(Refer to Chart Supplement U.S.)

(Refer to IFIM.)

**INTERNATIONAL AIRPORT [ICAO]**– Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

**INTERNATIONAL CIVIL AVIATION ORGANIZATION [ICAO]**– A specialized agency of the United Nations whose objective is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.

**a.** Regions include:

- 1.** African-Indian Ocean Region
- 2.** Caribbean Region
- 3.** European Region

4. Middle East/Asia Region
5. North American Region
6. North Atlantic Region
7. Pacific Region
8. South American Region

**INTERNATIONAL FLIGHT INFORMATION MANUAL (IFIM)**– A publication designed primarily as a pilot's preflight planning guide for flights into foreign airspace and for flights returning to the U.S. from foreign locations.

**INTERROGATOR**– The ground-based surveillance radar beacon transmitter-receiver, which normally scans in synchronism with a primary radar, transmitting discrete radio signals which repetitiously request all transponders on the mode being used to reply. The replies received are mixed with the primary radar returns and displayed on the same plan position indicator (radar scope). Also, applied to the airborne element of the TACAN/DME system.

(See TRANSPONDER.)

(Refer to AIM.)

**INTERSECTING RUNWAYS**– Two or more runways which cross or meet within their lengths.

(See INTERSECTION.)

**INTERSECTION**–

a. A point defined by any combination of courses, radials, or bearings of two or more navigational aids.

b. Used to describe the point where two runways, a runway and a taxiway, or two taxiways cross or meet.

**INTERSECTION DEPARTURE**– A departure from any runway intersection except the end of the runway.

(See INTERSECTION.)

**INTERSECTION TAKEOFF**–

(See INTERSECTION DEPARTURE.)

**IR**–

(See IFR MILITARY TRAINING ROUTES.)

**IRREGULAR SURFACE**– A surface that is open for use but not per regulations.

**ISR**–

(See INCREASED SEPARATION REQUIRED.)

# J

**JAMMING**– Electronic or mechanical interference which may disrupt the display of aircraft on radar or the transmission/reception of radio communications/navigation.

**JET BLAST**– Jet engine exhaust (thrust stream turbulence).

(See **WAKE TURBULENCE**.)

**JET ROUTE**– A route designed to serve aircraft operations from 18,000 feet MSL up to and including flight level 450. The routes are referred to as “J” routes with numbering to identify the designated route; e.g., J105.

(See **Class A AIRSPACE**.)

(Refer to 14 CFR Part 71.)

**JET STREAM**– A migrating stream of high-speed winds present at high altitudes.

**JETTISONING OF EXTERNAL STORES**– Airborne release of external stores; e.g., tip tanks, ordnance.

(See **FUEL DUMPING**.)

(Refer to 14 CFR Part 91.)

**JOINT USE RESTRICTED AREA**–

(See **RESTRICTED AREA**.)

**JUMP ZONE**– The airspace directly associated with a Drop Zone. Vertical and horizontal limits may be locally defined.





# K

**KNOWN TRAFFIC**– With respect to ATC clearances, means aircraft whose altitude, position, and intentions are known to ATC.



# L

LAA–

(See LOCAL AIRPORT ADVISORY.)

LAAS–

(See LOW ALTITUDE ALERT SYSTEM.)

LAHSO– An acronym for “Land and Hold Short Operation.” These operations include landing and holding short of an intersecting runway, a taxiway, a predetermined point, or an approach/departure flightpath.

LAHSO-DRY– Land and hold short operations on runways that are dry.

LAHSO-WET– Land and hold short operations on runways that are wet (but not contaminated).

LAND AND HOLD SHORT OPERATIONS– Operations which include simultaneous takeoffs and landings and/or simultaneous landings when a landing aircraft is able and is instructed by the controller to hold-short of the intersecting runway/taxiway or designated hold-short point. Pilots are expected to promptly inform the controller if the hold short clearance cannot be accepted.

(See PARALLEL RUNWAYS.)

(Refer to AIM.)

LAND-BASED AIR DEFENSE IDENTIFICATION ZONE (ADIZ)– An ADIZ over U.S. metropolitan areas, which is activated and deactivated as needed, with dimensions, activation dates, and other relevant information disseminated via NOTAM.

(See AIR DEFENSE IDENTIFICATION ZONE.)

LANDING AREA– Any locality either on land, water, or structures, including airports/heliports and intermediate landing fields, which is used, or intended to be used, for the landing and takeoff of aircraft whether or not facilities are provided for the shelter, servicing, or for receiving or discharging passengers or cargo.

(See ICAO term LANDING AREA.)

LANDING AREA [ICAO]– That part of a movement area intended for the landing or take-off of aircraft.

LANDING DIRECTION INDICATOR– A device which visually indicates the direction in which landings and takeoffs should be made.

(See TETRAHEDRON.)

(Refer to AIM.)

LANDING DISTANCE AVAILABLE (LDA)– The runway length declared available and suitable for a landing airplane.

(See ICAO term LANDING DISTANCE AVAILABLE.)

LANDING DISTANCE AVAILABLE [ICAO]– The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

LANDING MINIMUMS– The minimum visibility prescribed for landing a civil aircraft while using an instrument approach procedure. The minimum applies with other limitations set forth in 14 CFR Part 91 with respect to the Minimum Descent Altitude (MDA) or Decision Height (DH) prescribed in the instrument approach procedures as follows:

a. Straight-in landing minimums. A statement of MDA and visibility, or DH and visibility, required for a straight-in landing on a specified runway, or

b. Circling minimums. A statement of MDA and visibility required for the circle-to-land maneuver.

Note: Descent below the MDA or DH must meet the conditions stated in 14 CFR Section 91.175.

(See CIRCLE-TO-LAND MANEUVER.)

(See DECISION HEIGHT.)

(See INSTRUMENT APPROACH PROCEDURE.)

(See MINIMUM DESCENT ALTITUDE.)

(See STRAIGHT-IN LANDING.)

(See VISIBILITY.)

(Refer to 14 CFR Part 91.)

LANDING ROLL– The distance from the point of touchdown to the point where the aircraft can be brought to a stop or exit the runway.

LANDING SEQUENCE– The order in which aircraft are positioned for landing.

(See APPROACH SEQUENCE.)

LAST ASSIGNED ALTITUDE– The last altitude/flight level assigned by ATC and acknowledged by the pilot.

(See MAINTAIN.)

(Refer to 14 CFR Part 91.)

**LATERAL NAVIGATION (LNAV)**– A function of area navigation (RNAV) equipment which calculates, displays, and provides lateral guidance to a profile or path.

**LATERAL SEPARATION**– The lateral spacing of aircraft at the same altitude by requiring operation on different routes or in different geographical locations.

(See SEPARATION.)

**LDA**–

(See LOCALIZER TYPE DIRECTIONAL AID.)

(See LANDING DISTANCE AVAILABLE.)

(See ICAO Term LANDING DISTANCE AVAILABLE.)

**LF**–

(See LOW FREQUENCY.)

**LIGHTED AIRPORT**– An airport where runway and obstruction lighting is available.

(See AIRPORT LIGHTING.)

(Refer to AIM.)

**LIGHT GUN**– A handheld directional light signaling device which emits a brilliant narrow beam of white, green, or red light as selected by the tower controller. The color and type of light transmitted can be used to approve or disapprove anticipated pilot actions where radio communication is not available. The light gun is used for controlling traffic operating in the vicinity of the airport and on the airport movement area.

(Refer to AIM.)

**LIGHT-SPORT AIRCRAFT (LSA)**– An FAA-registered aircraft, other than a helicopter or powered-lift, that meets certain weight and performance. Principally it is a single-engine aircraft with a maximum of two seats and weighing no more than 1,430 pounds if intended for operation on water, or 1,320 pounds if not. It must be of simple design (fixed landing gear (except if intended for operations on water or a glider), piston powered, nonpressurized, with a fixed or ground adjustable propeller). Performance is also limited to a maximum airspeed in level flight of not more than 120 knots calibrated airspeed (CAS), have a maximum never-exceed speed of not more than 120 knots CAS for a glider, and have a maximum stalling speed, without the use of lift-enhancing devices of not more than 45 knots CAS. It may be certificated as either Experimental LSA or as a Special LSA aircraft. A

minimum of a sport pilot certificate is required to operate light-sport aircraft.

(Refer to 14 CFR Part 1, §1.1.)

**LINE UP AND WAIT (LUAW)**– Used by ATC to inform a pilot to taxi onto the departure runway to line up and wait. It is not authorization for takeoff. It is used when takeoff clearance cannot immediately be issued because of traffic or other reasons.

(See CLEARED FOR TAKEOFF.)

**LOCAL AIRPORT ADVISORY (LAA)**– A service available only in Alaska and provided by facilities that are located on the landing airport, have a discrete ground-to-air communication frequency or the tower frequency when the tower is closed, automated weather reporting with voice broadcasting, and a continuous ASOS/AWSS/AWOS data display, other continuous direct reading instruments, or manual observations available to the specialist.

(See AIRPORT ADVISORY AREA.)

**LOCAL TRAFFIC**– Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

(See TRAFFIC PATTERN.)

**LOCALIZER**– The component of an ILS which provides course guidance to the runway.

(See INSTRUMENT LANDING SYSTEM.)

(See ICAO term LOCALIZER COURSE.)

(Refer to AIM.)

**LOCALIZER COURSE [ICAO]**– The locus of points, in any given horizontal plane, at which the DDM (difference in depth of modulation) is zero.

**LOCALIZER OFFSET**– An angular offset of the localizer aligned within 3° of the runway alignment.

**LOCALIZER TYPE DIRECTIONAL AID (LDA)**– A localizer with an angular offset that exceeds 3° of the runway alignment, used for nonprecision instrument approaches with utility and accuracy comparable to a localizer, but which are not part of a complete ILS.

(Refer to AIM.)

**LOCALIZER TYPE DIRECTIONAL AID (LDA) PRECISION RUNWAY MONITOR (PRM) APPROACH**– An approach, which includes a glideslope, used in conjunction with an ILS PRM, RNAV PRM or GLS PRM approach to an adjacent runway to conduct Simultaneous Offset Instrument

Approaches (SOIA) to parallel runways whose centerlines are separated by less than 3,000 feet and at least 750 feet. NTZ monitoring is required to conduct these approaches.

(See SIMULTANEOUS OFFSET INSTRUMENT APPROACH (SOIA).)

(Refer to AIM.)

**LOCALIZER USABLE DISTANCE**– The maximum distance from the localizer transmitter at a specified altitude, as verified by flight inspection, at which reliable course information is continuously received.

(Refer to AIM.)

**LOCATOR [ICAO]**– An LM/MF NDB used as an aid to final approach.

Note: A locator usually has an average radius of rated coverage of between 18.5 and 46.3 km (10 and 25 NM).

**LONG RANGE NAVIGATION**–

(See LORAN.)

**LONGITUDINAL SEPARATION**– The longitudinal spacing of aircraft at the same altitude by a minimum distance expressed in units of time or miles.

(See SEPARATION.)

(Refer to AIM.)

**LORAN**– An electronic navigational system by which hyperbolic lines of position are determined by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran A operates in the 1750-1950 kHz frequency band. Loran C and D operate in the 100-110 kHz frequency band. In 2010, the U.S. Coast Guard terminated all U.S. LORAN-C transmissions.

(Refer to AIM.)

**LOST COMMUNICATIONS**– Loss of the ability to communicate by radio. Aircraft are sometimes referred to as NORDO (No Radio). Standard pilot procedures are specified in 14 CFR Part 91. Radar controllers issue procedures for pilots to follow in the event of lost communications during a radar approach when weather reports indicate that an aircraft will likely encounter IFR weather conditions during the approach.

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**LOST LINK (LL)**– An interruption or loss of the control link, or when the pilot is unable to effect control of the aircraft and, as a result, the UA will perform a predictable or planned maneuver. Loss of command and control link between the Control Station and the aircraft. There are two types of links:

a. An uplink which transmits command instructions to the aircraft, and

b. A downlink which transmits the status of the aircraft and provides situational awareness to the pilot.

**LOST LINK PROCEDURE**– Preprogrammed or predetermined mitigations to ensure the continued safe operation of the UA in the event of a lost link (LL). In the event positive link cannot be established, flight termination must be implemented.

**LOW ALTITUDE AIRWAY STRUCTURE**– The network of airways serving aircraft operations up to but not including 18,000 feet MSL.

(See AIRWAY.)

(Refer to AIM.)

***LOW ALTITUDE ALERT, CHECK YOUR ALTITUDE IMMEDIATELY***–

(See SAFETY ALERT.)

**LOW APPROACH**– An approach over an airport or runway following an instrument approach or a VFR approach including the go-around maneuver where the pilot intentionally does not make contact with the runway.

(Refer to AIM.)

**LOW FREQUENCY (LF)**– The frequency band between 30 and 300 kHz.

(Refer to AIM.)

**LOCALIZER PERFORMANCE WITH VERTICAL GUIDANCE (LPV)**– A type of approach with vertical guidance (APV) based on WAAS, published on RNAV (GPS) approach charts. This procedure takes advantage of the precise lateral guidance available from WAAS. The minima is published as a decision altitude (DA).

**LUAW**–

(See LINE UP AND WAIT.)



# M

**MAA–**

(See MAXIMUM AUTHORIZED ALTITUDE.)

**MACH NUMBER–** The ratio of true airspeed to the speed of sound; e.g., MACH .82, MACH 1.6.

(See AIRSPEED.)

**MACH TECHNIQUE [ICAO]–** Describes a control technique used by air traffic control whereby turbojet aircraft operating successively along suitable routes are cleared to maintain appropriate MACH numbers for a relevant portion of the en route phase of flight. The principle objective is to achieve improved utilization of the airspace and to ensure that separation between successive aircraft does not decrease below the established minima.

**MAHWP–** Missed Approach Holding Waypoint

***MAINTAIN–***

**a.** Concerning altitude/flight level, the term means to remain at the altitude/flight level specified. The phrase “climb and” or “descend and” normally precedes “maintain” and the altitude assignment; e.g., “descend and maintain 5,000.”

**b.** Concerning other ATC instructions, the term is used in its literal sense; e.g., maintain VFR.

**MAINTENANCE PLANNING FRICTION LEVEL–** The friction level specified in AC 150/5320-12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces, which represents the friction value below which the runway pavement surface remains acceptable for any category or class of aircraft operations but which is beginning to show signs of deterioration. This value will vary depending on the particular friction measurement equipment used.

***MAKE SHORT APPROACH–*** Used by ATC to inform a pilot to alter his/her traffic pattern so as to make a short final approach.

(See TRAFFIC PATTERN.)

**MAN PORTABLE AIR DEFENSE SYSTEMS (MANPADS)–** MANPADS are lightweight, shoulder-launched, missile systems used to bring down aircraft and create mass casualties. The potential for MANPADS use against airborne aircraft

is real and requires familiarity with the subject. Terrorists choose MANPADS because the weapons are low cost, highly mobile, require minimal set-up time, and are easy to use and maintain. Although the weapons have limited range, and their accuracy is affected by poor visibility and adverse weather, they can be fired from anywhere on land or from boats where there is unrestricted visibility to the target.

**MANDATORY ALTITUDE–** An altitude depicted on an instrument Approach Procedure Chart requiring the aircraft to maintain altitude at the depicted value.

**MANPADS–**

(See MAN PORTABLE AIR DEFENSE SYSTEMS.)

**MAP–**

(See MISSED APPROACH POINT.)

**MARKER BEACON–** An electronic navigation facility transmitting a 75 MHz vertical fan or boneshaped radiation pattern. Marker beacons are identified by their modulation frequency and keying code, and when received by compatible airborne equipment, indicate to the pilot, both aurally and visually, that he/she is passing over the facility.

(See INNER MARKER.)

(See MIDDLE MARKER.)

(See OUTER MARKER.)

(Refer to AIM.)

**MARSA–**

(See MILITARY AUTHORITY ASSUMES RESPONSIBILITY FOR SEPARATION OF AIRCRAFT.)

**MAWP–** Missed Approach Waypoint

**MAXIMUM AUTHORIZED ALTITUDE–** A published altitude representing the maximum usable altitude or flight level for an airspace structure or route segment. It is the highest altitude on a Federal airway, jet route, area navigation low or high route, or other direct route for which an MEA is designated in 14 CFR Part 95 at which adequate reception of navigation aid signals is assured.

***MAYDAY–*** The international radiotelephony distress signal. When repeated three times, it indicates

imminent and grave danger and that immediate assistance is requested.

(See PAN-PAN.)

(Refer to AIM.)

MCA–

(See MINIMUM CROSSING ALTITUDE.)

MDA–

(See MINIMUM DESCENT ALTITUDE.)

MEA–

(See MINIMUM EN ROUTE IFR ALTITUDE.)

MEARTS–

(See MICRO-EN ROUTE AUTOMATED RADAR TRACKING SYSTEM.)

METEOROLOGICAL IMPACT STATEMENT–

An unscheduled planning forecast describing conditions expected to begin within 4 to 12 hours which may impact the flow of air traffic in a specific center's (ARTCC) area.

METER FIX ARC– A semicircle, equidistant from a meter fix, usually in low altitude relatively close to the meter fix, used to help CTAS/ERAM calculate a meter time, and determine appropriate sector meter list assignments for aircraft not on an established arrival route or assigned a meter fix.

METER FIX TIME/SLOT TIME (MFT)– A calculated time to depart the meter fix in order to cross the vertex at the ACLT. This time reflects descent speed adjustment and any applicable time that must be absorbed prior to crossing the meter fix.

METER LIST–

(See ARRIVAL SECTOR ADVISORY LIST.)

METER LIST DISPLAY INTERVAL– A dynamic parameter which controls the number of minutes prior to the flight plan calculated time of arrival at the meter fix for each aircraft, at which time the TCLT is frozen and becomes an ACLT; i.e., the VTA is updated and consequently the TCLT modified as appropriate until frozen at which time updating is suspended and an ACLT is assigned. When frozen, the flight entry is inserted into the arrival sector's meter list for display on the sector PVD/MDM. MLDI is used if filed true airspeed is less than or equal to freeze speed parameters (FSPD).

METERING– A method of time-regulating arrival traffic flow into a terminal area so as not to exceed a predetermined terminal acceptance rate.

METERING AIRPORTS– Airports adapted for metering and for which optimum flight paths are defined. A maximum of 15 airports may be adapted.

METERING FIX– A fix along an established route from over which aircraft will be metered prior to entering terminal airspace. Normally, this fix should be established at a distance from the airport which will facilitate a profile descent 10,000 feet above airport elevation (AAE) or above.

METERING POSITION(S)– Adapted PVDs/MDMs and associated "D" positions eligible for display of a metering position list. A maximum of four PVDs/MDMs may be adapted.

METERING POSITION LIST– An ordered list of data on arrivals for a selected metering airport displayed on a metering position PVD/MDM.

MFT–

(See METER FIX TIME/SLOT TIME.)

MHA–

(See MINIMUM HOLDING ALTITUDE.)

MIA–

(See MINIMUM IFR ALTITUDES.)

MICROBURST– A small downburst with outbursts of damaging winds extending 2.5 miles or less. In spite of its small horizontal scale, an intense microburst could induce wind speeds as high as 150 knots

(Refer to AIM.)

MICRO-EN ROUTE AUTOMATED RADAR TRACKING SYSTEM (MEARTS)– An automated radar and radar beacon tracking system capable of employing both short-range (ASR) and long-range (ARSR) radars. This microcomputer driven system provides improved tracking, continuous data recording, and use of full digital radar displays.

MID RVR–

(See VISIBILITY.)

MIDDLE COMPASS LOCATOR–

(See COMPASS LOCATOR.)

MIDDLE MARKER– A marker beacon that defines a point along the glideslope of an ILS normally located at or near the point of decision height (ILS Category I). It is keyed to transmit alternate dots and dashes, with the alternate dots and dashes keyed at the rate of 95 dot/dash combinations per minute on a



1300 Hz tone, which is received aurally and visually by compatible airborne equipment.

(See INSTRUMENT LANDING SYSTEM.)

(See MARKER BEACON.)

(Refer to AIM.)

**MILES-IN-TRAIL**– A specified distance between aircraft, normally, in the same stratum associated with the same destination or route of flight.

**MILITARY AUTHORITY ASSUMES RESPONSIBILITY FOR SEPARATION OF AIRCRAFT (MARSA)**– A condition whereby the military services involved assume responsibility for separation between participating military aircraft in the ATC system. It is used only for required IFR operations which are specified in letters of agreement or other appropriate FAA or military documents.

**MILITARY LANDING ZONE**– A landing strip used exclusively by the military for training. A military landing zone does not carry a runway designation.

**MILITARY OPERATIONS AREA**–

(See SPECIAL USE AIRSPACE.)

**MILITARY TRAINING ROUTES**– Airspace of defined vertical and lateral dimensions established for the conduct of military flight training at airspeeds in excess of 250 knots IAS.

(See IFR MILITARY TRAINING ROUTES.)

(See VFR MILITARY TRAINING ROUTES.)

**MINIMA**–

(See MINIMUMS.)

**MINIMUM CROSSING ALTITUDE (MCA)**– The lowest altitude at certain fixes at which an aircraft must cross when proceeding in the direction of a higher minimum en route IFR altitude (MEA).

(See MINIMUM EN ROUTE IFR ALTITUDE.)

**MINIMUM DESCENT ALTITUDE (MDA)**– The lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glideslope is provided.

(See NONPRECISION APPROACH PROCEDURE.)

**MINIMUM EN ROUTE IFR ALTITUDE (MEA)**– The lowest published altitude between radio fixes

which assures acceptable navigational signal coverage and meets obstacle clearance requirements between those fixes. The MEA prescribed for a Federal airway or segment thereof, area navigation low or high route, or other direct route applies to the entire width of the airway, segment, or route between the radio fixes defining the airway, segment, or route.

(Refer to 14 CFR Part 91.)

(Refer to 14 CFR Part 95.)

(Refer to AIM.)

**MINIMUM FRICTION LEVEL**– The friction level specified in AC 150/5320-12, Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces, that represents the minimum recommended wet pavement surface friction value for any turbojet aircraft engaged in LAHSO. This value will vary with the particular friction measurement equipment used.

**MINIMUM FUEL**– Indicates that an aircraft's fuel supply has reached a state where, upon reaching the destination, it can accept little or no delay. This is not an emergency situation but merely indicates an emergency situation is possible should any undue delay occur.

(Refer to AIM.)

**MINIMUM HOLDING ALTITUDE**– The lowest altitude prescribed for a holding pattern which assures navigational signal coverage, communications, and meets obstacle clearance requirements.

**MINIMUM IFR ALTITUDES (MIA)**– Minimum altitudes for IFR operations as prescribed in 14 CFR Part 91. These altitudes are published on aeronautical charts and prescribed in 14 CFR Part 95 for airways and routes, and in 14 CFR Part 97 for standard instrument approach procedures. If no applicable minimum altitude is prescribed in 14 CFR Part 95 or 14 CFR Part 97, the following minimum IFR altitude applies:

**a.** In designated mountainous areas, 2,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

**b.** Other than mountainous areas, 1,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

c. As otherwise authorized by the Administrator or assigned by ATC.

(See MINIMUM CROSSING ALTITUDE.)

(See MINIMUM EN ROUTE IFR ALTITUDE.)

(See MINIMUM OBSTRUCTION CLEARANCE ALTITUDE.)

(See MINIMUM SAFE ALTITUDE.)

(See MINIMUM VECTORING ALTITUDE.)

(Refer to 14 CFR Part 91.)

**MINIMUM OBSTRUCTION CLEARANCE ALTITUDE (MOCA)**– The lowest published altitude in effect between radio fixes on VOR airways, off-airway routes, or route segments which meets obstacle clearance requirements for the entire route segment and which assures acceptable navigational signal coverage only within 25 statute (22 nautical) miles of a VOR.

(Refer to 14 CFR Part 91.)

(Refer to 14 CFR Part 95.)

**MINIMUM RECEPTION ALTITUDE (MRA)**– The lowest altitude at which an intersection can be determined.

(Refer to 14 CFR Part 95.)

**MINIMUM SAFE ALTITUDE (MSA)**–

a. The minimum altitude specified in 14 CFR Part 91 for various aircraft operations.

b. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance for emergency use. These altitudes will be identified as Minimum Safe Altitudes or Emergency Safe Altitudes and are established as follows:

1. **Minimum Safe Altitude (MSA)**. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance within a 25-mile radius of the navigation facility, waypoint, or airport reference point upon which the MSA is predicated. MSAs are for emergency use only and do not necessarily assure acceptable navigational signal coverage.

(See ICAO term Minimum Sector Altitude.)

2. **Emergency Safe Altitude (ESA)**. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance in nonmountainous areas and 2,000 feet of obstacle clearance in designated mountainous areas within a 100-mile radius of the navigation facility or waypoint used as the ESA center. These altitudes are normally used only in military procedures and are identified on

published procedures as “Emergency Safe Altitudes.”

**MINIMUM SAFE ALTITUDE WARNING (MSAW)**– A function of the ARTS III computer that aids the controller by alerting him/her when a tracked Mode C equipped aircraft is below or is predicted by the computer to go below a predetermined minimum safe altitude.

(Refer to AIM.)

**MINIMUM SECTOR ALTITUDE [ICAO]**– The lowest altitude which may be used under emergency conditions which will provide a minimum clearance of 300 m (1,000 feet) above all obstacles located in an area contained within a sector of a circle of 46 km (25 NM) radius centered on a radio aid to navigation.

**MINIMUMS**– Weather condition requirements established for a particular operation or type of operation; e.g., IFR takeoff or landing, alternate airport for IFR flight plans, VFR flight, etc.

(See IFR CONDITIONS.)

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See LANDING MINIMUMS.)

(See VFR CONDITIONS.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**MINIMUM VECTORING ALTITUDE (MVA)**– The lowest MSL altitude at which an IFR aircraft will be vectored by a radar controller, except as otherwise authorized for radar approaches, departures, and missed approaches. The altitude meets IFR obstacle clearance criteria. It may be lower than the published MEA along an airway or J-route segment. It may be utilized for radar vectoring only upon the controller’s determination that an adequate radar return is being received from the aircraft being controlled. Charts depicting minimum vectoring altitudes are normally available only to the controllers and not to pilots.

(Refer to AIM.)

**MINUTES-IN-TRAIL**– A specified interval between aircraft expressed in time. This method would more likely be utilized regardless of altitude.

**MIS**–

(See METEOROLOGICAL IMPACT STATEMENT.)

**MISSED APPROACH**–

a. A maneuver conducted by a pilot when an instrument approach cannot be completed to a

landing. The route of flight and altitude are shown on instrument approach procedure charts. A pilot executing a missed approach prior to the Missed Approach Point (MAP) must continue along the final approach to the MAP.

**b.** A term used by the pilot to inform ATC that he/she is executing the missed approach.

**c.** At locations where ATC radar service is provided, the pilot should conform to radar vectors when provided by ATC in lieu of the published missed approach procedure.

(See MISSED APPROACH POINT.)

(Refer to AIM.)

**MISSED APPROACH POINT (MAP)**– A point prescribed in each instrument approach procedure at which a missed approach procedure shall be executed if the required visual reference does not exist.

(See MISSED APPROACH.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**MISSED APPROACH PROCEDURE [ICAO]**– The procedure to be followed if the approach cannot be continued.

**MISSED APPROACH SEGMENT**–

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**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 Wave 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.

**NONCOMPOSITE SEPARATION**– Separation in accordance with minima other than the composite separation minimum specified for the area concerned.

**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.)



# O

**OBSTACLE**– An existing object, object of natural growth, or terrain at a fixed geographical location or which may be expected at a fixed location within a prescribed area with reference to which vertical clearance is or must be provided during flight operation.

**OBSTACLE DEPARTURE PROCEDURE (ODP)**– A preplanned instrument flight rule (IFR) departure procedure printed for pilot use in textual or graphic form to provide obstruction clearance via the least onerous route from the terminal area to the appropriate en route structure. ODPs are recommended for obstruction clearance and may be flown without ATC clearance unless an alternate departure procedure (SID or radar vector) has been specifically assigned by ATC.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See STANDARD INSTRUMENT DEPARTURES.)

(Refer to AIM.)

**OBSTACLE FREE ZONE**– The OFZ is a three-dimensional volume of airspace which protects for the transition of aircraft to and from the runway. The OFZ clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible NAVAID locations that are fixed by function. Additionally, vehicles, equipment, and personnel may be authorized by air traffic control to enter the area using the provisions of FAA Order JO 7110.65, Paragraph 3–1–5, Vehicles/Equipment/Personnel Near/On Runways. The runway OFZ and when applicable, the inner-approach OFZ, and the inner-transitional OFZ, comprise the OFZ.

**a. Runway OFZ.** The runway OFZ is a defined volume of airspace centered above the runway. The runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The runway OFZ extends 200 feet beyond each end of the runway. The width is as follows:

**1.** For runways serving large airplanes, the greater of:

**(a)** 400 feet, or

**(b)** 180 feet, plus the wingspan of the most demanding airplane, plus 20 feet per 1,000 feet of airport elevation.

**2.** For runways serving only small airplanes:

**(a)** 300 feet for precision instrument runways.

**(b)** 250 feet for other runways serving small airplanes with approach speeds of 50 knots, or more.

**(c)** 120 feet for other runways serving small airplanes with approach speeds of less than 50 knots.

**b. Inner-approach OFZ.** The inner-approach OFZ is a defined volume of airspace centered on the approach area. The inner-approach OFZ applies only to runways with an approach lighting system. The inner-approach OFZ begins 200 feet from the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the approach lighting system. The width of the inner-approach OFZ is the same as the runway OFZ and rises at a slope of 50 (horizontal) to 1 (vertical) from the beginning.

**c. Inner-transitional OFZ.** The inner transitional surface OFZ is a defined volume of airspace along the sides of the runway and inner-approach OFZ and applies only to precision instrument runways. The inner-transitional surface OFZ slopes 3 (horizontal) to 1 (vertical) out from the edges of the runway OFZ and inner-approach OFZ to a height of 150 feet above the established airport elevation.

(Refer to AC 150/5300-13, Chapter 3.)

(Refer to FAA Order JO 7110.65, Para 3–1–5, Vehicles/Equipment/Personnel Near/On Runways.)

**OBSTRUCTION**– Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, Subpart C.

**OBSTRUCTION LIGHT**– A light or one of a group of lights, usually red or white, frequently mounted on a surface structure or natural terrain to warn pilots of the presence of an obstruction.

**OCEANIC AIRSPACE**– Airspace over the oceans of the world, considered international airspace, where oceanic separation and procedures per the International Civil Aviation Organization are applied. Responsibility for the provisions of air traffic control

service in this airspace is delegated to various countries, based generally upon geographic proximity and the availability of the required resources.

**OCEANIC ERROR REPORT**– A report filed when ATC observes an Oceanic Error as defined by FAA Order 7110.82, Reporting Oceanic Errors.

**OCEANIC PUBLISHED ROUTE**– A route established in international airspace and charted or described in flight information publications, such as Route Charts, DOD En route Charts, Chart Supplements, NOTAMs, and Track Messages.

**OCEANIC TRANSITION ROUTE**– An ATS route established for the purpose of transitioning aircraft to/from an organized track system.

**ODP**–

(See OBSTACLE DEPARTURE PROCEDURE.)

**OFF COURSE**– A term used to describe a situation where an aircraft has reported a position fix or is observed on radar at a point not on the ATC-approved route of flight.

**OFF-ROUTE VECTOR**– A vector by ATC which takes an aircraft off a previously assigned route. Altitudes assigned by ATC during such vectors provide required obstacle clearance.

**OFFSET PARALLEL RUNWAYS**– Staggered runways having centerlines which are parallel.

**OFFSHORE/CONTROL AIRSPACE AREA**– That portion of airspace between the U.S. 12 NM limit and the oceanic CTA/FIR boundary within which air traffic control is exercised. These areas are established to provide air traffic control services. Offshore/Control Airspace Areas may be classified as either Class A airspace or Class E airspace.

**OFT**–

(See OUTER FIX TIME.)

**OM**–

(See OUTER MARKER.)

**ON COURSE**–

a. Used to indicate that an aircraft is established on the route centerline.

b. Used by ATC to advise a pilot making a radar approach that his/her aircraft is lined up on the final approach course.

(See ON-COURSE INDICATION.)

**ON-COURSE INDICATION**– An indication on an instrument, which provides the pilot a visual means of determining that the aircraft is located on the centerline of a given navigational track, or an indication on a radar scope that an aircraft is on a given track.

**ONE-MINUTE WEATHER**– The most recent one minute updated weather broadcast received by a pilot from an uncontrolled airport ASOS/AWSS/AWOS.

**ONER**–

(See OCEANIC NAVIGATIONAL ERROR REPORT.)

**OPERATIONAL**–

(See DUE REGARD.)

**OPERATIONS SPECIFICATIONS [ICAO]**– The authorizations, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

**OPPOSITE DIRECTION AIRCRAFT**– Aircraft are operating in opposite directions when:

a. They are following the same track in reciprocal directions; or

b. Their tracks are parallel and the aircraft are flying in reciprocal directions; or

c. Their tracks intersect at an angle of more than 135°.

**OPTION APPROACH**– An approach requested and conducted by a pilot which will result in either a touch-and-go, missed approach, low approach, stop-and-go, or full stop landing. Pilots should advise ATC if they decide to remain on the runway, of any delay in their stop and go, delay clearing the runway, or are unable to comply with the instruction(s).

(See CLEARED FOR THE OPTION.)

(Refer to AIM.)

**ORGANIZED TRACK SYSTEM**– A series of ATS routes which are fixed and charted; i.e., CEP, NOPAC, or flexible and described by NOTAM; i.e., NAT TRACK MESSAGE.

**OFF-ROUTE OBSTRUCTION CLEARANCE ALTITUDE (OROCA)**– An off-route altitude which provides obstruction clearance with a 1,000 foot buffer in non-mountainous terrain areas and a 2,000 foot buffer in designated mountainous areas within the United States. This altitude may not provide signal coverage from ground-based navigational aids, air traffic control radar, or communications coverage.

**OTR**–

(See OCEANIC TRANSITION ROUTE.)

**OTS**–

(See ORGANIZED TRACK SYSTEM.)

**OUT**– The conversation is ended and no response is expected.

**OUT OF SERVICE**– When a piece of equipment, a system, a facility or a service is not operational, certified (if required) and immediately “available” for Air Traffic or public use.

**OUTER AREA** (associated with Class C airspace)– Non-regulatory airspace surrounding designated Class C airspace airports wherein ATC provides radar vectoring and sequencing on a full-time basis for all IFR and participating VFR aircraft. The service provided in the outer area is called Class C service which includes: IFR/IFR–IFR separation; IFR/VFR–traffic advisories and conflict resolution; and VFR/VFR–traffic advisories and, as appropriate, safety alerts. The normal radius will be 20 nautical miles with some variations based on site-specific requirements. The outer area extends outward from the primary Class C airspace airport and extends from the lower limits of radar/radio coverage up to the ceiling of the approach control’s delegated airspace excluding the Class C charted area and other airspace as appropriate.

(See CONFLICT RESOLUTION.)

(See CONTROLLED AIRSPACE.)

**OUTER COMPASS LOCATOR**–

(See COMPASS LOCATOR.)

**OUTER FIX**– A general term used within ATC to describe fixes in the terminal area, other than the final approach fix. Aircraft are normally cleared to these fixes by an Air Route Traffic Control Center or an Approach Control Facility. Aircraft are normally cleared from these fixes to the final approach fix or final approach course.

**OR**

**OUTER FIX**– An adapted fix along the converted route of flight, prior to the meter fix, for which crossing times are calculated and displayed in the metering position list.

**OUTER FIX ARC**– A semicircle, usually about a 50–70 mile radius from a meter fix, usually in high altitude, which is used by CTAS/ERAM to calculate outer fix times and determine appropriate sector meter list assignments for aircraft on an established arrival route that will traverse the arc.

**OUTER FIX TIME**– A calculated time to depart the outer fix in order to cross the vertex at the ACLT. The time reflects descent speed adjustments and any applicable delay time that must be absorbed prior to crossing the meter fix.

**OUTER MARKER**– A marker beacon at or near the glideslope intercept altitude of an ILS approach. It is keyed to transmit two dashes per second on a 400 Hz tone, which is received aurally and visually by compatible airborne equipment. The OM is normally located four to seven miles from the runway threshold on the extended centerline of the runway.

(See INSTRUMENT LANDING SYSTEM.)

(See MARKER BEACON.)

(Refer to AIM.)

**OVER**– My transmission is ended; I expect a response.

**OVERHEAD MANEUVER**– A series of predetermined maneuvers prescribed for aircraft (often in formation) for entry into the visual flight rules (VFR) traffic pattern and to proceed to a landing. An overhead maneuver is not an instrument flight rules (IFR) approach procedure. An aircraft executing an overhead maneuver is considered VFR and the IFR flight plan is cancelled when the aircraft reaches the “initial point” on the initial approach portion of the maneuver. The pattern usually specifies the following:

- a. The radio contact required of the pilot.
- b. The speed to be maintained.
- c. An initial approach 3 to 5 miles in length.
- d. An elliptical pattern consisting of two 180 degree turns.
- e. A break point at which the first 180 degree turn is started.
- f. The direction of turns.

**g.** Altitude (at least 500 feet above the conventional pattern).

**h.** A “Roll-out” on final approach not less than 1/4 mile from the landing threshold and not less than 300 feet above the ground.

**OVERLYING CENTER**– The ARTCC facility that is responsible for arrival/departure operations at a specific terminal.

# P

**P TIME–**

(See PROPOSED DEPARTURE TIME.)

**P-ACP–**

(See PREARRANGED COORDINATION PROCEDURES.)

**PAN-PAN–** The international radio-telephony urgency signal. When repeated three times, indicates uncertainty or alert followed by the nature of the urgency.

(See MAYDAY.)

(Refer to AIM.)

**PAR–**

(See PRECISION APPROACH RADAR.)

**PAR [ICAO]–**

(See ICAO Term PRECISION APPROACH RADAR.)

**PARALLEL ILS APPROACHES–** Approaches to parallel runways by IFR aircraft which, when established inbound toward the airport on the adjacent final approach courses, are radar-separated by at least 2 miles.

(See FINAL APPROACH COURSE.)

(See SIMULTANEOUS ILS APPROACHES.)

**PARALLEL OFFSET ROUTE–** A parallel track to the left or right of the designated or established airway/route. Normally associated with Area Navigation (RNAV) operations.

(See AREA NAVIGATION.)

**PARALLEL RUNWAYS–** Two or more runways at the same airport whose centerlines are parallel. In addition to runway number, parallel runways are designated as L (left) and R (right) or, if three parallel runways exist, L (left), C (center), and R (right).

**PBCT–**

(See PROPOSED BOUNDARY CROSSING TIME.)

**PBN–**

(See ICAO Term PERFORMANCE-BASED NAVIGATION.)

**PDC–**

(See PRE-DEPARTURE CLEARANCE.)

**PERFORMANCE-BASED NAVIGATION (PBN) [ICAO]–** Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

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

**PERMANENT ECHO–** Radar signals reflected from fixed objects on the earth's surface; e.g., buildings, towers, terrain. Permanent echoes are distinguished from "ground clutter" by being definable locations rather than large areas. Under certain conditions they may be used to check radar alignment.

**PHOTO RECONNAISSANCE–** Military activity that requires locating individual photo targets and navigating to the targets at a preplanned angle and altitude. The activity normally requires a lateral route width of 16 NM and altitude range of 1,500 feet to 10,000 feet AGL.

**PILOT BRIEFING–** A service provided by the FSS to assist pilots in flight planning. Briefing items may include weather information, NOTAMS, military activities, flow control information, and other items as requested.

(Refer to AIM.)

**PILOT IN COMMAND–** The pilot responsible for the operation and safety of an aircraft during flight time.

(Refer to 14 CFR Part 91.)

**PILOT WEATHER REPORT–** A report of meteorological phenomena encountered by aircraft in flight.

(Refer to AIM.)

**PILOT'S DISCRETION–** When used in conjunction with altitude assignments, means that ATC has offered the pilot the option of starting climb or descent whenever he/she wishes and conducting the climb or descent at any rate he/she wishes. He/she may temporarily level off at any intermediate altitude. However, once he/she has vacated an altitude, he/she may not return to that altitude.

**PIREP–**

(See PILOT WEATHER REPORT.)

**PITCH POINT–** A fix/waypoint that serves as a transition point from a departure procedure or the low altitude ground-based navigation structure into the high altitude waypoint system.

**PLANS DISPLAY–** A display available in EDST that provides detailed flight plan and predicted conflict information in textual format for requested Current Plans and all Trial Plans.

(See EN ROUTE DECISION SUPPORT TOOL)

**POFZ–**

(See PRECISION OBSTACLE FREE ZONE.)

**POINT OUT–**

(See RADAR POINT OUT.)

**POINT-TO-POINT (PTP)–** A level of NRR service for aircraft that is based on traditional waypoints in their FMSs or RNAV equipage.

**POLAR TRACK STRUCTURE–** A system of organized routes between Iceland and Alaska which overlie Canadian MNPS Airspace.

**POSITION REPORT–** A report over a known location as transmitted by an aircraft to ATC.

(Refer to AIM.)

**POSITION SYMBOL–** A computer-generated indication shown on a radar display to indicate the mode of tracking.

**POSITIVE CONTROL–** The separation of all air traffic within designated airspace by air traffic control.

**PRACTICE INSTRUMENT APPROACH–** An instrument approach procedure conducted by a VFR or an IFR aircraft for the purpose of pilot training or proficiency demonstrations.

**PRE-DEPARTURE CLEARANCE–** An application with the Terminal Data Link System (TDLS) that provides clearance information to subscribers, through a service provider, in text to the cockpit or gate printer.

**PREARRANGED COORDINATION–** A standardized procedure which permits an air traffic controller to enter the airspace assigned to another air traffic controller without verbal coordination. The procedures are defined in a facility directive which ensures approved separation between aircraft.

**PREARRANGED COORDINATION PROCEDURES–** A facility's standardized procedure that describes the process by which one controller shall allow an aircraft to penetrate or transit another controller's airspace in a manner that assures approved separation without individual coordination for each aircraft.

**PRECIPITATION–** Any or all forms of water particles (rain, sleet, hail, or snow) that fall from the atmosphere and reach the surface.

**PRECIPITATION RADAR WEATHER DESCRIPTIONS–** Existing radar systems cannot detect turbulence. However, there is a direct correlation between the degree of turbulence and other weather features associated with thunderstorms and the weather radar precipitation intensity. Controllers will issue (where capable) precipitation intensity as observed by radar when using weather and radar processor (WARP) or NAS ground-based digital radars with weather capabilities. When precipitation intensity information is not available, the intensity will be described as UNKNOWN. When intensity levels can be determined, they shall be described as:

- a. LIGHT (< 26 dBZ)
- b. MODERATE (26 to 40 dBZ)
- c. HEAVY (> 40 to 50 dBZ)
- d. EXTREME (> 50 dBZ)

(Refer to AC 00-45, Aviation Weather Services.)

**PRECISION APPROACH–**

(See PRECISION APPROACH PROCEDURE.)

**PRECISION APPROACH PROCEDURE–** A standard instrument approach procedure in which an electronic glideslope or other type of glidepath is provided; e.g., ILS, PAR, and GLS.

(See INSTRUMENT LANDING SYSTEM.)

(See PRECISION APPROACH RADAR.)

**PRECISION APPROACH RADAR**– Radar equipment in some ATC facilities operated by the FAA and/or the military services at joint-use civil/military locations and separate military installations to detect and display azimuth, elevation, and range of aircraft on the final approach course to a runway. This equipment may be used to monitor certain non-radar approaches, but is primarily used to conduct a precision instrument approach (PAR) wherein the controller issues guidance instructions to the pilot based on the aircraft's position in relation to the final approach course (azimuth), the glidepath (elevation), and the distance (range) from the touchdown point on the runway as displayed on the radar scope.

Note: The abbreviation "PAR" is also used to denote preferential arrival routes in ARTCC computers.

(See GLIDEPATH.)

(See PAR.)

(See PREFERENTIAL ROUTES.)

(See ICAO term PRECISION APPROACH RADAR.)

(Refer to AIM.)

**PRECISION APPROACH RADAR [ICAO]**– Primary radar equipment used to determine the position of an aircraft during final approach, in terms of lateral and vertical deviations relative to a nominal approach path, and in range relative to touchdown.

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

**PRECISION OBSTACLE FREE ZONE (POFZ)**– An 800 foot wide by 200 foot long area centered on the runway centerline adjacent to the threshold designed to protect aircraft flying precision approaches from ground vehicles and other aircraft when ceiling is less than 250 feet or visibility is less than 3/4 statute mile (or runway visual range below 4,000 feet.)

**PRECISION RUNWAY MONITOR (PRM) SYSTEM**– Provides air traffic controllers monitoring the NTZ during simultaneous close parallel PRM approaches with precision, high update rate secondary surveillance data. The high update rate surveillance sensor component of the PRM system is only required for specific runway or approach course separation. The high resolution color monitoring display, Final Monitor Aid (FMA) of the PRM

system, or other FMA with the same capability, presents NTZ surveillance track data to controllers along with detailed maps depicting approaches and no transgression zone and is required for all simultaneous close parallel PRM NTZ monitoring operations.

(Refer to AIM)

**PREDICTIVE WIND SHEAR ALERT SYSTEM (PWS)**– A self-contained system used on board some aircraft to alert the flight crew to the presence of a potential wind shear. PWS systems typically monitor 3 miles ahead and 25 degrees left and right of the aircraft's heading at or below 1200' AGL. Departing flights may receive a wind shear alert after they start the takeoff roll and may elect to abort the takeoff. Aircraft on approach receiving an alert may elect to go around or perform a wind shear escape maneuver.

**PREFERENTIAL ROUTES**– Preferential routes (PDRs, PARs, and PDARs) are adapted in ARTCC computers to accomplish inter/intrafacility controller coordination and to assure that flight data is posted at the proper control positions. Locations having a need for these specific inbound and outbound routes normally publish such routes in local facility bulletins, and their use by pilots minimizes flight plan route amendments. When the workload or traffic situation permits, controllers normally provide radar vectors or assign requested routes to minimize circuitous routing. Preferential routes are usually confined to one ARTCC's area and are referred to by the following names or acronyms:

**a. Preferential Departure Route (PDR).** A specific departure route from an airport or terminal area to an en route point where there is no further need for flow control. It may be included in an Instrument Departure Procedure (DP) or a Preferred IFR Route.

**b. Preferential Arrival Route (PAR).** A specific arrival route from an appropriate en route point to an airport or terminal area. It may be included in a Standard Terminal Arrival (STAR) or a Preferred IFR Route. The abbreviation "PAR" is used primarily within the ARTCC and should not be confused with the abbreviation for Precision Approach Radar.

**c. Preferential Departure and Arrival Route (PDAR).** A route between two terminals which are within or immediately adjacent to one ARTCC's area. PDARs are not synonymous with Preferred IFR Routes but may be listed as such as they do accomplish essentially the same purpose.

(See PREFERRED IFR ROUTES.)

**PREFERRED IFR ROUTES**– Routes established between busier airports to increase system efficiency and capacity. They normally extend through one or more ARTCC areas and are designed to achieve balanced traffic flows among high density terminals. IFR clearances are issued on the basis of these routes except when severe weather avoidance procedures or other factors dictate otherwise. Preferred IFR Routes are listed in the Chart Supplement U.S. If a flight is planned to or from an area having such routes but the departure or arrival point is not listed in the Chart Supplement U.S., pilots may use that part of a Preferred IFR Route which is appropriate for the departure or arrival point that is listed. Preferred IFR Routes are correlated with DPs and STARs and may be defined by airways, jet routes, direct routes between NAVAIDs, Waypoints, NAVAID radials/DME, or any combinations thereof.

(See CENTER'S AREA.)

(See INSTRUMENT DEPARTURE PROCEDURE.)

(See PREFERENTIAL ROUTES.)

(See STANDARD TERMINAL ARRIVAL.)

(Refer to CHART SUPPLEMENT U.S.)

(Refer to NOTICES TO AIRMEN PUBLICATION.)

**PRE-FLIGHT PILOT BRIEFING**–

(See PILOT BRIEFING.)

**PREVAILING VISIBILITY**–

(See VISIBILITY.)

**PRIMARY RADAR TARGET**– An analog or digital target, exclusive of a secondary radar target, presented on a radar display.

**PRM**–

(See ILS PRM APPROACH and PRECISION RUNWAY MONITOR SYSTEM.)

**PROCEDURAL CONTROL [ICAO]**– Term used to indicate that information derived from an ATS surveillance system is not required for the provision of air traffic control service.

**PROCEDURAL SEPARATION [ICAO]**– The separation used when providing procedural control.

**PROCEDURE TURN**– The maneuver prescribed when it is necessary to reverse direction to establish an aircraft on the intermediate approach segment or final approach course. The outbound course, direction of turn, distance within which the turn must be completed, and minimum altitude are specified in

the procedure. However, unless otherwise restricted, the point at which the turn may be commenced and the type and rate of turn are left to the discretion of the pilot.

(See ICAO term PROCEDURE TURN.)

**PROCEDURE TURN [ICAO]**– A maneuver in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.

Note 1: Procedure turns are designated “left” or “right” according to the direction of the initial turn.

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

**PROCEDURE TURN INBOUND**– That point of a procedure turn maneuver where course reversal has been completed and an aircraft is established inbound on the intermediate approach segment or final approach course. A report of “procedure turn inbound” is normally used by ATC as a position report for separation purposes.

(See FINAL APPROACH COURSE.)

(See PROCEDURE TURN.)

(See SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE.)

**PROFILE DESCENT**– An uninterrupted descent (except where level flight is required for speed adjustment; e.g., 250 knots at 10,000 feet MSL) from cruising altitude/level to interception of a glideslope or to a minimum altitude specified for the initial or intermediate approach segment of a nonprecision instrument approach. The profile descent normally terminates at the approach gate or where the glideslope or other appropriate minimum altitude is intercepted.

**PROGRESS REPORT**–

(See POSITION REPORT.)

**PROGRESSIVE TAXI**– Precise taxi instructions given to a pilot unfamiliar with the airport or issued in stages as the aircraft proceeds along the taxi route.

**PROHIBITED AREA**–

(See SPECIAL USE AIRSPACE.)

(See ICAO term PROHIBITED AREA.)

**PROHIBITED AREA [ICAO]**– An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.



**PROMINENT OBSTACLE**– An obstacle that meets one or more of the following conditions:

**a.** An obstacle which stands out beyond the adjacent surface of surrounding terrain and immediately projects a noticeable hazard to aircraft in flight.

**b.** An obstacle, not characterized as low and close in, whose height is no less than 300 feet above the departure end of takeoff runway (DER) elevation, is within 10NM from the DER, and that penetrates that airport/heliport's diverse departure obstacle clearance surface (OCS).

**c.** An obstacle beyond 10NM from an airport/heliport that requires an obstacle departure procedure (ODP) to ensure obstacle avoidance.

(See OBSTACLE.)

(See OBSTRUCTION.)

**PROPOSED BOUNDARY CROSSING TIME**– Each center has a PBCT parameter for each internal airport. Proposed internal flight plans are transmitted to the adjacent center if the flight time along the proposed route from the departure airport to the center boundary is less than or equal to the value of PBCT or if airport adaptation specifies transmission regardless of PBCT.

**PROPOSED DEPARTURE TIME**– The time that the aircraft expects to become airborne.

**PROTECTED AIRSPACE**– The airspace on either side of an oceanic route/track that is equal to one-half

the lateral separation minimum except where reduction of protected airspace has been authorized.

**PROTECTED SEGMENT**– The protected segment is a segment on the amended TFM route that is to be inhibited from automatic adapted route alteration by ERAM.

**PT**–

(See PROCEDURE TURN.)

**PTP**–

(See POINT-TO-POINT.)

**PTS**–

(See POLAR TRACK STRUCTURE.)

**PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT**– A segment on an IAP chart annotated as “Fly Visual to Airport” or “Fly Visual.” A dashed arrow will indicate the visual flight path on the profile and plan view with an associated note on the approximate heading and distance. The visual segment should be flown as a dead reckoning course while maintaining visual conditions.

**PUBLISHED ROUTE**– A route for which an IFR altitude has been established and published; e.g., Federal Airways, Jet Routes, Area Navigation Routes, Specified Direct Routes.

**PWS**–

(See PREDICTIVE WIND SHEAR ALERT SYSTEM.)



# Q

**Q ROUTE**– ‘Q’ is the designator assigned to published RNAV routes used by the United States.

**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.



# R

**RADAR**– A device which, by measuring the time interval between transmission and reception of radio pulses and correlating the angular orientation of the radiated antenna beam or beams in azimuth and/or elevation, provides information on range, azimuth, and/or elevation of objects in the path of the transmitted pulses.

**a. Primary Radar**– A radar system in which a minute portion of a radio pulse transmitted from a site is reflected by an object and then received back at that site for processing and display at an air traffic control facility.

**b. Secondary Radar/Radar Beacon (ATCRBS)**– A radar system in which the object to be detected is fitted with cooperative equipment in the form of a radio receiver/transmitter (transponder). Radar pulses transmitted from the searching transmitter/receiver (interrogator) site are received in the cooperative equipment and used to trigger a distinctive transmission from the transponder. This reply transmission, rather than a reflected signal, is then received back at the transmitter/receiver site for processing and display at an air traffic control facility.

(See INTERROGATOR.)

(See TRANSPONDER.)

(See ICAO term RADAR.)

(Refer to AIM.)

**RADAR [ICAO]**– A radio detection device which provides information on range, azimuth and/or elevation of objects.

**a. Primary Radar**– Radar system which uses reflected radio signals.

**b. Secondary Radar**– Radar system wherein a radio signal transmitted from a radar station initiates the transmission of a radio signal from another station.

**RADAR ADVISORY**– The provision of advice and information based on radar observations.

(See ADVISORY SERVICE.)

**RADAR ALTIMETER**–

(See RADIO ALTIMETER.)

**RADAR APPROACH**– An instrument approach procedure which utilizes Precision Approach Radar (PAR) or Airport Surveillance Radar (ASR).

(See AIRPORT SURVEILLANCE RADAR.)

(See INSTRUMENT APPROACH PROCEDURE.)

(See PRECISION APPROACH RADAR.)

(See SURVEILLANCE APPROACH.)

(See ICAO term RADAR APPROACH.)

(Refer to AIM.)

**RADAR APPROACH [ICAO]**– An approach, executed by an aircraft, under the direction of a radar controller.

**RADAR APPROACH CONTROL FACILITY**– A terminal ATC facility that uses radar and nonradar capabilities to provide approach control services to aircraft arriving, departing, or transiting airspace controlled by the facility.

(See APPROACH CONTROL SERVICE.)

**a. Provides radar ATC services to aircraft operating in the vicinity of one or more civil and/or military airports in a terminal area.** The facility may provide services of a ground controlled approach (GCA); i.e., ASR and PAR approaches. A radar approach control facility may be operated by FAA, USAF, US Army, USN, USMC, or jointly by FAA and a military service. Specific facility nomenclatures are used for administrative purposes only and are related to the physical location of the facility and the operating service generally as follows:

**1. Army Radar Approach Control (ARAC)** (Army).

**2. Radar Air Traffic Control Facility (RATCF)** (Navy/FAA).

**3. Radar Approach Control (RAPCON)** (Air Force/FAA).

**4. Terminal Radar Approach Control (TRACON)** (FAA).

**5. Air Traffic Control Tower (ATCT)** (FAA). (Only those towers delegated approach control authority.)

**RADAR ARRIVAL**– An aircraft arriving at an airport served by a radar facility and in radar contact with the facility.

(See NONRADAR.)

**RADAR BEACON–**

(See RADAR.)

**RADAR CLUTTER [ICAO]–** The visual indication on a radar display of unwanted signals.

***RADAR CONTACT–***

**a.** Used by ATC to inform an aircraft that it is identified using an approved ATC surveillance source on an air traffic controller's display and that radar flight following will be provided until radar service is terminated. Radar service may also be provided within the limits of necessity and capability. When a pilot is informed of "radar contact," he/she automatically discontinues reporting over compulsory reporting points.

(See ATC SURVEILLANCE SOURCE.)

(See RADAR CONTACT LOST.)

(See RADAR FLIGHT FOLLOWING.)

(See RADAR SERVICE.)

(See RADAR SERVICE TERMINATED.)

(Refer to AIM.)

**b.** The term used to inform the controller that the aircraft is identified and approval is granted for the aircraft to enter the receiving controllers airspace.

(See ICAO term RADAR CONTACT.)

**RADAR CONTACT [ICAO]–** The situation which exists when the radar blip or radar position symbol of a particular aircraft is seen and identified on a radar display.

***RADAR CONTACT LOST–*** Used by ATC to inform a pilot that the surveillance data used to determine the aircraft's position is no longer being received, or is no longer reliable and radar service is no longer being provided. The loss may be attributed to several factors including the aircraft merging with weather or ground clutter, the aircraft operating below radar line of sight coverage, the aircraft entering an area of poor radar return, failure of the aircraft's equipment, or failure of the surveillance equipment.

(See CLUTTER.)

(See RADAR CONTACT.)

**RADAR ENVIRONMENT–** An area in which radar service may be provided.

(See ADDITIONAL SERVICES.)

(See RADAR CONTACT.)

(See RADAR SERVICE.)

(See TRAFFIC ADVISORIES.)

**RADAR FLIGHT FOLLOWING–** The observation of the progress of radar-identified aircraft, whose primary navigation is being provided by the pilot, wherein the controller retains and correlates the aircraft identity with the appropriate target or target symbol displayed on the radar scope.

(See RADAR CONTACT.)

(See RADAR SERVICE.)

(Refer to AIM.)

**RADAR IDENTIFICATION–** The process of ascertaining that an observed radar target is the radar return from a particular aircraft.

(See RADAR CONTACT.)

(See RADAR SERVICE.)

**RADAR IDENTIFIED AIRCRAFT–** An aircraft, the position of which has been correlated with an observed target or symbol on the radar display.

(See RADAR CONTACT.)

(See RADAR CONTACT LOST.)

**RADAR MONITORING–**

(See RADAR SERVICE.)

**RADAR NAVIGATIONAL GUIDANCE–**

(See RADAR SERVICE.)

**RADAR POINT OUT–** An action taken by a controller to transfer the radar identification of an aircraft to another controller if the aircraft will or may enter the airspace or protected airspace of another controller and radio communications will not be transferred.

**RADAR REQUIRED–** A term displayed on charts and approach plates and included in FDC NOTAMS to alert pilots that segments of either an instrument approach procedure or a route are not navigable because of either the absence or unusability of a NAVAID. The pilot can expect to be provided radar navigational guidance while transiting segments labeled with this term.

(See RADAR ROUTE.)

(See RADAR SERVICE.)

**RADAR ROUTE–** A flight path or route over which an aircraft is vectored. Navigational guidance and altitude assignments are provided by ATC.

(See FLIGHT PATH.)

(See ROUTE.)

**RADAR SEPARATION–**

(See RADAR SERVICE.)

**RADAR SERVICE–** A term which encompasses one or more of the following services based on the use of

radar which can be provided by a controller to a pilot of a radar identified aircraft.

**a. Radar Monitoring**– The radar flight-following of aircraft, whose primary navigation is being performed by the pilot, to observe and note deviations from its authorized flight path, airway, or route. When being applied specifically to radar monitoring of instrument approaches; i.e., with precision approach radar (PAR) or radar monitoring of simultaneous ILS, RNAV and GLS approaches, it includes advice and instructions whenever an aircraft nears or exceeds the prescribed PAR safety limit or simultaneous ILS RNAV and GLS no transgression zone.

(See ADDITIONAL SERVICES.)

(See TRAFFIC ADVISORIES.)

**b. Radar Navigational Guidance**– Vectoring aircraft to provide course guidance.

**c. Radar Separation**– Radar spacing of aircraft in accordance with established minima.

(See ICAO term RADAR SERVICE.)

**RADAR SERVICE [ICAO]**– Term used to indicate a service provided directly by means of radar.

**a. Monitoring**– The use of radar for the purpose of providing aircraft with information and advice relative to significant deviations from nominal flight path.

**b. Separation**– The separation used when aircraft position information is derived from radar sources.

***RADAR SERVICE TERMINATED***– Used by ATC to inform a pilot that he/she will no longer be provided any of the services that could be received while in radar contact. Radar service is automatically terminated, and the pilot is not advised in the following cases:

**a.** An aircraft cancels its IFR flight plan, except within Class B airspace, Class C airspace, a TRSA, or where Basic Radar service is provided.

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

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

**d.** An aircraft completes a radar approach.

**RADAR SURVEILLANCE**– The radar observation of a given geographical area for the purpose of performing some radar function.

**RADAR TRAFFIC ADVISORIES**– Advisories issued to alert pilots to known or observed radar traffic which may affect the intended route of flight of their aircraft.

(See TRAFFIC ADVISORIES.)

**RADAR TRAFFIC INFORMATION SERVICE**–

(See TRAFFIC ADVISORIES.)

**RADAR VECTORING [ICAO]**– Provision of navigational guidance to aircraft in the form of specific headings, based on the use of radar.

**RADIAL**– A magnetic bearing extending from a VOR/VORTAC/TACAN navigation facility.

**RADIO**–

**a.** A device used for communication.

**b.** Used to refer to a flight service station; e.g., “Seattle Radio” is used to call Seattle FSS.

**RADIO ALTIMETER**– Aircraft equipment which makes use of the reflection of radio waves from the ground to determine the height of the aircraft above the surface.

**RADIO BEACON**–

(See NONDIRECTIONAL BEACON.)

**RADIO DETECTION AND RANGING**–

(See RADAR.)

**RADIO MAGNETIC INDICATOR**– An aircraft navigational instrument coupled with a gyro compass or similar compass that indicates the direction of a selected NAVAID and indicates bearing with respect to the heading of the aircraft.

**RAIS**–

(See REMOTE AIRPORT INFORMATION SERVICE.)

**RAMP**–

(See APRON.)

**RANDOM ALTITUDE**– An altitude inappropriate for direction of flight and/or not in accordance with FAA Order JO 7110.65, Paragraph 4–5–1, VERTICAL SEPARATION MINIMA.

**RANDOM ROUTE**– Any route not established or charted/published or not otherwise available to all users.

**RC**–

(See ROAD RECONNAISSANCE.)

**RCAG–**

(See REMOTE COMMUNICATIONS AIR/GROUND FACILITY.)

**RCC–**

(See RESCUE COORDINATION CENTER.)

**RCO–**

(See REMOTE COMMUNICATIONS OUTLET.)

**RCR–**

(See RUNWAY CONDITION READING.)

**READ BACK–** Repeat my message back to me.

**RECEIVER AUTONOMOUS INTEGRITY MONITORING (RAIM)–** A technique whereby a civil GNSS receiver/processor determines the integrity of the GNSS navigation signals without reference to sensors or non-DoD integrity systems other than the receiver itself. This determination is achieved by a consistency check among redundant pseudorange measurements.

**RECEIVING CONTROLLER–** A controller/facility receiving control of an aircraft from another controller/facility.

**RECEIVING FACILITY–**

(See RECEIVING CONTROLLER.)

**RECONFORMANCE–** The automated process of bringing an aircraft's Current Plan Trajectory into conformance with its track.

**REDUCE SPEED TO (SPEED)–**

(See SPEED ADJUSTMENT.)

**REIL–**

(See RUNWAY END IDENTIFIER LIGHTS.)

**RELEASE TIME–** A departure time restriction issued to a pilot by ATC (either directly or through an authorized relay) when necessary to separate a departing aircraft from other traffic.

(See ICAO term RELEASE TIME.)

**RELEASE TIME [ICAO]–** Time prior to which an aircraft should be given further clearance or prior to which it should not proceed in case of radio failure.

**REMOTE AIRPORT INFORMATION SERVICE (RAIS)–** A temporary service provided by facilities, which are not located on the landing airport, but have communication capability and automated weather reporting available to the pilot at the landing airport.

**REMOTE COMMUNICATIONS AIR/GROUND FACILITY–** An unmanned VHF/UHF transmitter/receiver facility which is used to expand ARTCC air/ground communications coverage and to facilitate direct contact between pilots and controllers. RCAG facilities are sometimes not equipped with emergency frequencies 121.5 MHz and 243.0 MHz.

(Refer to AIM.)

**REMOTE COMMUNICATIONS OUTLET (RCO)–** An unmanned communications facility remotely controlled by air traffic personnel. RCOs serve FSSs. Remote Transmitter/Receivers (RTR) serve terminal ATC facilities. An RCO or RTR may be UHF or VHF and will extend the communication range of the air traffic facility. There are several classes of RCOs and RTRs. The class is determined by the number of transmitters or receivers. Classes A through G are used primarily for air/ground purposes. RCO and RTR class O facilities are nonprotected outlets subject to undetected and prolonged outages. RCO (O's) and RTR (O's) were established for the express purpose of providing ground-to-ground communications between air traffic control specialists and pilots located at a satellite airport for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times. As a secondary function, they may be used for advisory purposes whenever the aircraft is below the coverage of the primary air/ground frequency.

**REMOTE TRANSMITTER/RECEIVER (RTR)–**

(See REMOTE COMMUNICATIONS OUTLET.)

**REPORT–** Used to instruct pilots to advise ATC of specified information; e.g., "Report passing Hamilton VOR."

**REPORTING POINT–** A geographical location in relation to which the position of an aircraft is reported.

(See COMPULSORY REPORTING POINTS.)

(See ICAO term REPORTING POINT.)

(Refer to AIM.)

**REPORTING POINT [ICAO]–** A specified geographical location in relation to which the position of an aircraft can be reported.

**REQUEST FULL ROUTE CLEARANCE–** Used by pilots to request that the entire route of flight be read verbatim in an ATC clearance. Such request should be made to preclude receiving an ATC clearance based on the original filed flight plan when



a filed IFR flight plan has been revised by the pilot, company, or operations prior to departure.

**REQUIRED NAVIGATION PERFORMANCE (RNP)**– A statement of the navigational performance necessary for operation within a defined airspace. The following terms are commonly associated with RNP:

**a. Required Navigation Performance Level or Type (RNP-X).** A value, in nautical miles (NM), from the intended horizontal position within which an aircraft would be at least 95-percent of the total flying time.

**b. Required Navigation Performance (RNP) Airspace.** A generic term designating airspace, route(s), leg(s), operation(s), or procedure(s) where minimum required navigational performance (RNP) have been established.

**c. Actual Navigation Performance (ANP).** A measure of the current estimated navigational performance. Also referred to as Estimated Position Error (EPE).

**d. Estimated Position Error (EPE).** A measure of the current estimated navigational performance. Also referred to as Actual Navigation Performance (ANP).

**e. Lateral Navigation (LNAV).** A function of area navigation (RNAV) equipment which calculates, displays, and provides lateral guidance to a profile or path.

**f. Vertical Navigation (VNAV).** A function of area navigation (RNAV) equipment which calculates, displays, and provides vertical guidance to a profile or path.

**RESCUE COORDINATION CENTER (RCC)**– A search and rescue (SAR) facility equipped and manned to coordinate and control SAR operations in an area designated by the SAR plan. The U.S. Coast Guard and the U.S. Air Force have responsibility for the operation of RCCs.

(See ICAO term **RESCUE CO-ORDINATION CENTRE**.)

**RESCUE CO-ORDINATION CENTRE [ICAO]**– A unit responsible for promoting efficient organization of search and rescue service and for coordinating the conduct of search and rescue operations within a search and rescue region.

**RESOLUTION ADVISORY**– A display indication given to the pilot by the Traffic alert and Collision

Avoidance System (TCAS II) recommending a maneuver to increase vertical separation relative to an intruding aircraft. Positive, negative, and vertical speed limit (VSL) advisories constitute the resolution advisories. A resolution advisory is also classified as corrective or preventive.

**RESTRICTED AREA**–

(See **SPECIAL USE AIRSPACE**.)

(See ICAO term **RESTRICTED AREA**.)

**RESTRICTED AREA [ICAO]**– An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

**RESUME NORMAL SPEED**– Used by ATC to advise a pilot to resume an aircraft's normal operating speed. It is issued to terminate a speed adjustment where no published speed restrictions apply. It does not delete speed restrictions in published procedures of upcoming segments of flight. This does not relieve the pilot of those speed restrictions that are applicable to 14 CFR Section 91.117.

**RESUME OWN NAVIGATION**– Used by ATC to advise a pilot to resume his/her own navigational responsibility. It is issued after completion of a radar vector or when radar contact is lost while the aircraft is being radar vectored.

(See **RADAR CONTACT LOST**.)

(See **RADAR SERVICE TERMINATED**.)

**RESUME PUBLISHED SPEED**– Used by ATC to advise a pilot to resume published speed restrictions that are applicable to a SID, STAR, or other instrument procedure. It is issued to terminate a speed adjustment where speed restrictions are published on a charted procedure.

**RMI**–

(See **RADIO MAGNETIC INDICATOR**.)

**RNAV**–

(See **AREA NAVIGATION (RNAV)**.)

**RNAV APPROACH**– An instrument approach procedure which relies on aircraft area navigation equipment for navigational guidance.

(See **AREA NAVIGATION (RNAV)**.)

(See **INSTRUMENT APPROACH PROCEDURE**.)

**ROAD RECONNAISSANCE (RC)**– Military activity requiring navigation along roads, railroads, and

ivers. Reconnaissance route/route segments are seldom along a straight line and normally require a lateral route width of 10 NM to 30 NM and an altitude range of 500 feet to 10,000 feet AGL.

**ROGER**– I have received all of your last transmission. It should not be used to answer a question requiring a yes or a no answer.

(See AFFIRMATIVE.)

(See NEGATIVE.)

**ROLLOUT RVR**–

(See VISIBILITY.)

**ROUTE**– A defined path, consisting of one or more courses in a horizontal plane, which aircraft traverse over the surface of the earth.

(See AIRWAY.)

(See JET ROUTE.)

(See PUBLISHED ROUTE.)

(See UNPUBLISHED ROUTE.)

**ROUTE ACTION NOTIFICATION**– EDST notification that a PAR/PDR/PDAR has been applied to the flight plan.

(See ATC PREFERRED ROUTE NOTIFICATION.)

(See EN ROUTE DECISION SUPPORT TOOL.)

**ROUTE SEGMENT**– As used in Air Traffic Control, a part of a route that can be defined by two navigational fixes, two NAVAIDs, or a fix and a NAVAID.

(See FIX.)

(See ROUTE.)

(See ICAO term ROUTE SEGMENT.)

**ROUTE SEGMENT [ICAO]**– A portion of a route to be flown, as defined by two consecutive significant points specified in a flight plan.

**RSA**–

(See RUNWAY SAFETY AREA.)

**RTR**–

(See REMOTE TRANSMITTER/RECEIVER.)

**RUNWAY**– A defined rectangular area on a land airport prepared for the landing and takeoff run of aircraft along its length. Runways are normally numbered in relation to their magnetic direction rounded off to the nearest 10 degrees; e.g., Runway 1, Runway 25.

(See PARALLEL RUNWAYS.)

(See ICAO term RUNWAY.)

**RUNWAY [ICAO]**– A defined rectangular area on a land aerodrome prepared for the landing and takeoff of aircraft.

**RUNWAY CENTERLINE LIGHTING**–

(See AIRPORT LIGHTING.)

**RUNWAY CONDITION CODES (RwyCC)**– Numerical readings, provided by airport operators, that indicate runway surface contamination (for example, slush, ice, rain, etc.). These values range from “1” (poor) to “6” (dry) and must be included on the ATIS when the reportable condition is less than 6 in any one or more of the three runway zones (touchdown, midpoint, rollout).

**RUNWAY CONDITION READING**– Numerical decelerometer readings relayed by air traffic controllers at USAF and certain civil bases for use by the pilot in determining runway braking action. These readings are routinely relayed only to USAF and Air National Guard Aircraft.

(See BRAKING ACTION.)

**RUNWAY CONDITION REPORT (RwyCR)**– A data collection worksheet used by airport operators that correlates the runway percentage of coverage along with the depth and type of contaminant for the purpose of creating a FICON NOTAM.

(See RUNWAY CONDITION CODES.)

**RUNWAY END IDENTIFIER LIGHTS (REIL)**–

(See AIRPORT LIGHTING.)

**RUNWAY ENTRANCE LIGHTS (REL)**–An array of red lights which include the first light at the hold line followed by a series of evenly spaced lights to the runway edge aligned with the taxiway centerline, and one additional light at the runway centerline in line with the last two lights before the runway edge.

**RUNWAY GRADIENT**– The average slope, measured in percent, between two ends or points on a runway. Runway gradient is depicted on Government aerodrome sketches when total runway gradient exceeds 0.3%.

**RUNWAY HEADING**– The magnetic direction that corresponds with the runway centerline extended, not the painted runway number. When cleared to “fly or maintain runway heading,” pilots are expected to fly or maintain the heading that corresponds with the extended centerline of the departure runway. Drift correction shall not be applied; e.g., Runway 4, actual magnetic heading of the runway centerline 044, fly 044.

**RUNWAY IN USE/ACTIVE RUNWAY/DUTY RUNWAY**– Any runway or runways currently being used for takeoff or landing. When multiple runways are used, they are all considered active runways. In the metering sense, a selectable adapted item which specifies the landing runway configuration or direction of traffic flow. The adapted optimum flight plan from each transition fix to the vertex is determined by the runway configuration for arrival metering processing purposes.

**RUNWAY LIGHTS**–

(See AIRPORT LIGHTING.)

**RUNWAY MARKINGS**–

(See AIRPORT MARKING AIDS.)

**RUNWAY OVERRUN**– In military aviation exclusively, a stabilized or paved area beyond the end of a runway, of the same width as the runway plus shoulders, centered on the extended runway centerline.

**RUNWAY PROFILE DESCENT**– An instrument flight rules (IFR) air traffic control arrival procedure to a runway published for pilot use in graphic and/or textual form and may be associated with a STAR. Runway Profile Descents provide routing and may depict crossing altitudes, speed restrictions, and headings to be flown from the en route structure to the point where the pilot will receive clearance for and execute an instrument approach procedure. A Runway Profile Descent may apply to more than one runway if so stated on the chart.

(Refer to AIM.)

**RUNWAY SAFETY AREA**– A defined surface surrounding the runway prepared, or suitable, for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. The dimensions of the RSA vary and can be determined by using the criteria contained within AC 150/5300-13, Airport Design, Chapter 3. Figure 3–1 in AC 150/5300-13 depicts the RSA. The design standards dictate that the RSA shall be:

- a.** Cleared, graded, and have no potentially hazardous ruts, humps, depressions, or other surface variations;
- b.** Drained by grading or storm sewers to prevent water accumulation;
- c.** Capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of

aircraft without causing structural damage to the aircraft; and,

- d.** Free of objects, except for objects that need to be located in the runway safety area because of their function. These objects shall be constructed on low impact resistant supports (frangible mounted structures) to the lowest practical height with the frangible point no higher than 3 inches above grade.

(Refer to AC 150/5300-13, Airport Design, Chapter 3.)

**RUNWAY STATUS LIGHTS (RWSL) SYSTEM**–

The RWSL is a system of runway and taxiway lighting to provide pilots increased situational awareness by illuminating runway entry lights (REL) when the runway is unsafe for entry or crossing, and take-off hold lights (THL) when the runway is unsafe for departure.

**RUNWAY TRANSITION**–

- a.** Conventional STARs/SIDs. The portion of a STAR/SID that serves a particular runway or runways at an airport.

- b.** RNAV STARs/SIDs. Defines a path(s) from the common route to the final point(s) on a STAR. For a SID, the common route that serves a particular runway or runways at an airport.

**RUNWAY USE PROGRAM**– A noise abatement runway selection plan designed to enhance noise abatement efforts with regard to airport communities for arriving and departing aircraft. These plans are developed into runway use programs and apply to all turbojet aircraft 12,500 pounds or heavier; turbojet aircraft less than 12,500 pounds are included only if the airport proprietor determines that the aircraft creates a noise problem. Runway use programs are coordinated with FAA offices, and safety criteria used in these programs are developed by the Office of Flight Operations. Runway use programs are administered by the Air Traffic Service as “Formal” or “Informal” programs.

- a.** Formal Runway Use Program– An approved noise abatement program which is defined and acknowledged in a Letter of Understanding between Flight Operations, Air Traffic Service, the airport proprietor, and the users. Once established, participation in the program is mandatory for aircraft operators and pilots as provided for in 14 CFR Section 91.129.

- b.** Informal Runway Use Program– An approved noise abatement program which does not require a

Letter of Understanding, and participation in the program is voluntary for aircraft operators/pilots.

RUNWAY VISIBILITY VALUE (RVV)–  
(See VISIBILITY.)

RUNWAY VISUAL RANGE (RVR)–  
(See VISIBILITY.)

RwyCC–  
(See RUNWAY CONDITION CODES.)

RwyCR–  
(See RUNWAY CONDITION REPORT.)

# S

SAA–

(See SPECIAL ACTIVITY AIRSPACE.)

**SAFETY ALERT–** A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller's judgment, places the aircraft in unsafe proximity to terrain, obstructions, or other aircraft. The controller may discontinue the issuance of further alerts if the pilot advises he/she is taking action to correct the situation or has the other aircraft in sight.

**a. Terrain/Obstruction Alert–** A safety alert issued by ATC to aircraft under their control if ATC is aware the aircraft is at an altitude which, in the controller's judgment, places the aircraft in unsafe proximity to terrain/obstructions; e.g., "Low Altitude Alert, check your altitude immediately."

**b. Aircraft Conflict Alert–** A safety alert issued by ATC to aircraft under their control if ATC is aware of an aircraft that is not under their control at an altitude which, in the controller's judgment, places both aircraft in unsafe proximity to each other. With the alert, ATC will offer the pilot an alternate course of action when feasible; e.g., "Traffic Alert, advise you turn right heading zero niner zero or climb to eight thousand immediately."

**Note:** The issuance of a safety alert is contingent upon the capability of the controller to have an awareness of an unsafe condition. The course of action provided will be predicated on other traffic under ATC control. Once the alert is issued, it is solely the pilot's prerogative to determine what course of action, if any, he/she will take.

**SAFETY LOGIC SYSTEM–** A software enhancement to ASDE-3, ASDE-X, and ASSC, that predicts the path of aircraft landing and/or departing, and/or vehicular movements on runways. Visual and aural alarms are activated when the safety logic projects a potential collision. The Airport Movement Area Safety System (AMASS) is a safety logic system enhancement to the ASDE-3. The Safety Logic System for ASDE-X and ASSC is an integral part of the software program.

**SAFETY LOGIC SYSTEM ALERTS–**

**a. ALERT–** An actual situation involving two real safety logic tracks (aircraft/aircraft, aircraft/vehicle,

or aircraft/other tangible object) that safety logic has predicted will result in an imminent collision, based upon the current set of Safety Logic parameters.

**b. FALSE ALERT–**

**1.** Alerts generated by one or more false surface-radar targets that the system has interpreted as real tracks and placed into safety logic.

**2.** Alerts in which the safety logic software did not perform correctly, based upon the design specifications and the current set of Safety Logic parameters.

**3.** The alert is generated by surface radar targets caused by moderate or greater precipitation.

**c. NUISANCE ALERT–** An alert in which one or more of the following is true:

**1.** The alert is generated by a known situation that is not considered an unsafe operation, such as LAHSO or other approved operations.

**2.** The alert is generated by inaccurate secondary radar data received by the Safety Logic System.

**3.** One or more of the aircraft involved in the alert is not intending to use a runway (for example, helicopter, pipeline patrol, non-Mode C overflight, etc.).

**d. VALID NON-ALERT–** A situation in which the safety logic software correctly determines that an alert is not required, based upon the design specifications and the current set of Safety Logic parameters.

**e. INVALID NON-ALERT–** A situation in which the safety logic software did not issue an alert when an alert was required, based upon the design specifications.

**SAIL BACK–** A maneuver during high wind conditions (usually with power off) where float plane movement is controlled by water rudders/opening and closing cabin doors.

**SAME DIRECTION AIRCRAFT–** Aircraft are operating in the same direction when:

**a.** They are following the same track in the same direction; or

**b.** Their tracks are parallel and the aircraft are flying in the same direction; or

**c.** Their tracks intersect at an angle of less than 45 degrees.

**SAR–**

(See SEARCH AND RESCUE.)

**SAY AGAIN–** Used to request a repeat of the last transmission. Usually specifies transmission or portion thereof not understood or received; e.g., “Say again all after ABRAM VOR.”

**SAY ALTITUDE–** Used by ATC to ascertain an aircraft’s specific altitude/flight level. When the aircraft is climbing or descending, the pilot should state the indicated altitude rounded to the nearest 100 feet.

**SAY HEADING–** Used by ATC to request an aircraft heading. The pilot should state the actual heading of the aircraft.

**SCHEDULED TIME OF ARRIVAL (STA)–** A STA is the desired time that an aircraft should cross a certain point (landing or metering fix). It takes other traffic and airspace configuration into account. A STA time shows the results of the TBFM scheduler that has calculated an arrival time according to parameters such as optimized spacing, aircraft performance, and weather.

**SDF–**

(See SIMPLIFIED DIRECTIONAL FACILITY.)

**SEA LANE–** A designated portion of water outlined by visual surface markers for and intended to be used by aircraft designed to operate on water.

**SEARCH AND RESCUE–** A service which seeks missing aircraft and assists those found to be in need of assistance. It is a cooperative effort using the facilities and services of available Federal, state and local agencies. The U.S. Coast Guard is responsible for coordination of search and rescue for the Maritime Region, and the U.S. Air Force is responsible for search and rescue for the Inland Region. Information pertinent to search and rescue should be passed through any air traffic facility or be transmitted directly to the Rescue Coordination Center by telephone.

(See FLIGHT SERVICE STATION.)

(See RESCUE COORDINATION CENTER.)

(Refer to AIM.)

**SEARCH AND RESCUE FACILITY–** A facility responsible for maintaining and operating a search and rescue (SAR) service to render aid to persons and property in distress. It is any SAR unit, station, NET, or other operational activity which can be usefully

employed during an SAR Mission; e.g., a Civil Air Patrol Wing, or a Coast Guard Station.

(See SEARCH AND RESCUE.)

**SECNOT–**

(See SECURITY NOTICE.)

**SECONDARY RADAR TARGET–** A target derived from a transponder return presented on a radar display.

**SECTIONAL AERONAUTICAL CHARTS–**

(See AERONAUTICAL CHART.)

**SECTOR LIST DROP INTERVAL–** A parameter number of minutes after the meter fix time when arrival aircraft will be deleted from the arrival sector list.

**SECURITY NOTICE (SECNOT) –** A SECNOT is a request originated by the Air Traffic Security Coordinator (ATSC) for an extensive communications search for aircraft involved, or suspected of being involved, in a security violation, or are considered a security risk. A SECNOT will include the aircraft identification, search area, and expiration time. The search area, as defined by the ATSC, could be a single airport, multiple airports, a radius of an airport or fix, or a route of flight. Once the expiration time has been reached, the SECNOT is considered to be cancelled.

**SECURITY SERVICES AIRSPACE –** Areas established through the regulatory process or by NOTAM, issued by the Administrator under title 14, CFR, sections 99.7, 91.141, and 91.139, which specify that ATC security services are required; i.e., ADIZ or temporary flight rules areas.

**SEE AND AVOID–** When weather conditions permit, pilots operating IFR or VFR are required to observe and maneuver to avoid other aircraft. Right-of-way rules are contained in 14 CFR Part 91.

**SEGMENTED CIRCLE–** A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

(Refer to AIM.)

**SEGMENTS OF AN INSTRUMENT APPROACH PROCEDURE–** An instrument approach procedure may have as many as four separate segments depending on how the approach procedure is structured.

**a. Initial Approach–** The segment between the initial approach fix and the intermediate fix or the

point where the aircraft is established on the intermediate course or final approach course.

(See ICAO term INITIAL APPROACH SEGMENT.)

**b. Intermediate Approach**– The segment between the intermediate fix or point and the final approach fix.

(See ICAO term INTERMEDIATE APPROACH SEGMENT.)

**c. Final Approach**– The segment between the final approach fix or point and the runway, airport, or missed approach point.

(See ICAO term FINAL APPROACH SEGMENT.)

**d. Missed Approach**– The segment between the missed approach point or the point of arrival at decision height and the missed approach fix at the prescribed altitude.

(Refer to 14 CFR Part 97.)

(See ICAO term MISSED APPROACH PROCEDURE.)

**SEPARATION**– In air traffic control, the spacing of aircraft to achieve their safe and orderly movement in flight and while landing and taking off.

(See SEPARATION MINIMA.)

(See ICAO term SEPARATION.)

**SEPARATION [ICAO]**– Spacing between aircraft, levels or tracks.

**SEPARATION MINIMA**– The minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures.

(See SEPARATION.)

**SERVICE**– A generic term that designates functions or assistance available from or rendered by air traffic control. For example, Class C service would denote the ATC services provided within a Class C airspace area.

**SEVERE WEATHER AVOIDANCE PLAN (SWAP)**– An approved plan to minimize the affect of severe weather on traffic flows in impacted terminal and/or ARTCC areas. A SWAP is normally implemented to provide the least disruption to the ATC system when flight through portions of airspace is difficult or impossible due to severe weather.

**SEVERE WEATHER FORECAST ALERTS**– Preliminary messages issued in order to alert users that a Severe Weather Watch Bulletin (WW) is being issued. These messages define areas of possible severe thunderstorms or tornado activity. The messages are unscheduled and issued as required by the Storm Prediction Center (SPC) at Norman, Oklahoma.

(See AIRMET.)

(See CONVECTIVE SIGMET.)

(See CWA.)

(See SIGMET.)

**SFA**–

(See SINGLE FREQUENCY APPROACH.)

**SFO**–

(See SIMULATED FLAMEOUT.)

**SHF**–

(See SUPER HIGH FREQUENCY.)

**SHORT RANGE CLEARANCE**– A clearance issued to a departing IFR flight which authorizes IFR flight to a specific fix short of the destination while air traffic control facilities are coordinating and obtaining the complete clearance.

**SHORT TAKEOFF AND LANDING AIRCRAFT (STOL)**– An aircraft which, at some weight within its approved operating weight, is capable of operating from a runway in compliance with the applicable STOL characteristics, airworthiness, operations, noise, and pollution standards.

(See VERTICAL TAKEOFF AND LANDING AIRCRAFT.)

**SIAP**–

(See STANDARD INSTRUMENT APPROACH PROCEDURE.)

**SID**–

(See STANDARD INSTRUMENT DEPARTURE.)

**SIDESTEP MANEUVER**– A visual maneuver accomplished by a pilot at the completion of an instrument approach to permit a straight-in landing on a parallel runway not more than 1,200 feet to either side of the runway to which the instrument approach was conducted.

(Refer to AIM.)

**SIGMET**– A weather advisory issued concerning weather significant to the safety of all aircraft.

SIGMET advisories cover severe and extreme turbulence, severe icing, and widespread dust or sandstorms that reduce visibility to less than 3 miles.

(See AIRMET.)

(See AWW.)

(See CONVECTIVE SIGMET.)

(See CWA.)

(See ICAO term SIGMET INFORMATION.)

(Refer to AIM.)

**SIGMET INFORMATION [ICAO]**– Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of aircraft operations.

***SIGNIFICANT METEOROLOGICAL INFORMATION***–

(See SIGMET.)

**SIGNIFICANT POINT**– A point, whether a named intersection, a NAVAID, a fix derived from a NAVAID(s), or geographical coordinate expressed in degrees of latitude and longitude, which is established for the purpose of providing separation, as a reporting point, or to delineate a route of flight.

**SIMPLIFIED DIRECTIONAL FACILITY (SDF)**– A NAVAID used for nonprecision instrument approaches. The final approach course is similar to that of an ILS localizer except that the SDF course may be offset from the runway, generally not more than 3 degrees, and the course may be wider than the localizer, resulting in a lower degree of accuracy.

(Refer to AIM.)

**SIMULATED FLAMEOUT**– A practice approach by a jet aircraft (normally military) at idle thrust to a runway. The approach may start at a runway (high key) and may continue on a relatively high and wide downwind leg with a continuous turn to final. It terminates in landing or low approach. The purpose of this approach is to simulate a flameout.

(See FLAMEOUT.)

**SIMULTANEOUS CLOSE PARALLEL APPROACHES**– A simultaneous, independent approach operation permitting ILS/RNAV/GLS approaches to airports having parallel runways separated by at least 3,000 feet and less than 4,300–feet between centerlines. Aircraft are permitted to pass each other during these simultaneous operations. Integral parts of a total system are radar, NTZ monitoring with enhanced FMA color displays

that include aural and visual alerts and predictive aircraft position software, communications override, ATC procedures, an Attention All Users Page (AAUP), PRM in the approach name, and appropriate ground based and airborne equipment. High update rate surveillance sensor required for certain runway or approach course separations.

**SIMULTANEOUS (CONVERGING) DEPENDENT APPROACHES**– An approach operation permitting ILS/RNAV/GLS approaches to runways or missed approach courses that intersect where required minimum spacing between the aircraft on each final approach course is required.

**SIMULTANEOUS (CONVERGING) INDEPENDENT APPROACHES**– An approach operation permitting ILS/RNAV/GLS approaches to non-parallel runways where approach procedure design maintains the required aircraft spacing throughout the approach and missed approach and hence the operations may be conducted independently.

**SIMULTANEOUS ILS APPROACHES**– An approach system permitting simultaneous ILS approaches to airports having parallel runways separated by at least 4,300 feet between centerlines. Integral parts of a total system are ILS, radar, communications, ATC procedures, and appropriate airborne equipment.

(See PARALLEL RUNWAYS.)

(Refer to AIM.)

**SIMULTANEOUS OFFSET INSTRUMENT APPROACH (SOIA)**– An instrument landing system comprised of an ILS PRM, RNAV PRM or GLS PRM approach to one runway and an offset LDA PRM with glideslope or an RNAV PRM or GLS PRM approach utilizing vertical guidance to another where parallel runway spaced less than 3,000 feet and at least 750 feet apart. The approach courses converge by 2.5 to 3 degrees. Simultaneous close parallel PRM approach procedures apply up to the point where the approach course separation becomes 3,000 feet, at the offset MAP. From the offset MAP to the runway threshold, visual separation by the aircraft conducting the offset approach is utilized.

(Refer to AIM)

**SIMULTANEOUS (PARALLEL) DEPENDENT APPROACHES**– An approach operation permitting ILS/RNAV/GLS approaches to adjacent parallel runways where prescribed diagonal spacing must be maintained. Aircraft are not permitted to pass each



other during simultaneous dependent operations. Integral parts of a total system ATC procedures, and appropriate airborne and ground based equipment.

**SINGLE DIRECTION ROUTES**– Preferred IFR Routes which are sometimes depicted on high altitude en route charts and which are normally flown in one direction only.

(See **PREFERRED IFR ROUTES**.)

(Refer to **CHART SUPPLEMENT U.S.**)

**SINGLE FREQUENCY APPROACH**– A service provided under a letter of agreement to military single-piloted turbojet aircraft which permits use of a single UHF frequency during approach for landing. Pilots will not normally be required to change frequency from the beginning of the approach to touchdown except that pilots conducting an en route descent are required to change frequency when control is transferred from the air route traffic control center to the terminal facility. The abbreviation “SFA” in the DOD FLIP IFR Supplement under “Communications” indicates this service is available at an aerodrome.

**SINGLE-PILOTED AIRCRAFT**– A military turbojet aircraft possessing one set of flight controls, tandem cockpits, or two sets of flight controls but operated by one pilot is considered single-piloted by ATC when determining the appropriate air traffic service to be applied.

(See **SINGLE FREQUENCY APPROACH**.)

**SKYSPOTTER**– A pilot who has received specialized training in observing and reporting inflight weather phenomena.

**SLASH**– A radar beacon reply displayed as an elongated target.

**SLDI**–

(See **SECTOR LIST DROP INTERVAL**.)

**SLOT TIME**–

(See **METER FIX TIME/SLOT TIME**.)

**SLOW TAXI**– To taxi a float plane at low power or low RPM.

**SN**–

(See **SYSTEM STRATEGIC NAVIGATION**.)

***SPEAK SLOWER***– Used in verbal communications as a request to reduce speech rate.

**SPECIAL ACTIVITY AIRSPACE (SAA)**– Any airspace with defined dimensions within the National Airspace System wherein limitations may be imposed upon aircraft operations. This airspace may be restricted areas, prohibited areas, military operations areas, air ATC assigned airspace, and any other designated airspace areas. The dimensions of this airspace are programmed into EDST and can be designated as either active or inactive by screen entry. Aircraft trajectories are constantly tested against the dimensions of active areas and alerts issued to the applicable sectors when violations are predicted.

(See **EN ROUTE DECISION SUPPORT TOOL**.)

**SPECIAL AIR TRAFFIC RULES (SATR)**– Rules that govern procedures for conducting flights in certain areas listed in 14 CFR Part 93. The term “SATR” is used in the United States to describe the rules for operations in specific areas designated in the Code of Federal Regulations.

(Refer to 14 CFR Part 93.)

**SPECIAL EMERGENCY**– A condition of air piracy or other hostile act by a person(s) aboard an aircraft which threatens the safety of the aircraft or its passengers.

**SPECIAL FLIGHT RULES AREA (SFRA)**– An area in the NAS, described in 14 CFR Part 93, wherein the flight of aircraft is subject to special traffic rules, unless otherwise authorized by air traffic control. Not all areas listed in 14 CFR Part 93 are designated SFRA, but special air traffic rules apply to all areas described in 14 CFR Part 93.

**SPECIAL INSTRUMENT APPROACH PROCEDURE**–

(See **INSTRUMENT APPROACH PROCEDURE**.)

**SPECIAL USE AIRSPACE**– Airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Types of special use airspace are:

**a. Alert Area**– Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft. Alert Areas are depicted on aeronautical charts for the information of nonparticipating pilots. All activities within an Alert Area are conducted in accordance with Federal Aviation Regulations, and pilots of participating aircraft as well as pilots

transiting the area are equally responsible for collision avoidance.

**b. Controlled Firing Area–** Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons and property on the ground.

**c. Military Operations Area (MOA)–** Permanent and temporary MOAs are airspace established outside of Class A airspace area to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted. Permanent MOAs are depicted on Sectional Aeronautical, VFR Terminal Area, and applicable En Route Low Altitude Charts.

Note: Temporary MOAs are not charted.

(Refer to AIM.)

**d. Prohibited Area–** Airspace designated under 14 CFR Part 73 within which no person may operate an aircraft without the permission of the using agency.

(Refer to AIM.)

(Refer to En Route Charts.)

**e. Restricted Area–** Permanent and temporary restricted areas are airspace designated under 14 CFR Part 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency. Permanent restricted areas are depicted on Sectional Aeronautical, VFR Terminal Area, and applicable En Route charts. Where joint use is authorized, the name of the ATC controlling facility is also shown.

Note: Temporary restricted areas are not charted.

(Refer to 14 CFR Part 73.)

(Refer to AIM.)

**f. Warning Area–** A warning area is airspace of defined dimensions extending from 3 nautical miles outward from the coast of the United States, that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning area is to warn nonparticipating pilots of the potential danger. A warning area may be located over domestic or international waters or both.

**SPECIAL VFR CONDITIONS–** Meteorological conditions that are less than those required for basic

VFR flight in Class B, C, D, or E surface areas and in which some aircraft are permitted flight under visual flight rules.

(See SPECIAL VFR OPERATIONS.)

(Refer to 14 CFR Part 91.)

**SPECIAL VFR FLIGHT [ICAO]–** A VFR flight cleared by air traffic control to operate within Class B, C, D, and E surface areas in meteorological conditions below VMC.

**SPECIAL VFR OPERATIONS–** Aircraft operating in accordance with clearances within Class B, C, D, and E surface areas in weather conditions less than the basic VFR weather minima. Such operations must be requested by the pilot and approved by ATC.

(See SPECIAL VFR CONDITIONS.)

(See ICAO term SPECIAL VFR FLIGHT.)

**SPEED–**

(See AIRSPEED.)

(See GROUND SPEED.)

**SPEED ADJUSTMENT–** An ATC procedure used to request pilots to adjust aircraft speed to a specific value for the purpose of providing desired spacing. Pilots are expected to maintain a speed of plus or minus 10 knots or 0.02 Mach number of the specified speed. Examples of speed adjustments are:

**a.** “Increase/reduce speed to Mach point (number).”

**b.** “Increase/reduce speed to (speed in knots)” or “Increase/reduce speed (number of knots) knots.”

**SPEED BRAKES–** Moveable aerodynamic devices on aircraft that reduce airspeed during descent and landing.

**SPEED SEGMENTS–** Portions of the arrival route between the transition point and the vertex along the optimum flight path for which speeds and altitudes are specified. There is one set of arrival speed segments adapted from each transition point to each vertex. Each set may contain up to six segments.

**SQUAWK (Mode, Code, Function)–** Activate specific modes/codes/functions on the aircraft transponder; e.g., “Squawk three/alpha, two one zero five, low.”

(See TRANSPONDER.)

**STA–**

(See SCHEDULED TIME OF ARRIVAL.)

**STAGING/QUEUEING–** The placement, integration, and segregation of departure aircraft in designated

movement areas of an airport by departure fix, EDCT, and/or restriction.

**STAND BY**– Means the controller or pilot must pause for a few seconds, usually to attend to other duties of a higher priority. Also means to wait as in “stand by for clearance.” The caller should reestablish contact if a delay is lengthy. “Stand by” is not an approval or denial.

**STANDARD INSTRUMENT APPROACH PROCEDURE (SIAP)**–

(See INSTRUMENT APPROACH PROCEDURE.)

**STANDARD INSTRUMENT DEPARTURE (SID)**– A preplanned instrument flight rule (IFR) air traffic control (ATC) departure procedure printed for pilot/controller use in graphic form to provide obstacle clearance and a transition from the terminal area to the appropriate en route structure. SIDs are primarily designed for system enhancement to expedite traffic flow and to reduce pilot/controller workload. ATC clearance must always be received prior to flying a SID.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

(See OBSTACLE DEPARTURE PROCEDURE.)

(Refer to AIM.)

**STANDARD RATE TURN**– A turn of three degrees per second.

**STANDARD TERMINAL ARRIVAL (STAR)**– A preplanned instrument flight rule (IFR) air traffic control arrival procedure published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.

**STANDARD TERMINAL ARRIVAL CHARTS**–

(See AERONAUTICAL CHART.)

**STANDARD TERMINAL AUTOMATION REPLACEMENT SYSTEM (STARS)**–

(See DTAS.)

**STAR**–

(See STANDARD TERMINAL ARRIVAL.)

**STATE AIRCRAFT**– Aircraft used in military, customs and police service, in the exclusive service of any government or of any political subdivision thereof, including the government of any state, territory, or possession of the United States or the

District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

**STATIC RESTRICTIONS**– Those restrictions that are usually not subject to change, fixed, in place, and/or published.

**STATIONARY RESERVATIONS**– Altitude reservations which encompass activities in a fixed area. Stationary reservations may include activities, such as special tests of weapons systems or equipment, certain U.S. Navy carrier, fleet, and anti-submarine operations, rocket, missile and drone operations, and certain aerial refueling or similar operations.

**STEP TAXI**– To taxi a float plane at full power or high RPM.

**STEP TURN**– A maneuver used to put a float plane in a planing configuration prior to entering an active sea lane for takeoff. The STEP TURN maneuver should only be used upon pilot request.

**STEPDOWN FIX**– A fix permitting additional descent within a segment of an instrument approach procedure by identifying a point at which a controlling obstacle has been safely overflown.

**STEREO ROUTE**– A routinely used route of flight established by users and ARTCCs identified by a coded name; e.g., ALPHA 2. These routes minimize flight plan handling and communications.

**STOL AIRCRAFT**–

(See SHORT TAKEOFF AND LANDING AIRCRAFT.)

**STOP ALTITUDE SQUAWK**– Used by ATC to inform an aircraft to turn off the automatic altitude reporting feature of its transponder. It is issued when the verbally reported altitude varies 300 feet or more from the automatic altitude report.

(See ALTITUDE READOUT.)

(See TRANSPONDER.)

**STOP AND GO**– A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point.

(See LOW APPROACH.)

(See OPTION APPROACH.)

**STOP BURST**–

(See STOP STREAM.)

**STOP BUZZER**–

(See STOP STREAM.)

**STOP SQUAWK (Mode or Code)**– Used by ATC to tell the pilot to turn specified functions of the aircraft transponder off.

(See STOP ALTITUDE SQUAWK.)

(See TRANSPONDER.)

**STOP STREAM**– Used by ATC to request a pilot to suspend electronic attack activity.

(See JAMMING.)

**STOPOVER FLIGHT PLAN**– A flight plan format which permits in a single submission the filing of a sequence of flight plans through interim full-stop destinations to a final destination.

**STOPWAY**– An area beyond the takeoff runway no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff, without causing structural damage to the airplane, and designated by the airport authorities for use in decelerating the airplane during an aborted takeoff.

**STRAIGHT-IN APPROACH IFR**– An instrument approach wherein final approach is begun without first having executed a procedure turn, not necessarily completed with a straight-in landing or made to straight-in landing minimums.

(See LANDING MINIMUMS.)

(See STRAIGHT-IN APPROACH VFR.)

(See STRAIGHT-IN LANDING.)

**STRAIGHT-IN APPROACH VFR**– Entry into the traffic pattern by interception of the extended runway centerline (final approach course) without executing any other portion of the traffic pattern.

(See TRAFFIC PATTERN.)

**STRAIGHT-IN LANDING**– A landing made on a runway aligned within 30° of the final approach course following completion of an instrument approach.

(See STRAIGHT-IN APPROACH IFR.)

**STRAIGHT-IN LANDING MINIMUMS**–

(See LANDING MINIMUMS.)

**STRAIGHT-IN MINIMUMS**–

(See STRAIGHT-IN LANDING MINIMUMS.)

**STRATEGIC PLANNING**– Planning whereby solutions are sought to resolve potential conflicts.

**SUBSTITUTE ROUTE**– A route assigned to pilots when any part of an airway or route is unusable because of NAVAID status. These routes consist of:

a. Substitute routes which are shown on U.S. Government charts.

b. Routes defined by ATC as specific NAVAID radials or courses.

c. Routes defined by ATC as direct to or between NAVAIDs.

**SUNSET AND SUNRISE**– The mean solar times of sunset and sunrise as published in the Nautical Almanac, converted to local standard time for the locality concerned. Within Alaska, the end of evening civil twilight and the beginning of morning civil twilight, as defined for each locality.

**SUPPLEMENTAL WEATHER SERVICE LOCATION**– Airport facilities staffed with contract personnel who take weather observations and provide current local weather to pilots via telephone or radio. (All other services are provided by the parent FSS.)

**SUPPS**– Refers to ICAO Document 7030 Regional Supplementary Procedures. SUPPS contain procedures for each ICAO Region which are unique to that Region and are not covered in the worldwide provisions identified in the ICAO Air Navigation Plan. Procedures contained in Chapter 8 are based in part on those published in SUPPS.

**SURFACE AREA**– The airspace contained by the lateral boundary of the Class B, C, D, or E airspace designated for an airport that begins at the surface and extends upward.

**SURPIC**– A description of surface vessels in the area of a Search and Rescue incident including their predicted positions and their characteristics.

(Refer to FAA Order JO 7110.65, Para 10-6-4, INFLIGHT CONTINGENCIES.)

**SURVEILLANCE APPROACH**– An instrument approach wherein the air traffic controller issues instructions, for pilot compliance, based on aircraft position in relation to the final approach course (azimuth), and the distance (range) from the end of the runway as displayed on the controller's radar scope. The controller will provide recommended altitudes on final approach if requested by the pilot.

(Refer to AIM.)

**SWAP**–

(See SEVERE WEATHER AVOIDANCE PLAN.)

SWSL–

(See SUPPLEMENTAL WEATHER SERVICE  
LOCATION.)

SYSTEM STRATEGIC NAVIGATION– Military  
activity accomplished by navigating along a

preplanned route using internal aircraft systems to  
maintain a desired track. This activity normally  
requires a lateral route width of 10 NM and altitude  
range of 1,000 feet to 6,000 feet AGL with some route  
segments that permit terrain following.



# T

## TACAN–

(See TACTICAL AIR NAVIGATION.)

**TACAN-ONLY AIRCRAFT**– An aircraft, normally military, possessing TACAN with DME but no VOR navigational system capability. Clearances must specify TACAN or VORTAC fixes and approaches.

**TACTICAL AIR NAVIGATION (TCAN)**– An ultra-high frequency electronic rho-theta air navigation aid which provides suitably equipped aircraft a continuous indication of bearing and distance to the TACAN station.

(See VORTAC.)

(Refer to AIM.)

**TAILWIND**– Any wind more than 90 degrees to the longitudinal axis of the runway. The magnetic direction of the runway shall be used as the basis for determining the longitudinal axis.

## TAKEOFF AREA–

(See LANDING AREA.)

**TAKEOFF DISTANCE AVAILABLE (TODA)**– The takeoff run available plus the length of any remaining runway or clearway beyond the far end of the takeoff run available.

(See ICAO term TAKEOFF DISTANCE AVAILABLE.)

**TAKEOFF DISTANCE AVAILABLE [ICAO]**– The length of the takeoff run available plus the length of the clearway, if provided.

**TAKEOFF HOLD LIGHTS (THL)**– The THL system is composed of in-pavement lighting in a double, longitudinal row of lights aligned either side of the runway centerline. The lights are focused toward the arrival end of the runway at the “line up and wait” point, and they extend for 1,500 feet in front of the holding aircraft. Illuminated red lights indicate to an aircraft in position for takeoff or rolling that it is unsafe to takeoff because the runway is occupied or about to be occupied by an aircraft or vehicle.

**TAKEOFF ROLL** – The process whereby an aircraft is aligned with the runway centerline and the aircraft is moving with the intent to take off. For helicopters,

this pertains to the act of becoming airborne after departing a takeoff area.

**TAKEOFF RUN AVAILABLE (TORA)** – The runway length declared available and suitable for the ground run of an airplane taking off.

(See ICAO term TAKEOFF RUN AVAILABLE.)

**TAKEOFF RUN AVAILABLE [ICAO]**– The length of runway declared available and suitable for the ground run of an aeroplane take-off.

**TARGET**– The indication shown on an analog display resulting from a primary radar return or a radar beacon reply.

(See ASSOCIATED.)

(See DIGITAL TARGET.)

(See DIGITIZED RADAR TARGET.)

(See FUSED TARGET.)

(See PRIMARY RADAR TARGET.)

(See RADAR.)

(See SECONDARY RADAR TARGET.)

(See TARGET SYMBOL.)

(See ICAO term TARGET.)

(See UNASSOCIATED.)

**TARGET [ICAO]**– In radar:

**a.** Generally, any discrete object which reflects or retransmits energy back to the radar equipment.

**b.** Specifically, an object of radar search or surveillance.

**TARGET RESOLUTION**– A process to ensure that correlated radar targets do not touch. Target resolution must be applied as follows:

**a.** Between the edges of two primary targets or the edges of the ASR-9/11 primary target symbol.

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

**c.** Between the ends of two beacon control slashes.

Note 1: Mandatory traffic advisories and safety alerts must be issued when this procedure is used.

Note 2: This procedure must not be used when utilizing mosaic radar systems or multi-sensor mode.

**TARGET SYMBOL**– A computer-generated indication shown on a radar display resulting from a primary radar return or a radar beacon reply.

**TARMAC DELAY**– The holding of an aircraft on the ground either before departure or after landing with no opportunity for its passengers to deplane.

**TARMAC DELAY AIRCRAFT**– An aircraft whose pilot-in-command has requested to taxi to the ramp, gate, or alternate deplaning area to comply with the Three-hour Tarmac Rule.

**TARMAC DELAY REQUEST**– A request by the pilot-in-command to taxi to the ramp, gate, or alternate deplaning location to comply with the Three-hour Tarmac Rule.

**TAS**–

(See **TERMINAL AUTOMATION SYSTEMS**.)

**TAWS**–

(See **TERRAIN AWARENESS WARNING SYSTEM**.)

**TAXI**– The movement of an airplane under its own power on the surface of an airport (14 CFR Section 135.100 [Note]). Also, it describes the surface movement of helicopters equipped with wheels.

(See **AIR TAXI**.)

(See **HOVER TAXI**.)

(Refer to 14 CFR Section 135.100.)

(Refer to **AIM**.)

**TAXI PATTERNS**– Patterns established to illustrate the desired flow of ground traffic for the different runways or airport areas available for use.

**TCAS**–

(See **TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM**.)

**TCH**–

(See **THRESHOLD CROSSING HEIGHT**.)

**TCLT**–

(See **TENTATIVE CALCULATED LANDING TIME**.)

**TDLS**–

(See **TERMINAL DATA LINK SYSTEM**.)

**TDZE**–

(See **TOUCHDOWN ZONE ELEVATION**.)

**TELEPHONE INFORMATION BRIEFING SERVICE**– A continuous telephone recording of meteorological and/or aeronautical information.

(Refer to **AIM**.)

**TEMPORARY FLIGHT RESTRICTION (TFR)**– A TFR is a regulatory action issued by the FAA via the U.S. NOTAM System, under the authority of United States Code, Title 49. TFRs are issued within the sovereign airspace of the United States and its territories to restrict certain aircraft from operating within a defined area on a temporary basis to protect persons or property in the air or on the ground. While not all inclusive, TFRs may be issued for disaster or hazard situations such as: toxic gas leaks or spills, fumes from flammable agents, aircraft accident/incident sites, aviation or ground resources engaged in wildfire suppression, or aircraft relief activities following a disaster. TFRs may also be issued in support of VIP movements, for reasons of national security; or when determined necessary for the management of air traffic in the vicinity of aerial demonstrations or major sporting events. NAS users or other interested parties should contact a FSS for TFR information. Additionally, TFR information can be found in automated briefings, NOTAM publications, and on the internet at <http://www.faa.gov>. The FAA also distributes TFR information to aviation user groups for further dissemination.

**TENTATIVE CALCULATED LANDING TIME (TCLT)**– A projected time calculated for adapted vertex for each arrival aircraft based upon runway configuration, airport acceptance rate, airport arrival delay period, and other metered arrival aircraft. This time is either the VTA of the aircraft or the TCLT/ACLT of the previous aircraft plus the AAI, whichever is later. This time will be updated in response to an aircraft's progress and its current relationship to other arrivals.

**TERMINAL AREA**– A general term used to describe airspace in which approach control service or airport traffic control service is provided.

**TERMINAL AREA FACILITY**– A facility providing air traffic control service for arriving and departing IFR, VFR, Special VFR, and on occasion en route aircraft.

(See **APPROACH CONTROL FACILITY**.)

(See **TOWER**.)

**TERMINAL AUTOMATION SYSTEMS (TAS)**– TAS is used to identify the numerous automated tracking systems including ARTS IIE, ARTS IIIA, ARTS IIIE, STARS, and MEARTS.

**TERMINAL DATA LINK SYSTEM (TDLS)**– A system that provides Digital Automatic Terminal



Information Service (D-ATIS) both on a specified radio frequency and also, for subscribers, in a text message via data link to the cockpit or to a gate printer. TDLS also provides Pre-departure Clearances (PDC), at selected airports, to subscribers, through a service provider, in text to the cockpit or to a gate printer. In addition, TDLS will emulate the Flight Data Input/Output (FDIO) information within the control tower.

**TERMINAL RADAR SERVICE AREA**– Airspace surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a full-time basis for all IFR and participating VFR aircraft. The AIM contains an explanation of TRSA. TRSAs are depicted on VFR aeronautical charts. Pilot participation is urged but is not mandatory.

**TERMINAL VFR RADAR SERVICE**– A national program instituted to extend the terminal radar services provided instrument flight rules (IFR) aircraft to visual flight rules (VFR) aircraft. The program is divided into four types service referred to as basic radar service, terminal radar service area (TRSA) service, Class B service and Class C service. The type of service provided at a particular location is contained in the Chart Supplement U.S.

**a. Basic Radar Service**– These services are provided for VFR aircraft by all commissioned terminal radar facilities. Basic radar service includes safety alerts, traffic advisories, limited radar vectoring when requested by the pilot, and sequencing at locations where procedures have been established for this purpose and/or when covered by a letter of agreement. The purpose of this service is to adjust the flow of arriving IFR and VFR aircraft into the traffic pattern in a safe and orderly manner and to provide traffic advisories to departing VFR aircraft.

**b. TRSA Service**– This service provides, in addition to basic radar service, sequencing of all IFR and participating VFR aircraft to the primary airport and separation between all participating VFR aircraft. The purpose of this service is to provide separation between all participating VFR aircraft and all IFR aircraft operating within the area defined as a TRSA.

**c. Class C Service**– This service provides, in addition to basic radar service, approved separation between IFR and VFR aircraft, and sequencing of VFR aircraft, and sequencing of VFR arrivals to the primary airport.

**d. Class B Service**– This service provides, in addition to basic radar service, approved separation of aircraft based on IFR, VFR, and/or weight, and sequencing of VFR arrivals to the primary airport(s).

(See CONTROLLED AIRSPACE.)

(See TERMINAL RADAR SERVICE AREA.)

(Refer to AIM.)

(Refer to CHART SUPPLEMENT U.S.)

**TERMINAL-VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE STATION (TVOR)**– A very high frequency terminal omnirange station located on or near an airport and used as an approach aid.

(See NAVIGATIONAL AID.)

(See VOR.)

**TERRAIN AWARENESS WARNING SYSTEM (TAWS)**– An on-board, terrain proximity alerting system providing the aircrew ‘Low Altitude warnings’ to allow immediate pilot action.

**TERRAIN FOLLOWING**– The flight of a military aircraft maintaining a constant AGL altitude above the terrain or the highest obstruction. The altitude of the aircraft will constantly change with the varying terrain and/or obstruction.

**TETRAHEDRON**– A device normally located on uncontrolled airports and used as a landing direction indicator. The small end of a tetrahedron points in the direction of landing. At controlled airports, the tetrahedron, if installed, should be disregarded because tower instructions supersede the indicator.

(See SEGMENTED CIRCLE.)

(Refer to AIM.)

**TF**–

(See TERRAIN FOLLOWING.)

**THAT IS CORRECT**– The understanding you have is right.

**THREE-HOUR TARMAC RULE**– Rule that relates to Department of Transportation (DOT) requirements placed on airlines when tarmac delays are anticipated to reach 3 hours.

**360 OVERHEAD**–

(See OVERHEAD MANEUVER.)

**THRESHOLD**– The beginning of that portion of the runway usable for landing.

(See AIRPORT LIGHTING.)

(See DISPLACED THRESHOLD.)

**THRESHOLD CROSSING HEIGHT**– The theoretical height above the runway threshold at

which the aircraft's glideslope antenna would be if the aircraft maintains the trajectory established by the mean ILS glideslope or the altitude at which the calculated glidepath of an RNAV or GPS approaches.

(See GLIDESLOPE.)

(See THRESHOLD.)

#### THRESHOLD LIGHTS–

(See AIRPORT LIGHTING.)

#### TIBS–

(See TELEPHONE INFORMATION BRIEFING SERVICE.)

**TIE-IN FACILITY–** The FSS primarily responsible for providing FSS services, including telecommunications services for landing facilities or navigational aids located within the boundaries of a flight plan area (FPA). Three-letter identifiers are assigned to each FSS/FPA and are annotated as tie-in facilities in the Chart Supplement U.S., the Alaska Supplement, the Pacific Supplement, and FAA Order JO 7350.9, Location Identifiers. Large consolidated FSS facilities may have many tie-in facilities or FSS sectors within one facility.

(See FLIGHT PLAN AREA.)

(See FLIGHT SERVICE STATION.)

#### TIME BASED FLOW MANAGEMENT (TBFM)–

The hardware, software, methods, processes, and initiatives to manage air traffic flows based on time to balance air traffic demand with system capacity, and support the management of PBN. This includes, but not limited to, Adjacent Center Metering (ACM), En Route Departure Capability (EDC), Ground-based Interval Management-Spacing (GIM-S), Integrated Departure/Arrival Capability (IDAC), Single Center Metering (SCM), Time-Based Metering (TBM), Time-Based Scheduling (TBS), and Extended/Coupled Metering.

**TIME GROUP–** Four digits representing the hour and minutes from the Coordinated Universal Time (UTC) clock. FAA uses UTC for all operations. The term “ZULU” may be used to denote UTC. The word “local” or the time zone equivalent shall be used to denote local when local time is given during radio and telephone communications. When written, a time zone designator is used to indicate local time; e.g., “0205M” (Mountain). The local time may be based on the 24-hour clock system. The day begins at 0000 and ends at 2359.

#### TIS-B–

(See TRAFFIC INFORMATION SERVICE–BROADCAST.)

#### TMPA–

(See TRAFFIC MANAGEMENT PROGRAM ALERT.)

#### TMU–

(See TRAFFIC MANAGEMENT UNIT.)

#### TODA–

(See TAKEOFF DISTANCE AVAILABLE.)

(See ICAO term TAKEOFF DISTANCE AVAILABLE.)

#### TOI–

(See TRACK OF INTEREST.)

**TOP ALTITUDE–** In reference to SID published altitude restrictions, the charted “maintain” altitude contained in the procedure description or assigned by ATC.

#### TORA–

(See TAKEOFF RUN AVAILABLE.)

(See ICAO term TAKEOFF RUN AVAILABLE.)

**TORCHING–** The burning of fuel at the end of an exhaust pipe or stack of a reciprocating aircraft engine, the result of an excessive richness in the fuel air mixture.

#### TOS–

(See TRAJECTORY OPTIONS SET)

**TOTAL ESTIMATED ELAPSED TIME [ICAO]–** For IFR flights, the estimated time required from takeoff to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from takeoff to arrive over the destination aerodrome.

(See ICAO term ESTIMATED ELAPSED TIME.)

**TOUCH-AND-GO–** An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway.

#### TOUCH-AND-GO LANDING–

(See TOUCH-AND-GO.)

#### TOUCHDOWN–

**a.** The point at which an aircraft first makes contact with the landing surface.

**b.** Concerning a precision radar approach (PAR), it is the point where the glide path intercepts the landing surface.

(See ICAO term TOUCHDOWN.)

**TOUCHDOWN [ICAO]**– The point where the nominal glide path intercepts the runway.

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

**TOUCHDOWN RVR**–

(See VISIBILITY.)

**TOUCHDOWN ZONE**– The first 3,000 feet of the runway beginning at the threshold. The area is used for determination of Touchdown Zone Elevation in the development of straight-in landing minimums for instrument approaches.

(See ICAO term TOUCHDOWN ZONE.)

**TOUCHDOWN ZONE [ICAO]**– The portion of a runway, beyond the threshold, where it is intended landing aircraft first contact the runway.

**TOUCHDOWN ZONE ELEVATION**– The highest elevation in the first 3,000 feet of the landing surface. TDZE is indicated on the instrument approach procedure chart when straight-in landing minimums are authorized.

(See TOUCHDOWN ZONE.)

**TOUCHDOWN ZONE LIGHTING**–

(See AIRPORT LIGHTING.)

**TOWER**– A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. Authorizes aircraft to land or takeoff at the airport controlled by the tower or to transit the Class D airspace area regardless of flight plan or weather conditions (IFR or VFR). A tower may also provide approach control services (radar or nonradar).

(See AIRPORT TRAFFIC CONTROL SERVICE.)

(See APPROACH CONTROL FACILITY.)

(See APPROACH CONTROL SERVICE.)

(See MOVEMENT AREA.)

(See TOWER EN ROUTE CONTROL SERVICE.)

(See ICAO term AERODROME CONTROL TOWER.)

(Refer to AIM.)

**TOWER EN ROUTE CONTROL SERVICE**– The control of IFR en route traffic within delegated airspace between two or more adjacent approach control facilities. This service is designed to expedite traffic and reduce control and pilot communication requirements.

**TOWER TO TOWER**–

(See TOWER EN ROUTE CONTROL SERVICE.)

**TRACEABLE PRESSURE STANDARD**– The facility station pressure instrument, with certification/calibration traceable to the National Institute of Standards and Technology. Traceable pressure standards may be mercurial barometers, commissioned ASOS/AWSS or dual transducer AWOS, or portable pressure standards or DASI.

**TRACK**– The actual flight path of an aircraft over the surface of the earth.

(See COURSE.)

(See FLIGHT PATH.)

(See ROUTE.)

(See ICAO term TRACK.)

**TRACK [ICAO]**– The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (True, Magnetic, or Grid).

**TRACK OF INTEREST (TOI)**– Displayed data representing an airborne object that threatens or has the potential to threaten North America or National Security. Indicators may include, but are not limited to: noncompliance with air traffic control instructions or aviation regulations; extended loss of communications; unusual transmissions or unusual flight behavior; unauthorized intrusion into controlled airspace or an ADIZ; noncompliance with issued flight restrictions/security procedures; or unlawful interference with airborne flight crews, up to and including hijack. In certain circumstances, an object may become a TOI based on specific and credible intelligence pertaining to that particular aircraft/object, its passengers, or its cargo.

**TRACK OF INTEREST RESOLUTION**– A TOI will normally be considered resolved when: the aircraft/object is no longer airborne; the aircraft complies with air traffic control instructions, aviation regulations, and/or issued flight restrictions/security procedures; radio contact is re-established and authorized control of the aircraft is verified; the aircraft is intercepted and intent is verified to be

nonthreatening/nonhostile; TOI was identified based on specific and credible intelligence that was later determined to be invalid or unreliable; or displayed data is identified and characterized as invalid.

#### **TRAFFIC–**

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

- 1.** In response to a handoff or point out,
- 2.** In anticipation of a handoff or point out, or
- 3.** In conjunction with a request for control of an aircraft.

**b.** A term used by ATC to refer to one or more aircraft.

**TRAFFIC ADVISORIES–** Advisories issued to alert pilots to other known or observed air traffic which may be in such proximity to the position or intended route of flight of their aircraft to warrant their attention. Such advisories may be based on:

- a.** Visual observation.
- b.** Observation of radar identified and nonidentified aircraft targets on an ATC radar display, or
- c.** Verbal reports from pilots or other facilities.

**Note 1:** The word “traffic” followed by additional information, if known, is used to provide such advisories; e.g., “Traffic, 2 o’clock, one zero miles, southbound, eight thousand.”

**Note 2:** Traffic advisory service will be provided to the extent possible depending on higher priority duties of the controller or other limitations; e.g., radar limitations, volume of traffic, frequency congestion, or controller workload. Radar/nonradar traffic advisories do not relieve the pilot of his/her responsibility to see and avoid other aircraft. Pilots are cautioned that there are many times when the controller is not able to give traffic advisories concerning all traffic in the aircraft’s proximity; in other words, when a pilot requests or is receiving traffic advisories, he/she should not assume that all traffic will be issued.

(Refer to AIM.)

**TRAFFIC ALERT** (*aircraft call sign*), **TURN** (*left/right*) **IMMEDIATELY**, (*climb/descend*) **AND MAINTAIN** (*altitude*).

(See SAFETY ALERT.)

**TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM (TCAS)–** An airborne collision

avoidance system based on radar beacon signals which operates independent of ground-based equipment. TCAS-I generates traffic advisories only. TCAS-II generates traffic advisories, and resolution (collision avoidance) advisories in the vertical plane.

#### **TRAFFIC INFORMATION–**

(See TRAFFIC ADVISORIES.)

**TRAFFIC INFORMATION SERVICE–BROADCAST (TIS-B)–** The broadcast of ATC derived traffic information to ADS-B equipped (1090ES or UAT) aircraft. The source of this traffic information is derived from ground-based air traffic surveillance sensors, typically from radar targets. TIS-B service will be available throughout the NAS where there are both adequate surveillance coverage (radar) and adequate broadcast coverage from ADS-B ground stations. Loss of TIS-B will occur when an aircraft enters an area not covered by the GBT network. If this occurs in an area with adequate surveillance coverage (radar), nearby aircraft that remain within the adequate broadcast coverage (ADS-B) area will view the first aircraft. TIS-B may continue when an aircraft enters an area with inadequate surveillance coverage (radar); nearby aircraft that remain within the adequate broadcast coverage (ADS-B) area will not view the first aircraft.

**TRAFFIC IN SIGHT–** Used by pilots to inform a controller that previously issued traffic is in sight.

(See NEGATIVE CONTACT.)

(See TRAFFIC ADVISORIES.)

**TRAFFIC MANAGEMENT PROGRAM ALERT–** A term used in a Notice to Airmen (NOTAM) issued in conjunction with a special traffic management program to alert pilots to the existence of the program and to refer them to either the Notices to Airmen publication or a special traffic management program advisory message for program details. The contraction TMPA is used in NOTAM text.

**TRAFFIC MANAGEMENT UNIT–** The entity in ARTCCs and designated terminals directly involved in the active management of facility traffic. Usually under the direct supervision of an assistant manager for traffic management.

**TRAFFIC NO FACTOR–** Indicates that the traffic described in a previously issued traffic advisory is no factor.

**TRAFFIC NO LONGER OBSERVED–** Indicates that the traffic described in a previously issued traffic

advisory is no longer depicted on radar, but may still be a factor.

**TRAFFIC PATTERN**– The traffic flow that is prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach.

**a. Upwind Leg**– A flight path parallel to the landing runway in the direction of landing.

**b. Crosswind Leg**– A flight path at right angles to the landing runway off its upwind end.

**c. Downwind Leg**– A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.

**d. Base Leg**– A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

**e. Final Approach**– A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. An aircraft making a straight-in approach VFR is also considered to be on final approach.

(See STRAIGHT-IN APPROACH VFR.)

(See TAXI PATTERNS.)

(See ICAO term AERODROME TRAFFIC CIRCUIT.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**TRAFFIC SITUATION DISPLAY (TSD)**– TSD is a computer system that receives radar track data from all 20 CONUS ARTCCs, organizes this data into a mosaic display, and presents it on a computer screen. The display allows the traffic management coordinator multiple methods of selection and highlighting of individual aircraft or groups of aircraft. The user has the option of superimposing these aircraft positions over any number of background displays. These background options include ARTCC boundaries, any stratum of en route sector boundaries, fixes, airways, military and other special use airspace, airports, and geopolitical boundaries. By using the TSD, a coordinator can monitor any number of traffic situations or the entire systemwide traffic flows.

**TRAJECTORY**– A EDST representation of the path an aircraft is predicted to fly based upon a Current Plan or Trial Plan.

(See EN ROUTE DECISION SUPPORT TOOL.)

**TRAJECTORY MODELING**– The automated process of calculating a trajectory.

**TRAJECTORY OPTIONS SET (TOS)**– A TOS is an electronic message, submitted by the operator, that is used by the Collaborative Trajectory Options Program (CTOP) to manage the airspace captured in the traffic management program. The TOS will allow the operator to express the route and delay trade-off options that they are willing to accept.

**TRANSCRIBED WEATHER BROADCAST (TWEB)**– A continuous recording of meteorological and aeronautical information that is broadcast on L/MF and VOR facilities for pilots. (Provided only in Alaska.)

(Refer to AIM.)

**TRANSFER OF CONTROL**– That action whereby the responsibility for the separation of an aircraft is transferred from one controller to another.

(See ICAO term TRANSFER OF CONTROL.)

**TRANSFER OF CONTROL [ICAO]**– Transfer of responsibility for providing air traffic control service.

**TRANSFERRING CONTROLLER**– A controller/facility transferring control of an aircraft to another controller/facility.

(See ICAO term TRANSFERRING UNIT/CONTROLLER.)

**TRANSFERRING FACILITY**–

(See TRANSFERRING CONTROLLER.)

**TRANSFERRING UNIT/CONTROLLER [ICAO]**– Air traffic control unit/air traffic controller in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit/air traffic controller along the route of flight.

Note: See definition of accepting unit/controller.

**TRANSITION**–

**a.** The general term that describes the change from one phase of flight or flight condition to another; e.g., transition from en route flight to the approach or transition from instrument flight to visual flight.

**b.** A published procedure (DP Transition) used to connect the basic DP to one of several en route

airways/jet routes, or a published procedure (STAR Transition) used to connect one of several en route airways/jet routes to the basic STAR.

(Refer to DP/STAR Charts.)

**TRANSITION POINT**– A point at an adapted number of miles from the vertex at which an arrival aircraft would normally commence descent from its en route altitude. This is the first fix adapted on the arrival speed segments.

**TRANSITION WAYPOINT**– The waypoint that defines the beginning of a runway or en route transition on an RNAV SID or STAR.

**TRANSITIONAL AIRSPACE**– That portion of controlled airspace wherein aircraft change from one phase of flight or flight condition to another.

**TRANSMISSOMETER**– An apparatus used to determine visibility by measuring the transmission of light through the atmosphere. It is the measurement source for determining runway visual range (RVR) and runway visibility value (RVV).

(See VISIBILITY.)

***TRANSMITTING IN THE BLIND***– A transmission from one station to other stations in circumstances where two-way communication cannot be established, but where it is believed that the called stations may be able to receive the transmission.

**TRANSPONDER**– The airborne radar beacon receiver/transmitter portion of the Air Traffic Control Radar Beacon System (ATCRBS) which automatically receives radio signals from interrogators on the ground, and selectively replies with a specific reply pulse or pulse group only to those interrogations being received on the mode to which it is set to respond.

(See INTERROGATOR.)

(See ICAO term TRANSPONDER.)

(Refer to AIM.)

**TRANSPONDER [ICAO]**– A receiver/transmitter which will generate a reply signal upon proper interrogation; the interrogation and reply being on different frequencies.

**TRANSPONDER CODES**–

(See CODES.)

**TRANSPONDER OBSERVED** – Phraseology used to inform a VFR pilot the aircraft's assigned beacon code and position have been observed. Specifically, this term conveys to a VFR pilot the transponder reply has been observed and its position correlated for transit through the designated area.

**TRIAL PLAN**– A proposed amendment which utilizes automation to analyze and display potential conflicts along the predicted trajectory of the selected aircraft.

**TRSA**–

(See TERMINAL RADAR SERVICE AREA.)

**TSD**–

(See TRAFFIC SITUATION DISPLAY.)

**TURBOJET AIRCRAFT**– An aircraft having a jet engine in which the energy of the jet operates a turbine which in turn operates the air compressor.

**TURBOPROP AIRCRAFT**– An aircraft having a jet engine in which the energy of the jet operates a turbine which drives the propeller.

**TURBULENCE**– An atmospheric phenomenon that causes changes in aircraft altitude, attitude, and or airspeed with aircraft reaction depending on intensity. Pilots report turbulence intensity according to aircraft's reaction as follows:

**a. Light** – Causes slight, erratic changes in altitude and or attitude (pitch, roll, or yaw).

**b. Moderate**– Similar to Light but of greater intensity. Changes in altitude and or attitude occur but the aircraft remains in positive control at all times. It usually causes variations in indicated airspeed.

**c. Severe**– Causes large, abrupt changes in altitude and or attitude. It usually causes large variations in indicated airspeed. Aircraft may be momentarily out of control.

**d. Extreme**– The aircraft is violently tossed about and is practically impossible to control. It may cause structural damage.

(See CHOP.)

(Refer to AIM.)

**TURN ANTICIPATION**– (maneuver anticipation).

**TVOR**–

(See TERMINAL-VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION.)

**TWEB**–

(See TRANSCRIBED WEATHER BROADCAST.)

TWO-WAY RADIO COMMUNICATIONS FAILURE-  
(See LOST COMMUNICATIONS.)





# U

**UHF–**

(See **ULTRAHIGH FREQUENCY**.)

**ULTRAHIGH FREQUENCY (UHF)–** The frequency band between 300 and 3,000 MHz. The bank of radio frequencies used for military air/ground voice communications. In some instances this may go as low as 225 MHz and still be referred to as UHF.

**ULTRALIGHT VEHICLE–** A single-occupant aeronautical vehicle operated for sport or recreational purposes which does not require FAA registration, an airworthiness certificate, or pilot certification. Operation of an ultralight vehicle in certain airspace requires authorization from ATC.

(Refer to 14 CFR Part 103.)

**UNABLE–** Indicates inability to comply with a specific instruction, request, or clearance.

**UNASSOCIATED–** A radar target that does not display a data block with flight identification and altitude information.

(See **ASSOCIATED**.)

**UNDER THE HOOD–** Indicates that the pilot is using a hood to restrict visibility outside the cockpit while simulating instrument flight. An appropriately rated pilot is required in the other control seat while this operation is being conducted.

(Refer to 14 CFR Part 91.)

**UNFROZEN–** The Scheduled Time of Arrival (STA) tags, which are still being rescheduled by the time based flow management (TBFM) calculations. The aircraft will remain unfrozen until the time the corresponding estimated time of arrival (ETA) tag passes the preset freeze horizon for that aircraft's stream class. At this point the automatic rescheduling will stop, and the STA becomes "frozen."

**UNICOM–** A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOMs are shown on aeronautical charts and publications.

(See **CHART SUPPLEMENT U.S.**)

(Refer to **AIM**.)

**UNMANNED AIRCRAFT (UA)–** A device used or intended to be used for flight that has no onboard pilot. This device can be any type of airplane, helicopter, airship, or powered-lift aircraft. Unmanned free balloons, moored balloons, tethered aircraft, gliders, and unmanned rockets are not considered to be a UA.

**UNMANNED AIRCRAFT SYSTEM (UAS)–** An unmanned aircraft and its associated elements related to safe operations, which may include control stations (ground, ship, or air based), control links, support equipment, payloads, flight termination systems, and launch/recovery equipment. It consists of three elements: unmanned aircraft, control station, and data link.

**UNPUBLISHED ROUTE–** A route for which no minimum altitude is published or charted for pilot use. It may include a direct route between NAVAIDs, a radial, a radar vector, or a final approach course beyond the segments of an instrument approach procedure.

(See **PUBLISHED ROUTE**.)

(See **ROUTE**.)

**UNRELIABLE (GPS/WAAS)–** An advisory to pilots indicating the expected level of service of the GPS and/or WAAS may not be available. Pilots must then determine the adequacy of the signal for desired use.

**UPWIND LEG–**

(See **TRAFFIC PATTERN**.)

**URGENCY–** A condition of being concerned about safety and of requiring timely but not immediate assistance; a potential distress condition.

(See **ICAO term URGENCY**.)

**URGENCY [ICAO]–** A condition concerning the safety of an aircraft or other vehicle, or of person on board or in sight, but which does not require immediate assistance.

**USAFIB–**

(See **ARMY AVIATION FLIGHT INFORMATION BULLETIN**.)



# V

VASI–

(See VISUAL APPROACH SLOPE INDICATOR.)

VCOA–

(See VISUAL CLIMB OVER AIRPORT.)

VDP–

(See VISUAL DESCENT POINT.)

VECTOR– A heading issued to an aircraft to provide navigational guidance by radar.

(See ICAO term RADAR VECTORING.)

**VERIFY**– Request confirmation of information; e.g., “verify assigned altitude.”

**VERIFY SPECIFIC DIRECTION OF TAKEOFF (OR TURNS AFTER TAKEOFF)**– Used by ATC to ascertain an aircraft’s direction of takeoff and/or direction of turn after takeoff. It is normally used for IFR departures from an airport not having a control tower. When direct communication with the pilot is not possible, the request and information may be relayed through an FSS, dispatcher, or by other means.

(See IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES.)

VERTEX– The last fix adapted on the arrival speed segments. Normally, it will be the outer marker of the runway in use. However, it may be the actual threshold or other suitable common point on the approach path for the particular runway configuration.

VERTEX TIME OF ARRIVAL– A calculated time of aircraft arrival over the adapted vertex for the runway configuration in use. The time is calculated via the optimum flight path using adapted speed segments.

VERTICAL NAVIGATION (VNAV)– A function of area navigation (RNAV) equipment which calculates, displays, and provides vertical guidance to a profile or path.

VERTICAL SEPARATION– Separation between aircraft expressed in units of vertical distance.

(See SEPARATION.)

VERTICAL TAKEOFF AND LANDING AIRCRAFT (VTOL)– Aircraft capable of vertical climbs

and/or descents and of using very short runways or small areas for takeoff and landings. These aircraft include, but are not limited to, helicopters.

(See SHORT TAKEOFF AND LANDING AIRCRAFT.)

VERY HIGH FREQUENCY (VHF)– The frequency band between 30 and 300 MHz. Portions of this band, 108 to 118 MHz, are used for certain NAVAIDs; 118 to 136 MHz are used for civil air/ground voice communications. Other frequencies in this band are used for purposes not related to air traffic control.

VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION–

(See VOR.)

VERY LOW FREQUENCY (VLF)– The frequency band between 3 and 30 kHz.

VFR–

(See VISUAL FLIGHT RULES.)

VFR AIRCRAFT– An aircraft conducting flight in accordance with visual flight rules.

(See VISUAL FLIGHT RULES.)

**VFR CONDITIONS**– Weather conditions equal to or better than the minimum for flight under visual flight rules. The term may be used as an ATC clearance/instruction only when:

a. An IFR aircraft requests a climb/descent in VFR conditions.

b. The clearance will result in noise abatement benefits where part of the IFR departure route does not conform to an FAA approved noise abatement route or altitude.

c. A pilot has requested a practice instrument approach and is not on an IFR flight plan.

Note: All pilots receiving this authorization must comply with the VFR visibility and distance from cloud criteria in 14 CFR Part 91. Use of the term does not relieve controllers of their responsibility to separate aircraft in Class B and Class C airspace or TRSAs as required by FAA Order JO 7110.65. When used as an ATC clearance/instruction, the term may be abbreviated “VFR;” e.g., “MAINTAIN VFR,” “CLIMB/DESCEND VFR,” etc.

VFR FLIGHT–

(See VFR AIRCRAFT.)

**VFR MILITARY TRAINING ROUTES (VR)**– Routes used by the Department of Defense and associated Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training under VFR below 10,000 feet MSL at airspeeds in excess of 250 knots IAS.

**VFR NOT RECOMMENDED**– An advisory provided by a flight service station to a pilot during a preflight or inflight weather briefing that flight under visual flight rules is not recommended. To be given when the current and/or forecast weather conditions are at or below VFR minimums. It does not abrogate the pilot's authority to make his/her own decision.

**VFR-ON-TOP**– ATC authorization for an IFR aircraft to operate in VFR conditions at any appropriate VFR altitude (as specified in 14 CFR and as restricted by ATC). A pilot receiving this authorization must comply with the VFR visibility, distance from cloud criteria, and the minimum IFR altitudes specified in 14 CFR Part 91. The use of this term does not relieve controllers of their responsibility to separate aircraft in Class B and Class C airspace or TRSAs as required by FAA Order JO 7110.65.

**VFR TERMINAL AREA CHARTS**–  
(See AERONAUTICAL CHART.)

**VFR WAYPOINT**–  
(See WAYPOINT.)

**VHF**–  
(See VERY HIGH FREQUENCY.)

**VHF OMNIDIRECTIONAL RANGE/TACTICAL AIR NAVIGATION**–  
(See VORTAC.)

**VIDEO MAP**– An electronically displayed map on the radar display that may depict data such as airports, heliports, runway centerline extensions, hospital emergency landing areas, NAVAIDs and fixes, reporting points, airway/route centerlines, boundaries, handoff points, special use tracks, obstructions, prominent geographic features, map alignment indicators, range accuracy marks, and/or minimum vectoring altitudes.

**VISIBILITY**– The ability, as determined by atmospheric conditions and expressed in units of

distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night. Visibility is reported as statute miles, hundreds of feet or meters.

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**a. Flight Visibility**– The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.

**b. Ground Visibility**– Prevailing horizontal visibility near the earth's surface as reported by the United States National Weather Service or an accredited observer.

**c. Prevailing Visibility**– The greatest horizontal visibility equaled or exceeded throughout at least half the horizon circle which need not necessarily be continuous.

**d. Runway Visibility Value (RVV)**– The visibility determined for a particular runway by a transmissometer. A meter provides a continuous indication of the visibility (reported in miles or fractions of miles) for the runway. RVV is used in lieu of prevailing visibility in determining minimums for a particular runway.

**e. Runway Visual Range (RVR)**– An instrumentally derived value, based on standard calibrations, that represents the horizontal distance a pilot will see down the runway from the approach end. It is based on the sighting of either high intensity runway lights or on the visual contrast of other targets whichever yields the greater visual range. RVR, in contrast to prevailing or runway visibility, is based on what a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range. It is based on the measurement of a transmissometer made near the touchdown point of the instrument runway and is reported in hundreds of feet. RVR is used in lieu of RVV and/or prevailing visibility in determining minimums for a particular runway.

**1. Touchdown RVR**– The RVR visibility readout values obtained from RVR equipment serving the runway touchdown zone.

**2. Mid-RVR**– The RVR readout values obtained from RVR equipment located midfield of the runway.

**3. Rollout RVR**– The RVR readout values obtained from RVR equipment located nearest the rollout end of the runway.

(See ICAO term FLIGHT VISIBILITY.)

(See ICAO term GROUND VISIBILITY.)

(See ICAO term RUNWAY VISUAL RANGE.)

(See ICAO term VISIBILITY.)

**VISIBILITY [ICAO]**– The ability, as determined by atmospheric conditions and expressed in units of distance, to see and identify prominent unlighted objects by day and prominent lighted objects by night.

**a. Flight Visibility**– The visibility forward from the cockpit of an aircraft in flight.

**b. Ground Visibility**– The visibility at an aerodrome as reported by an accredited observer.

**c. Runway Visual Range [RVR]**– The range over which the pilot of an aircraft on the centerline of a runway can see the runway surface markings or the lights delineating the runway or identifying its centerline.

**VISUAL APPROACH**– An approach conducted on an instrument flight rules (IFR) flight plan which authorizes the pilot to proceed visually and clear of clouds to the airport. The pilot must, at all times, have either the airport or the preceding aircraft in sight. This approach must be authorized and under the control of the appropriate air traffic control facility. Reported weather at the airport must be: ceiling at or above 1,000 feet, and visibility of 3 miles or greater.

(See ICAO term VISUAL APPROACH.)

**VISUAL APPROACH [ICAO]**– An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed in visual reference to terrain.

**VISUAL APPROACH SLOPE INDICATOR (VASI)**–

(See AIRPORT LIGHTING.)

**VISUAL CLIMB OVER AIRPORT (VCOA)**– A departure option for an IFR aircraft, operating in visual meteorological conditions equal to or greater than the specified visibility and ceiling, to visually conduct climbing turns over the airport to the published “climb-to” altitude from which to proceed with the instrument portion of the departure. VCOA procedures are developed to avoid obstacles greater than 3 statute miles from the departure end of the

runway as an alternative to complying with climb gradients greater than 200 feet per nautical mile. Pilots are responsible to advise ATC as early as possible of the intent to fly the VCOA option prior to departure. These textual procedures are published in the ‘Take-Off Minimums and (Obstacle) Departure Procedures’ section of the Terminal Procedures Publications and/or appear as an option on a Graphic ODP.

(See AIM.)

**VISUAL DESCENT POINT**– A defined point on the final approach course of a nonprecision straight-in approach procedure from which normal descent from the MDA to the runway touchdown point may be commenced, provided the approach threshold of that runway, or approach lights, or other markings identifiable with the approach end of that runway are clearly visible to the pilot.

**VISUAL FLIGHT RULES**– Rules that govern the procedures for conducting flight under visual conditions. The term “VFR” is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

(See INSTRUMENT FLIGHT RULES.)

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

(See VISUAL METEOROLOGICAL CONDITIONS.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**VISUAL HOLDING**– The holding of aircraft at selected, prominent geographical fixes which can be easily recognized from the air.

(See HOLDING FIX.)

**VISUAL METEOROLOGICAL CONDITIONS**– Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling equal to or better than specified minima.

(See INSTRUMENT FLIGHT RULES.)

(See INSTRUMENT METEOROLOGICAL CONDITIONS.)

(See VISUAL FLIGHT RULES.)

**VISUAL SEGMENT**–

(See PUBLISHED INSTRUMENT APPROACH PROCEDURE VISUAL SEGMENT.)

**VISUAL SEPARATION**– A means employed by ATC to separate aircraft in terminal areas and en route airspace in the NAS. There are two ways to effect this separation:

**a.** The tower controller sees the aircraft involved and issues instructions, as necessary, to ensure that the aircraft avoid each other.

**b.** A pilot sees the other aircraft involved and upon instructions from the controller provides his/her own separation by maneuvering his/her aircraft as necessary to avoid it. This may involve following another aircraft or keeping it in sight until it is no longer a factor.

(See SEE AND AVOID.)

(Refer to 14 CFR Part 91.)

**VLF**–

(See VERY LOW FREQUENCY.)

**VMC**–

(See VISUAL METEOROLOGICAL CONDITIONS.)

**VOICE SWITCHING AND CONTROL SYSTEM (VSCS)**– A computer controlled switching system that provides air traffic controllers with all voice circuits (air to ground and ground to ground) necessary for air traffic control.

(Refer to AIM.)

**VOR**– A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the National Airspace System. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature. Voice features may be used by ATC or FSS for transmitting instructions/information to pilots.

(See NAVIGATIONAL AID.)

(Refer to AIM.)

**VOR TEST SIGNAL**–

(See VOT.)

**VORTAC**– A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance measuring equipment (DME) at one site.

(See DISTANCE MEASURING EQUIPMENT.)

(See NAVIGATIONAL AID.)

(See TACAN.)

(See VOR.)

(Refer to AIM.)

**VORTICES**– Circular patterns of air created by the movement of an airfoil through the air when generating lift. As an airfoil moves through the atmosphere in sustained flight, an area of area of low pressure is created above it. The air flowing from the high pressure area to the low pressure area around and about the tips of the airfoil tends to roll up into two rapidly rotating vortices, cylindrical in shape. These vortices are the most predominant parts of aircraft wake turbulence and their rotational force is dependent upon the wing loading, gross weight, and speed of the generating aircraft. The vortices from medium to super aircraft can be of extremely high velocity and hazardous to smaller aircraft.

(See AIRCRAFT CLASSES.)

(See WAKE TURBULENCE.)

(Refer to AIM.)

**VOT**– A ground facility which emits a test signal to check VOR receiver accuracy. Some VOTs are available to the user while airborne, and others are limited to ground use only.

(See CHART SUPPLEMENT U.S.)

(Refer to 14 CFR Part 91.)

(Refer to AIM.)

**VR**–

(See VFR MILITARY TRAINING ROUTES.)

**VSCS**–

(See VOICE SWITCHING AND CONTROL SYSTEM.)

**VTA**–

(See VERTEX TIME OF ARRIVAL.)

**VTOL AIRCRAFT**–

(See VERTICAL TAKEOFF AND LANDING AIRCRAFT.)

# W

## WA–

(See AIRMET.)

(See WEATHER ADVISORY.)

## WAAS–

(See WIDE-AREA AUGMENTATION SYSTEM.)

**WAKE TURBULENCE–** Phenomena resulting from the passage of an aircraft through the atmosphere. The term includes vortices, thrust stream turbulence, jet blast, jet wash, propeller wash, and rotor wash both on the ground and in the air.

(See AIRCRAFT CLASSES.)

(See JET BLAST.)

(See VORTICES.)

(Refer to AIM.)

## WARNING AREA–

(See SPECIAL USE AIRSPACE.)

**WAYPOINT–** A predetermined geographical position used for route/instrument approach definition, progress reports, published VFR routes, visual reporting points or points for transitioning and/or circumnavigating controlled and/or special use airspace, that is defined relative to a VORTAC station or in terms of latitude/longitude coordinates.

**WEATHER ADVISORY–** In aviation weather forecast practice, an expression of hazardous weather conditions not predicted in the Aviation Surface Forecast, Aviation Cloud Forecast, or area forecast, as they affect the operation of air traffic and as prepared by the NWS.

(See AIRMET.)

(See SIGMET.)

**WEATHER RECONNAISSANCE AREA (WRA)–** A WRA is airspace with defined dimensions and published by Notice to Airmen, which is established to support weather reconnaissance/research flights. Air traffic control services are not provided within WRAs. Only participating weather reconnaissance/research aircraft from the 53<sup>rd</sup> Weather Reconnaissance Squadron and National Oceanic and Atmospheric Administration Aircraft Operations Center are permitted to operate within a WRA. A WRA may only be established in airspace within U.S. Flight Information Regions outside of U.S. territorial airspace.

## WHEN ABLE–

**a.** In conjunction with ATC instructions, gives the pilot the latitude to delay compliance until a condition or event has been reconciled. Unlike “pilot discretion,” when instructions are prefaced “when able,” the pilot is expected to seek the first opportunity to comply.

**b.** In conjunction with a weather deviation clearance, requires the pilot to determine when he/she is clear of weather, then execute ATC instructions.

**c.** Once a maneuver has been initiated, the pilot is expected to continue until the specifications of the instructions have been met. “When able,” should not be used when expeditious compliance is required.

**WIDE-AREA AUGMENTATION SYSTEM (WAAS)–** The WAAS is a satellite navigation system consisting of the equipment and software which augments the GPS Standard Positioning Service (SPS). The WAAS provides enhanced integrity, accuracy, availability, and continuity over and above GPS SPS. The differential correction function provides improved accuracy required for precision approach.

**WIDE AREA MULTILATERATION (WAM)–** A distributed surveillance technology which may utilize any combination of signals from Air Traffic Control Radar Beacon System (ATCRBS) (Modes A and C) and Mode S transponders, and ADS-B transmissions. Multiple geographically dispersed ground sensors measure the time-of-arrival of the transponder messages. Aircraft position is determined by joint processing of the time-difference-of-arrival (TDOA) measurements computed between a reference and the ground stations’ measured time-of-arrival.

**WILCO–** I have received your message, understand it, and will comply with it.

**WIND GRID DISPLAY–** A display that presents the latest forecasted wind data overlaid on a map of the ARTCC area. Wind data is automatically entered and updated periodically by transmissions from the National Weather Service. Winds at specific altitudes, along with temperatures and air pressure can be viewed.

**WIND SHEAR**– A change in wind speed and/or wind direction in a short distance resulting in a tearing or shearing effect. It can exist in a horizontal or vertical direction and occasionally in both.

**WIND SHEAR ESCAPE**– An unplanned abortive maneuver initiated by the pilot in command (PIC) as a result of onboard cockpit systems. Wind shear escapes are characterized by maximum thrust climbs in the low altitude terminal environment until wind shear conditions are no longer detected.

**WING TIP VORTICES**–  
(See VORTICES.)

***WORDS TWICE***–

**a.** As a request: “Communication is difficult. Please say every phrase twice.”

**b.** As information: “Since communications are difficult, every phrase in this message will be spoken twice.”

**WS**–

(See SIGMET.)

(See WEATHER ADVISORY.)

**WST**–

(See CONVECTIVE SIGMET.)

(See WEATHER ADVISORY.)



# INDEX

[References are to page numbers]

## A

ABANDONED APPROACH, 7-6-2  
 ABBREVIATED DEPARTURE CLEARANCE, 4-3-4  
 ABBREVIATED TRANSMISSIONS, 2-4-2  
 ABBREVIATIONS, 1-2-3  
 ACKNOWLEDGEMENT OF AUTOMATED NOTIFICATION, 13-1-5  
 ACL, 13-1-1  
 ADDITIONAL SEPARATION FOR FORMATION FLIGHTS, 5-5-6  
 ADJACENT AIRPORT OPERATION, 6-1-1  
 ADJACENT AIRPORT OPERATIONS, 7-8-2  
 ADJACENT AIRSPACE, 5-5-7  
 ADJUSTED MINIMUM FLIGHT LEVEL, 4-5-2  
 Ads-b alerts, 5-2-9  
 ADVANCE DESCENT CLEARANCE, 4-7-1  
 AIDC, 8-2-1  
 AIR DEFENSE EXERCISE BEACON CODE ASSIGNMENT, 5-2-5  
 AIR TRAFFIC SERVICE (ATS) ROUTES, 2-5-1  
 AIR TRAFFIC SERVICES INTERFACILITY DATA COMMUNICATIONS, 8-2-1  
 AIRBORNE MILITARY FLIGHTS, 2-2-4  
 AIRCRAFT BOMB THREATS, 10-2-4  
 AIRCRAFT CARRYING DANGEROUS MATERIALS, 9-2-1  
 Aircraft Equipment Suffix (Strips), 2-3-10  
 AIRCRAFT IDENTIFICATION, 2-4-8  
 Aircraft Identity (Strips), 2-3-9  
 Aircraft Orientation, 10-2-1  
 Aircraft Type (Strips), 2-3-10  
 AIRCRAFT TYPES, 2-4-11  
 AIRPORT CONDITIONS, 3-3-1, 4-7-5  
 AIRPORT GROUND EMERGENCY, 10-1-2  
 Airport Lighting, 3-4-1  
 Airport Surface Detection Procedures, 3-6-1  
   Radar-Only Mode, 3-6-2  
 Airport Traffic Control- Terminal, 3-1-1

AIRSPACE CLASSES, 2-4-11  
 AIRSPACE CLASSIFICATION, 12-1-1  
 AIT, 5-4-5  
 ALERTING SERVICE AND SPECIAL ASSISTANCE, 10-6-1  
 ALIGNMENT ACCURACY CHECK (RADAR), 5-1-1  
 ALNOT, 10-3-2  
 ALNOT CANCELLATION, 10-3-3  
 ALS INTENSITY SETTINGS, 3-4-2  
 ALSF-2/SSALR, 3-4-3  
 ALTERNATIVE ROUTES, 4-4-3  
 Altimeter Setting (Oceanic), 8-1-1  
 ALTIMETER SETTING ISSUANCE BELOW LOWEST USABLE FL, 2-7-1  
 Altimeter Settings, 2-7-1  
 ALTITUDE AMENDMENTS, 4-2-1  
 ALTITUDE AND DISTANCE LIMITATIONS, 4-1-1  
 ALTITUDE ASSIGNMENT, 7-5-2  
 Altitude Assignment and Verification, 4-5-1  
 ALTITUDE ASSIGNMENT FOR MILITARY HIGH ALTITUDE INSTRUMENT APPROACHES, 4-8-7  
 ALTITUDE ASSIGNMENTS, 7-7-1  
 ALTITUDE CHANGE FOR IMPROVED RECEPTION, 10-2-1  
 ALTITUDE CONFIRMATION- MODE C, 5-2-7  
 ALTITUDE CONFIRMATION- NON-MODE C, 5-2-8  
 ALTITUDE CONFIRMATION- NONRADAR, 4-5-8  
 ALTITUDE FILTERS, 5-2-9  
 ALTITUDE FOR DIRECTION OF FLIGHT, 7-3-2  
 ALTITUDE INFORMATION, 4-5-3, 5-11-1  
 ALTITUDE RESTRICTED LOW APPROACH, 3-10-8  
 ALTITUDE/FLIGHT LEVEL TRANSITION, 8-5-1  
 ALTRV CLEARANCE, 4-2-3  
 ALTRV INFORMATION, 2-2-2  
 ANNOTATIONS, 1-2-3  
 ANTICIPATED ALTITUDE CHANGES, 4-5-8

**[References are to page numbers]**

ANTICIPATING SEPARATION, 3-9-4  
 ANTICIPATING SEPARATION (ARRIVAL), 3-10-7  
 Application, 5-7-1  
 Approach Clearance Procedures, 4-8-1  
 APPROACH CONTROL SERVICE FOR VFR  
 ARRIVING AIRCRAFT, 7-1-1  
 APPROACH GUIDANCE TERMINATION, 5-11-2,  
 5-12-2  
 APPROACH INFORMATION, 4-7-4, 4-8-8, 5-10-1  
 APPROACH INTERVAL, 7-7-1  
 APPROACH LIGHTS, 3-4-2  
 APPROACH SEPARATION RESPONSIBILITY, 5-9-4  
 APPROACH SEQUENCE, 6-7-1  
 APPROACHES TO MULTIPLE RUNWAYS, 7-4-2  
 Arctic CTA, 8-10-1  
 ARRESTING SYSTEM OPERATION, 3-3-3  
 ARRIVAL INFORMATION, 4-7-3  
 ARRIVAL INFORMATION BY APPROACH  
 CONTROL FACILITIES, 4-7-5  
 ARRIVAL INSTRUCTIONS, 5-9-2  
 ARRIVAL MINIMA, 6-1-1  
 Arrival Procedures, 4-7-1  
 Arrival Procedures and Separation (ATCT), 3-10-1  
 ARRIVAL SEPARATION, 3-12-1  
 ARRIVAL/DEPARTURE RUNWAY VISIBILITY,  
 2-8-1  
 ARTS, 5-15-1  
 ATC Assigned Airspace, 9-3-1  
 ATC SECURITY SERVICES FOR THE  
 WASHINGTON, DC, SPECIAL FLIGHT RULES  
 AREA (DC SFRA), 9-2-4  
 ATC SERVICE, 2-1-1  
 ATC SURVEILLANCE SOURCE USE, 5-1-1  
 ATIS Application, 2-9-1  
 ATIS Content, 2-9-2  
 ATIS Procedures, 2-9-1  
 ATOP – Oceanic, 13-2-1  
 AUTHORIZED INTERRUPTIONS, 2-4-1  
 AUTHORIZED RELAYS, 2-4-2  
 AUTHORIZED TRANSMISSIONS, 2-4-1

AUTOMATED INFORMATION TRANSFER, 5-4-5  
 Automated Radar Terminal Systems – Terminal,  
 5-15-1  
 AUTOMATIC ALTITUDE REPORTING, 5-2-8  
 Automation – En Route, 5-14-1  
 AVOIDANCE OF AREAS OF NUCLEAR  
 RADIATION, 9-2-9  
 AWACS SPECIAL FLIGHTS, 9-2-9

**B**

Balloons, Unmanned Free, 9-6-1  
 BEACON CODE FOR PRESSURE SUIT FLIGHTS  
 AND FLIGHTS ABOVE FL 600, 5-2-5  
 BEACON IDENTIFICATION METHODS, 5-3-1  
 BEACON RANGE ACCURACY, 5-1-2  
 Beacon Systems, 5-2-1  
 BEACON TARGET DISPLACEMENT, 5-5-8  
 BEACON TERMINATION, 5-2-9  
 BELOW MINIMA REPORT BY PILOT, 4-7-4  
 BIRD ACTIVITY INFORMATION, 2-1-12  
 BLUE LIGHTNING EVENTS, 2-1-14  
 BRAKING ACTION, 3-3-2  
 BRAKING ACTION ADVISORIES, 3-3-2

**C**

Canadian Airspace Procedures, 12-1-1  
 CANCELLATION OF IFR FLIGHT PLAN, 4-2-4  
 CANCELLATION OF TAKEOFF CLEARANCE,  
 3-9-13  
 Caribbean ICAO Region, 8-8-1  
 CELESTIAL NAVIGATION TRAINING, 9-2-1  
 CHARTED VISUAL FLIGHT PROCEDURES  
 (CVFP). USA/USN NOT APPLICABLE, 7-4-4  
 CIRCLING APPROACH, 4-8-7  
 CLASS A AIRSPACE, 9-7-1  
 CLASS A AIRSPACE RESTRICTIONS, 7-1-1  
 CLASS B AIRSPACE, 9-7-1  
 CLASS B SEPARATION, 7-9-2

**[References are to page numbers]**

Class B Service Area (Terminal), 7-9-1  
 CLASS C AIRSPACE, 9-7-1  
 CLASS C SEPARATION, 7-8-1  
 Class C Service (Terminal), 7-8-1  
 CLASS C SERVICES, 7-8-1  
 CLASS D AIRSPACE, 9-7-1  
 CLASS G AIRSPACE, 4-4-3  
 CLEARANCE BEYOND FIX, 4-6-2  
 CLEARANCE FOR VISUAL APPROACH, 7-4-1  
 CLEARANCE INFORMATION (ARRIVALS), 4-7-1  
 CLEARANCE ITEMS, 4-2-1, 4-2-3  
 CLEARANCE LIMIT, 4-8-7  
 CLEARANCE PREFIX, 4-2-1  
 CLEARANCE RELAY, 4-2-1  
 Clearance Status (Strips), 2-3-10  
 CLEARANCE TO HOLDING FIX, 4-6-1  
 CLEARANCE VOID TIMES, 4-3-6  
 Clearances, 4-2-1  
 CLIMB TO VFR, 7-5-3  
 CLOSED RUNWAY INFORMATION, 3-3-1  
 CLOSED TRAFFIC, 3-10-9  
 COAST TRACKS, 5-14-3  
 CODE MONITOR, 5-2-5  
 COMMUNICATION TRANSFER, 5-12-2  
 COMMUNICATIONS CHECK, 5-10-4  
 COMMUNICATIONS FAILURE, 10-4-1  
 COMMUNICATIONS RELEASE, 4-8-8  
 COMPOSITE SEPARATION ALTITUDE  
 ASSIGNMENT, 8-9-3  
 COMPOSITE SEPARATION APPLICATION, 8-9-3  
 COMPOSITE SEPARATION MINIMA, 8-9-3  
 COMPUTER ENTRY OF FLIGHT PLAN  
 INFORMATION, 5-14-2  
 COMPUTER MESSAGE VERIFICATION, 2-2-2  
 CONFLICT ALERT (CA), 5-14-1  
 CONFLICT ALERT/MODE C INTRUDER (MCI)  
 (ARTS), 5-15-2  
 CONFLICT DETECTION AND RESOLUTION,  
 13-1-1, 13-2-1

CONFLICT PROBE-BASED CLEARANCES, 13-1-1  
 CONSTRAINTS GOVERNING SUPPLEMENTS AND  
 PROCEDURAL DEVIATIONS, 1-1-2  
 CONTINGENCIES IN OCEANIC CONTROLLED  
 AIRSPACE, 8-9-4  
 CONTROL ESTIMATES, 8-1-1  
 Control Symbolology (Strip), 2-3-12  
 CONTROL TRANSFER, 2-1-7, 7-6-2  
 CONTROLLER INITIATED COAST TRACKS,  
 5-14-3  
 CONTROLLER PILOT DATA LINK  
 COMMUNICATIONS, 13-2-3  
 Controller Pilot Data Link Communications (CPDLC),  
 2-4-4, 4-5-4  
 COORDINATE USE OF AIRSPACE, 2-1-7  
 COORDINATION BETWEEN LOCAL AND  
 GROUND CONTROLLERS, 3-1-2  
 COORDINATION WITH RECEIVING FACILITY,  
 4-3-8  
 COURSE DEFINITIONS, 1-2-2  
 COURSE DIVERGENCE, 8-5-1  
 CPDLC, 13-2-3  
 CROSSING ALTITUDE, 4-1-2  
 CURRENCY OF TRAJECTORY INFORMATION,  
 13-1-5  
 CURRENT SETTINGS, 2-7-1  
 CVFP, 7-4-4

**D**

DC SFRA, 9-2-4  
 DECISION HEIGHT, 5-12-1  
 DECISION HEIGHT (DH) NOTIFICATION, 5-12-1  
 Decision Support Tools, 13-1-1  
 DEGREE-DISTANCE ROUTE DEFINITION FOR  
 MILITARY OPERATIONS, 4-4-3  
 DELAY SEQUENCING, 4-3-8  
 DELAYS, 4-6-2  
 DELIVERY INSTRUCTIONS, 4-2-1  
 DEPARTMENT OF ENERGY (DOE) SPECIAL  
 FLIGHTS, 9-2-1  
 DEPARTURE AND ARRIVAL, 5-8-3

**[References are to page numbers]**

DEPARTURE CLEARANCE/COMMUNICATION  
FAILURE, 12-1-2

DEPARTURE CLEARANCES, 4-3-1

DEPARTURE CONTROL INSTRUCTIONS, 3-9-2

DEPARTURE DELAY INFORMATION, 3-9-1

DEPARTURE INFORMATION, 3-9-1

Departure Procedures, 4-3-1

Departure Procedures and Separation (ATCT), 3-9-1

DEPARTURE RESTRICTIONS, 4-3-6

DEPARTURE SEPARATION, 3-12-1

DEPARTURE TERMINOLOGY, 4-3-1

DEPARTURES AND ARRIVALS ON PARALLEL OR  
NONINTERSECTING DIVERGING RUNWAYS,  
5-8-3

DERELICT BALLOONS, 9-6-2

DESCENT INSTRUCTION, 5-12-1

DESCENT INSTRUCTIONS, 5-11-1

DESCENT NOTIFICATION, 5-11-1

DEVIATION ADVISORIES, 5-1-4

DIRECT CLEARANCES, 4-4-4

DISCRETE ENVIRONMENT, 5-2-1

DISSEMINATING OFFICIAL WEATHER  
INFORMATION, 2-6-5

DISTANCE FROM TOUCHDOWN, 5-12-1

DL, 13-1-1

DME ARC MINIMA, 6-5-2

DOE, 9-2-1

DUPLICATE POSITION REPORTS, 6-1-1

DUTY PRIORITY, 2-1-1

**E**

E-MSAW, 5-14-1

EDGE OF SCOPE, 5-5-7

ELECTRONIC ATTACK (EA) ACTIVITY, 5-1-2

ELECTRONIC CURSOR, 5-1-3

ELEVATION FAILURE, 5-12-2

ELT, 10-2-3

Emergencies, 10-1-1

EMERGENCY AIRPORT RECOMMENDATION,  
10-2-6

Emergency Assistance, 10-2-1

EMERGENCY CODE ASSIGNMENT, 5-2-3

Emergency Control Actions, 10-4-1

EMERGENCY DETERMINATIONS, 10-1-1

EMERGENCY LANDING PATTERN (ELP)  
OPERATIONS, 3-10-10

EMERGENCY LIGHTING, 3-4-1

EMERGENCY LOCATOR TRANSMITTER (ELT)  
SIGNALS, 10-2-3

EMERGENCY OBSTRUCTION VIDEO MAP  
(EOVM), 10-2-6

Emergency Procedures (Oceanic), 10-6-1

EMERGENCY SITUATIONS, 10-2-1

EMPHASIS FOR CLARITY, 2-4-4

En Route Data Entries (Strips), 2-3-3

EN ROUTE FOURTH LINE DATA BLOCK USAGE,  
5-4-5

EN ROUTE MINIMUM SAFE ALTITUDE WARNING  
(E-MSAW), 5-14-1

EN ROUTE OR OCEANIC SECTOR TEAM  
POSITION RESPONSIBILITIES, 2-10-1

EN ROUTE TARGET MARKERS, 5-3-3

ENTRY OF REPORTED ALTITUDE, 5-14-2

EOVM, 10-2-6

EQUIPMENT USAGE, 3-6-1

ERAM COMPUTER ENTRY OF HOLD  
INFORMATION, 5-14-3

ERAM Decision Support Tools (EDST), 13-1-1

ERAM VISUAL INDICATOR OF SPECIAL  
ACTIVITY AIRSPACE (SAA) STATUS, 5-14-3

ESTABLISHING TWO-WAY COMMUNICATIONS,  
3-1-6

ESTABLISHING TWO-WAY COMMUNICATIONS,  
7-8-1

EVASIVE ACTION MANEUVER, 9-2-10

EXCEPTIONS, 4-1-1

EXPEDITIOUS COMPLIANCE, 2-1-4

EXPERIMENTAL AIRCRAFT OPERATIONS, 9-2-2

EXPLOSIVE CARGO, 10-5-1

EXPLOSIVE DETECTION K-9 TEAMS, 10-2-5

**[References are to page numbers]**

EXTENDED NOTIFICATION, 10-7-1

**F**

FACILITY IDENTIFICATION, 2-4-8

FAILED TRANSPONDER IN CLASS A AIRSPACE,  
5-2-6FAILURE TO DISPLAY ASSIGNED BEACON  
CODE, 5-2-6

FALSE OR DECEPTIVE COMMUNICATIONS, 2-4-2

FAMILIARIZATION, 2-6-1

FAR FIELD MONITOR (FFM) REMOTE STATUS  
UNIT, 3-3-4

FFM, 3-3-4

FINAL APPROACH ABNORMALITIES, 5-10-5

Final Approach Course Interception, 5-9-1

FINAL APPROACH GUIDANCE, 5-11-1

FINAL APPROACH OBSTACLE CLEARANCE  
SURFACES, 3-7-6

FINAL CONTROLLER CHANGEOVER, 5-10-3

FIX USE, 4-1-2

FLIGHT CHECK AIRCRAFT, 9-1-1

FLIGHT DIRECTION, 4-5-1

Flight Direction Exceptions, 4-5-1

Flight Plans and Control Information, 2-2-1

Flight Progress Strips, 2-3-1

FLIGHT VISIBILITY BELOW ONE MILE, 7-5-4

FLYNET, 9-2-2

FORECAST WINDS, 13-1-6

FORMATION FLIGHTS, 2-1-6

FORWARD DEPARTURE DELAY INFORMATION,  
4-3-8

FORWARDING AMENDED AND UTM DATA, 2-2-3

FORWARDING APPROACH INFORMATION BY  
NONAPPROACH CONTROL FACILITIES,  
3-10-1

FORWARDING DEPARTURE TIMES, 4-3-9

FORWARDING FLIGHT PLAN DATA BETWEEN  
U.S. ARTCCs AND CANADIAN ACCs, 2-2-4

FORWARDING INFORMATION, 2-2-1

FORWARDING VFR DATA, 2-2-1

FREQUENCY CHANGES, 10-2-1

Fuel Dumping, 9-4-1

FUNCTION CODE ASSIGNMENTS, 5-2-2

FUNCTIONAL USE, 5-15-1

FURNISH RVR/RVV VALUES, 2-8-1

**G**

General Control, 2-1-1

GLIDEPATH AND COURSE INFORMATION, 5-12-1

GLIDEPATH NOTIFICATION, 5-12-1

GPD, 13-1-6

Ground Missile Emergencies, 10-7-1

GROUND OPERATIONS, 3-7-5

GROUND OPERATIONS RELATED TO  
THREE/FOUR-HOUR TARMAC RULE, 3-1-6GROUND OPERATIONS WHEN VOLCANIC ASH IS  
PRESENT, 3-1-6

GROUND STOP, 4-3-8

GROUND TRAFFIC MOVEMENT, 3-7-1

GROUND VISIBILITY BELOW ONE MILE, 7-5-3

GUIDANCE TO EMERGENCY AIRPORT, 10-2-6

**H**HAZARDOUS INFLIGHT WEATHER ADVISORY  
SERVICE (HIWAS), 2-6-5

Helicopter Arrival Separation, 3-11-3

HELICOPTER DEPARTURE SEPARATION, 3-11-2

Helicopter Landing Clearance, 3-11-4

Helicopter Operations, 3-11-1

HELICOPTER TAKEOFF CLEARANCE, 3-11-1

HELICOPTER TRAFFIC, 7-7-1, 7-9-2

HIGH INTENSITY RUNWAY LIGHTS, 3-4-4

HIGH SPEED TURNOFF LIGHTS, 3-4-5

HIJACKED AIRCRAFT, 10-2-2

HIRL, 3-4-4

HIRL ASSOCIATED WITH MALSR, 3-4-4

HIRL Changes Affecting RVR, 3-4-4

**[References are to page numbers]**

HIWAS, 2-6-5  
 HOLD FOR RELEASE, 4-3-6  
 HOLDING, 7-6-1, 13-1-2  
 Holding Aircraft, 4-6-1  
 HOLDING FLIGHT PATH DEVIATION, 4-6-3  
 HOLDING INSTRUCTIONS, 4-6-3  
 HOLDING PATTERN SURVEILLANCE, 5-1-4

**I**

ICAO PHONETICS, 2-4-5  
 IDENTIFICATION, 3-6-1  
 IDENTIFICATION STATUS, 5-3-2  
 IFR, 4-1-1  
 IFR – VFR FLIGHTS, 4-2-3  
 IFR AND SVFR MINIMA, 10-7-1  
 IFR FLIGHT PROGRESS DATA, 2-2-1  
 IFR MILITARY TRAINING ROUTES, 9-2-2  
 IFR to VFR Flight Plan Change, 2-2-1  
 ILS PROTECTION/CRITICAL AREAS, 4-6-3  
 INFLIGHT CONTINGENCIES, 10-6-2  
 INFLIGHT DEVIATIONS FROM  
   TRANSPONDER/MODE C REQUIREMENTS  
   BETWEEN 10,000 FEET AND 18,000 FEET,  
   5-2-8  
 INFLIGHT EMERGENCIES INVOLVING MILITARY  
   FIGHTER-TYPE AIRCRAFT, 10-1-2  
 INFLIGHT EQUIPMENT MALFUNCTIONS, 2-1-4  
 INFORMATION TO BE FORWARDED TO ARTCC,  
   10-3-1  
 INFORMATION TO BE FORWARDED TO RCC,  
   10-3-1  
 INFORMATION USAGE, 3-6-1  
 INHIBITING MINIMUM SAFE ALTITUDE  
   WARNING (MSAW), 5-15-2  
 INITIAL CONTACT, 7-6-1  
 Initial Heading, 5-8-1  
 INOPERATIVE INTERRAGATOR, 5-2-6  
 INOPERATIVE OR MALFUNCTIONING ADS-B  
   TRANSMITTER, 5-2-9  
 INTERCEPTOR OPERATIONS, 9-2-4

INTERFACILITY CONNECTIVITY, 13-1-6  
 INTERPHONE MESSAGE FORMAT, 2-4-3  
 INTERPHONE MESSAGE TERMINATION, 2-4-4  
 INTERPHONE TRANSMISSION PRIORITIES, 2-4-2  
 INTERPRETATIONS, 1-1-2  
 INTERSECTING RUNWAY SEPARATION  
   (ARRIVAL), 3-10-3  
 INTERSECTING RUNWAY/INTERSECTING  
   FLIGHT PATH OPERATIONS, 3-9-9  
 INTERVAL MINIMA, 6-7-2  
 ISSUANCE OF EFC, 7-7-1  
 ISSUING WEATHER AND CHAFF AREAS, 2-6-2

**J**

Jettisoning of External Stores, 9-5-1

**K**

K-9 Teams, 10-2-5

**L**

LANDING AREA CONDITION, 3-3-1  
 LANDING CHECK, 5-10-3  
 LANDING CLEARANCE, 3-10-6  
 LANDING CLEARANCE WITHOUT VISUAL  
   OBSERVATION, 3-10-7  
 LANDING INFORMATION, 3-10-1  
 LAST KNOWN POSITION DETERMINATION,  
   10-3-3  
 Lateral Separation (Nonradar), 6-5-1  
 Lateral Separation (Oceanic), 8-4-1  
 LAW ENFORCEMENT OPERATIONS BY CIVIL  
   AND MILITARY ORGANIZATIONS, 9-2-5  
 LEVEL FLIGHT RESTRICTION, 6-7-2  
 Light Signals (ATCT), 3-2-1  
 LIGHTING REQUIREMENTS, 10-4-1  
 LINE UP AND WAIT, 3-9-2  
 LOA, 1-1-2

**[References are to page numbers]**

LOCAL OPERATIONS, 7-5-3

Longitudinal Separation (Nonradar), 6-4-1

Longitudinal Separation (Oceanic), 8-3-1

LOST COMMUNICATIONS, 5-10-2

LOW APPROACH, 4-8-9

LOW APPROACH AND TOUCH-AND-GO, 5-10-4

Low Level Wind Shear/Microburst Advisories, 3-1-3

LOWEST USABLE FLIGHT LEVEL, 4-5-2

LUAW, 3-9-2

**M**

MACH NUMBER TECHNIQUE, 8-3-2

MALFUNCTIONING INTERROGATOR, 5-2-6

MALFUNCTIONING TRANSPONDER, 5-2-6

MALSR/ODALS, 3-4-2

Man-Portable Air Defense Systems (MANPADS) Alert,  
10-2-5

MANPADS ALERT, 10-2-5

MANUAL COORDINATION AND THE URET  
COORDINATION MENU, 13-1-2MANUAL INPUT OF COMPUTER-ASSIGNED  
BEACON CODES, 2-2-2

MARSA, 2-1-6

MEA, 4-5-2

MEDIUM INTENSITY RUNWAY LIGHTS, 3-4-4

MERGING TARGET PROCEDURES, 5-1-3

SPEED ADJUSTMENT – METHODS, 5-7-2

MILITARY AERIAL REFUELING, 9-2-6

MILITARY DVFR DEPARTURES, 2-2-1

MILITARY OPERATIONS ABOVE FL 600, 9-2-7

MILITARY PROCEDURES, 2-1-6

MILITARY SINGLE FREQUENCY APPROACHES,  
5-10-5

MILITARY SPECIAL USE FREQUENCIES, 9-2-8

MILITARY TURBOJET EN ROUTE DESCENT,  
4-7-2MINIMA ALONG OTHER THAN ESTABLISHED  
AIRWAYS OR ROUTES, 6-5-2

MINIMA ON DIVERGING COURSES, 6-2-1

MINIMA ON DIVERGING RADIALS, 6-5-1

MINIMA ON OPPOSITE COURSES, 6-4-5

MINIMA ON SAME COURSE, 6-2-3

MINIMA ON SAME, CONVERGING, OR CROSSING  
COURSES, 6-4-1

MINIMUM EN ROUTE ALTITUDES, 4-5-2

MINIMUM FUEL, 2-1-5

MIRL, 3-4-4

Miscellaneous Operations, 10-5-1

MISSED APPROACH, 4-8-8, 5-10-4

MISSED APPROACHES, 6-7-2

MIXED ENVIRONMENT, 5-2-1

MODE C INTRUDER (MCI) ALERT, 5-14-1

MONITOR AVAILABILITY, 5-13-1

MONITOR INFORMATION, 5-13-1

MONITOR ON PAR EQUIPMENT, 5-13-1

MONITORING RADIOS, 2-4-1

MSAW, 5-15-2

**N**

NAT, 8-7-3

NAVAID FIXES, 2-5-2

NAVAID MALFUNCTIONS, 2-1-5

NAVAID TERMS, 2-5-1

NAVAID Use Limitations, 4-1-1

NO-GYRO APPROACH, 5-10-2

NONDISCRETE ENVIRONMENT, 5-2-1

NONINTERSECTING CONVERGING RUNWAY  
OPERATIONS, 3-9-10

Nonradar, 6-1-1

Nonradar Initial Separation of Departing and Arriving  
Aircraft, 6-3-1Nonradar Initial Separation of Successive Departing  
Aircraft, 6-2-1

Nonradar Timed Approaches, 6-7-1

NONRECEIPT OF POSITION REPORT, 6-1-1

NONSTANDARD FORMATION/CELL  
OPERATIONS, 9-2-10

NORAD SPECIAL FLIGHTS, 9-2-9

**[References are to page numbers]**

North American ICAO Region, 8-10-1  
 NORTH AMERICAN ROUTE PROGRAM (NRP)  
 INFORMATION, 2-2-5  
 North Atlantic ICAO Region, 8-7-1  
 NOTES, 1-2-2  
 NRP, 2-2-5  
 NUMBER CLARIFICATION, 2-4-7  
 NUMBERS USAGE, 2-4-5

**O**

OBSERVED ABNORMALITIES, 3-1-5  
 OBSTRUCTION LIGHTS, 3-4-5  
 Oceanic Coordination, 8-2-1  
 Oceanic Data Entries, 2-3-5  
 OCEANIC ERROR REPORT PROCEDURES, 8-1-1  
 Oceanic Procedures, 8-1-1  
 Oceanic Transition Procedures, 8-5-1  
 OCS, 3-7-6  
 Offshore Procedures, 8-1-1  
 Offshore Transition Procedures, 8-5-1  
 ONE THOUSAND-ON-TOP, 12-1-1  
 OPEN SKIES TREATY AIRCRAFT, 9-2-10  
 OPERATIONAL PRIORITY, 2-1-2  
 OPERATIONAL REQUESTS, 2-1-9  
 OPERATIONS IN OFFSHORE AIRSPACE AREAS,  
 8-1-1  
 OPPOSITE DIRECTION, 8-5-1  
 OTHER CONTROL AIRSPACE, 9-7-1  
 OVERDUE AIRCRAFT, 10-3-1, 13-1-5  
 OVERDUE AIRCRAFT/OTHER SITUATIONS,  
 10-3-1  
 OVERHEAD MANEUVER, 3-10-9

**P**

Pacific ICAO Region, 8-9-1  
 PAPI, 3-4-1  
 PAR Approaches – Terminal, 5-12-1  
 PARACHUTE JUMPING, 12-1-2

Parachute Operations, 9-7-1  
 PASSING OR DIVERGING, 5-5-5  
 PHASES OF EMERGENCY, 10-6-1  
 PILOT ACKNOWLEDGMENT/READ BACK, 2-4-1  
 PILOT DEVIATION NOTIFICATION, 2-1-12  
 PIREP SOLICITATION AND DISSEMINATION,  
 2-6-1  
 POFZ, 3-7-6  
 POINT OUT, 5-4-4  
 POSITION ADVISORIES, 5-12-1  
 Position Determination (Airports), 3-1-3  
 POSITION INFORMATION, 5-3-2, 5-10-3  
 Position Report (Oceanic), 8-1-1  
 POSITION REPORTING (RADAR), 5-1-4  
 Position Responsibilities, 2-10-1  
 PRACTICE APPROACHES, 4-8-8  
 PRACTICE PRECAUTIONARY APPROACHES,  
 3-10-10  
 PREARRANGED COORDINATION, 5-4-5  
 PRECISION APPROACH CRITICAL AREA, 3-7-5  
 PRECISION APPROACH PATH INDICATORS (PAPI),  
 3-4-1  
 PRECISION OBSTACLE FREE ZONE, 3-7-6  
 PRESENTATION AND EQUIPMENT  
 PERFORMANCE, 5-1-1  
 PREVENTIVE CONTROL, 3-1-1  
 PRIMARY HOST OUTAGES, 13-1-6  
 PRIMARY RADAR IDENTIFICATION METHODS,  
 5-3-1  
 PRIORITY INTERRUPTION, 2-4-3  
 PROCEDURAL LETTERS OF AGREEMENT (LOA),  
 1-1-2  
 PROCEDURAL PREFERENCE, 2-1-2  
 PROCEDURES FOR WEATHER DEVIATIONS IN  
 NORTH ATLANTIC (NAT) AIRSPACE, 8-7-3  
 PROVIDE SERVICE, 3-1-1

**Q**

QUESTIONABLE IDENTIFICATION, 5-3-2



**[References are to page numbers]****R**

Radar, 5-1-1  
 Radar Approaches – Terminal, 5-10-1  
 Radar Arrivals, 5-9-1  
 RADAR ASSISTANCE TECHNIQUES, 10-2-3  
 RADAR ASSISTANCE TO VFR AIRCRAFT IN WEATHER DIFFICULTY, 10-2-2  
 RADAR BEACON CHANGES FOR MILITARY AIRCRAFT, 4-7-2  
 RADAR BEACON CODE CHANGES, 5-2-2  
 RADAR CONTACT LOST, 5-10-3  
 Radar Departures, 5-8-1  
 RADAR FIX POSTING, 5-1-4  
 Radar Identification, 5-3-1  
 RADAR IDENTIFICATION APPLICATION, 8-5-2  
 Radar Separation, 5-5-1  
 Radar Separation Application, 5-5-1  
 RADAR SEPARATION MINIMA, 5-5-2  
 RADAR SEPARATION VERTICAL APPLICATION, 5-5-5  
 RADAR SERVICE TERMINATION, 5-1-4  
 RADAR-ONLY MODE, 3-6-2  
 Radio and Interphone Communications, 2-4-1  
 RADIO COMMUNICATIONS, 2-1-8, 2-4-1  
 RADIO FAILURE, 5-2-3  
 RADIO FREQUENCY FOR MILITARY AIRCRAFT, 4-7-2  
 RADIO MESSAGE FORMAT, 2-4-2  
 RCC, 10-3-2  
 Receiver-Only Acknowledgment (ATCT), 3-2-1  
 RECEIVING CONTROLLER HANDOFF, 5-4-3  
 RECORDING INFORMATION, 2-2-1  
 RECORDING OF CONTROL DATA, 13-1-2  
 REDUCED VERTICAL SEPARATION MINIMUM (RVSM), 2-1-13  
 REDUCTION OF ROUTE PROTECTED AIRSPACE, 8-4-3  
 REFERENCES, 1-2-3  
 REFUSAL OF AVOIDANCE CLEARANCE, 8-6-1

REIL, 3-4-1  
 RELAYED APPROACH CLEARANCE, 4-8-7  
 RELEASE TIMES, 4-3-6  
 REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT, 10-2-7  
 REPORTING ESSENTIAL FLIGHT INFORMATION, 2-1-5  
 REPORTING WEATHER CONDITIONS, 2-6-2  
 RESEARCH AND DEVELOPMENT FLIGHTS, 9-2-2  
 RESPONSIBILITY TRANSFER TO RCC, 10-3-2  
 RNAV AIRCRAFT ALONG VOR AIRWAYS/ROUTES, 6-4-6  
 RNAV MINIMA- DIVERGING/CROSSING COURSES, 6-5-4  
 ROTATING BEACON, 3-4-5  
 ROUTE AMENDMENTS, 4-2-1  
 Route and NAVAID Description, 2-5-1  
 Route Assignment, 4-4-1  
 ROUTE STRUCTURE TRANSITIONS, 4-4-2  
 ROUTE USE, 4-4-1  
 RUNWAY EDGE LIGHTS, 3-4-3  
 RUNWAY END IDENTIFIER LIGHTS, 3-4-1  
 RUNWAY EXITING, 3-10-8  
 RUNWAY PROXIMITY, 3-7-5  
 Runway Selection, 3-5-1  
 RUNWAY STATUS LIGHTS (RWSL), 3-4-5  
 RVR, 2-8-1  
 RVR/RVV, 2-8-1  
 RVSM, 2-1-13  
 RVSM OPERATIONS, 8-1-1  
 RVV, 2-8-1  
 RWSL, 3-4-5

**S**

SAA, 5-14-3  
 SAFETY ALERT, 2-1-4  
 SAFETY LOGIC ALERT RESPONSES, 3-6-1  
 SAFETY MANAGEMENT SYSTEM (SMS), 1-1-3  
 SAME DIRECTION, 8-5-2

**[References are to page numbers]**

SAME RUNWAY SEPARATION, 3-9-4  
 SAME RUNWAY SEPARATION (ARRIVAL), 3-10-2  
 SAMP, 9-2-9  
 SAR, 10-3-1  
 SATR, 9-2-4  
 Sea Lane Operations, 3-12-1  
 Search and Rescue, 10-3-1  
 SECNOT, 9-2-5  
 SECTOR ELIGIBILITY, 5-14-2  
 SECURITY NOTICE (SECNOT), 9-2-5  
 SELECTED ALTITUDE LIMITS, 5-14-2  
 SELECTION, 3-5-1  
 SEPARATION BY PILOTS, 6-4-6, 6-6-1  
 Separation from Airspace Reservations, 8-6-1  
 SEPARATION FROM OBSTRUCTIONS, 5-5-7  
 SEPARATION METHODS, 6-5-1, 8-4-1  
 SEPARATION MINIMA, 6-3-1  
 SEQUENCE INTERRUPTION, 6-7-2  
 Sequence/Spacing Application, 3-8-1  
 SEQUENCED FLASHING LIGHTS (SFL), 3-4-2  
 SERVICE LIMITATIONS (RADAR), 5-1-3  
 SERVICE PROVIDED WHEN TOWER IS INOPERATIVE, 7-6-3  
 SERVICES TO RESCUE AIRCRAFT, 10-6-3  
 SFA, 4-7-1  
 SFL, 3-4-2  
 SFRA, 9-2-4  
 SIDE-STEP MANEUVER, 4-8-7  
 SIMULATED FLAMEOUT (SFO) APPROACHES, 3-10-10  
 SIMULTANEOUS DEPARTURES, 5-8-1  
 SIMULTANEOUS DEPENDENT APPROACHES, 5-9-5  
 SIMULTANEOUS INDEPENDENT APPROACHES TO WIDELY-SPACED PARALLEL RUNWAYS WITHOUT FINAL MONITORS, 5-9-12  
 SIMULTANEOUS INDEPENDENT APPROACHES-DUAL & TRIPLE, 5-9-6  
 SIMULTANEOUS INDEPENDENT CLOSE PARALLEL APPROACHES -PRECISION  
 RUNWAY MONITOR (PRM) APPROACHES, 5-9-8  
 Simultaneous Landings or Takeoffs (Helicopter), 3-11-3  
 SIMULTANEOUS OFFSET INSTRUMENT APPROACHES (SOIA)- HIGH UPDATE RADAR, 5-9-9  
 SIMULTANEOUS OPPOSITE DIRECTION OPERATION, 3-8-2  
 Simultaneous Same Direction Operation, 3-8-1  
 SINGLE FREQUENCY APPROACHES, 4-7-1  
 SMOKE COLUMN AVOIDANCE, 10-7-1  
 SMS, 1-1-3  
 Spacing and Sequencing (ATCT), 3-8-1  
 SPECIAL ACTIVITY AIRSPACE, 5-14-3  
 SPECIAL AIR TRAFFIC RULES (SATR) AND SPECIAL FLIGHT RULES AREA (SFRA), 9-2-4  
 Special Flights, 9-1-1  
 SPECIAL HANDLING, 9-1-1  
 SPECIAL INTEREST SITES, 9-2-4  
 Special Operations, 9-2-1  
 Special Use Airspace, 9-3-1  
 Special VFR, 7-5-1  
 SPECIAL VFR (SVFR), 12-1-2  
 SPECIFYING ALTITUDE, 4-8-7  
 Speed Adjustment, 5-7-1  
 SPEED ASSIGNMENTS, 5-7-3  
 Standard Operating Practice (SOP) for Aircraft Deviating for Weather Near Active Special Activity Airspace (SAA), Appendix B-1  
 STANDBY OR LOW SENSITIVITY OPERATION, 5-2-5  
 STOL RUNWAYS, 3-5-1  
 Stop-and-Go Low Approach, 3-8-1  
 SUCCESSIVE DEPARTURES, 5-8-1  
 SUPERVISORY NOTIFICATION, 2-1-12  
 SURFACE AREA RESTRICTIONS, 3-1-6  
 SURFACE AREAS, 2-1-7  
 Surveillance Approaches - Terminal, 5-11-1  
 SURVEILLANCE UNUSABLE, 5-12-3  
 SVFR, 7-5-1, 12-1-2

**[References are to page numbers]**

SWITCHING ILS RUNWAYS, 4-7-6

**T**

TAILWIND COMPONENTS, 3-5-1

TAKEOFF CLEARANCE, 3-9-12

TARGET RESOLUTION, 5-5-2

TARGET SEPARATION, 5-5-1

TAWS, 2-1-14

TAXI AND GROUND MOVEMENT OPERATION,  
3-11-1TAXI AND GROUND MOVEMENT OPERATIONS,  
3-7-2

Taxi and Ground Movement Procedures, 3-7-1

TAXIWAY LIGHTS, 3-4-5

TBFM, 11-1-2

TCAS RESOLUTION ADVISORIES, 2-1-12

TEAM RESPONSIBILITIES – MULTIPLE PERSON  
OPERATION, 13-2-4TELETYPE FLIGHT DATA FORMAT– U.S. ARTCCs  
– CANADIAN ACCs, 2-2-4TEMPORARY MOVING AIRSPACE  
RESERVATIONS, 8-6-1TEMPORARY STATIONARY AIRSPACE  
RESERVATIONS, 8-6-1

TERMINAL – TARGET MARKERS, 5-3-3

TERMINAL AUTOMATION SYSTEMS  
IDENTIFICATION METHODS, 5-3-2

Terminal Data Entries (Strips), 2-3-6

Terminal Radar Service Area, 7-7-1

TERMINAL RADAR/NONRADAR TEAM POSITION  
RESPONSIBILITIES, 2-10-2

SPEED ADJUSTMENT – TERMINATION , 5-7-4

TERMINOLOGY, 2-8-1

TERMS – TRANSFER OF RADAR  
IDENTIFICATION, 5-4-1

Terms of Reference, 1-2-1

TERRAIN AWARENESS WARNING SYSTEM  
(TAWS) ALERTS, 2-1-14THE AIRCRAFT LIST (ACL), DEPARTURE LIST  
(DL) AND FLIGHT DATA MANAGEMENT,  
13-1-1

THROUGH CLEARANCES, 4-2-3

TIME BASED FLOW MANAGEMENT (TBFM),  
11-1-2

TIME CHECK, 6-7-2

TIMELY INFORMATION, 3-3-2

Touch-and-Go Low Approach, 3-8-1

TOUCH-AND-GO, 4-8-9

TOUCHDOWN ZONE LIGHTS, 3-4-4

TOWER CLEARANCE, 5-10-4

TOWER TEAM POSITION RESPONSIBILITIES,  
2-10-4

TRACK SEPARATION, 8-4-4

TRACK SUSPEND FUNCTION, 5-15-2

TRAFFIC ADVISORIES, 2-1-10

TRAFFIC INFORMATION, 3-1-2

Traffic Management Procedures, 11-1-1

TRAFFIC RESTRICTIONS, 10-4-1

TRAFFIC RESUMPTION, 10-4-1

TRAFFIC – TRANSFER OF RADAR  
IDENTIFICATION, 5-4-2TRANSFER OF CONTROL AND  
COMMUNICATIONS, 8-2-1

TRANSFER OF JURISDICTION, 4-7-4

Transfer of Position (SOP), Appendix A-1

TRANSFER OF POSITION RESPONSIBILITY,  
2-1-12

Transfer of Radar Identification, 5-4-1

TRANSFER OR RADAR IDENTIFICATION –  
METHODS, 5-4-1

TRANSFERRING CONTROLLER HANDOFF, 5-4-2

TRANSITING ACTIVE SUA/ATCAA, 9-3-2

TRANSITIONAL PROCEDURE, 5-9-13

TRANSMISSION ACKNOWLEDGMENT, 5-10-4

TRANSMIT PROPOSED FLIGHT PLAN, 2-2-3

TRIAL PLANNING, 13-1-1

TRSA, 7-7-1

TRSA DEPARTURE INFORMATION, 7-7-1

TRSA SEPARATION, 7-7-1

TYPES OF SEPARATION, 8-1-1

**U**

UAS, 2-1-11

**[References are to page numbers]**

UFO, 9-8-1  
 UNAUTHORIZED LASER ILLUMINATION OF  
 AIRCRAFT, 2-9-2, 10-2-5  
 Unidentified Flying Object (UFO) Reports, 9-8-1  
 UNMANNED AIRCRAFT SYSTEM (UAS)  
 ACTIVITY INFORMATION., 2-1-11  
 UNMANNED AIRCRAFT SYSTEMS (UAS) LOST  
 LINK, 5-2-3  
 Unmanned Free Balloons, 9-6-1  
 UNMONITORED NAVAIDS, 4-6-3  
 UNSAFE RUNWAY INFORMATION, 3-3-1  
 URET AIRSPACE CONFIGURATION ELEMENTS,  
 13-1-6  
 USAF/USN Undergraduate Pilots (Strips), 2-3-10  
 USE OF ACTIVE RUNWAYS, 3-1-1  
 USE OF GRAPHICS PLAN DISPLAY (GPD), 13-1-6  
 USE OF MARSA, 2-1-6  
 Use of PAR for Approach Monitoring – Terminal,  
 5-13-1  
 USE OF TOWER RADAR DISPLAYS, 3-1-5  
 User Request Evaluation Tool (URET), 13-1-1

**V**

VALIDATION OF MODE C READOUT, 5-2-6  
 VASI, 3-4-1  
 Vectoring, 5-6-1  
 VECTORS ACROSS FINAL APPROACH COURSE,  
 5-9-2  
 VECTORS BELOW MINIMUM ALTITUDE, 5-6-2  
 VECTORS FOR VISUAL APPROACH, 7-4-1  
 VECTORS TO FINAL APPROACH COURSE, 5-9-1  
 VEHICLES/EQUIPMENT/PERSONNEL NEAR/ON  
 RUNWAYS, 3-1-2  
 VERTICAL APPLICATION EXCEPTIONS, 5-5-5  
 Vertical Separation (Nonradar), 6-6-1  
 VERTICAL SEPARATION MINIMA, 4-5-1  
 VFR – IFR FLIGHTS, 4-2-3  
 VFR AIRCRAFT IN CLASS B AIRSPACE, 7-9-1  
 VFR AIRCRAFT IN WEATHER DIFFICULTY,  
 10-2-2

VFR Basic Radar Service (Terminal), 7-6-1  
 VFR CLIMB AND DESCENT, 8-8-3  
 VFR CODE ASSIGNMENTS, 5-2-4  
 VFR CONDITIONS, 7-1-1  
 VFR DEPARTURE INFORMATION, 7-6-2  
 VFR FLIGHT PLANS, 8-1-1  
 VFR MINIMA, 10-7-1  
 VFR RELEASE OF IFR DEPARTURE, 4-3-8  
 VFR-ON-TOP, 7-3-1  
 VFR-ON-TOP (NAVAID), 4-1-2  
 Visual, 7-1-1  
 VISUAL APPROACH SLOPE INDICATORS, 3-4-1  
 Visual Approaches, 7-4-1  
 VISUAL HOLDING OF VFR AIRCRAFT, 7-1-1  
 VISUAL HOLDING POINTS, 4-6-3  
 VISUAL REFERENCE REPORT, 5-11-1  
 VISUAL SEPARATION, 7-2-1  
 Visual Signals (ATCT), 3-2-1  
 VISUALLY SCANNING RUNWAYS, 3-1-6  
 VOLCANIC ASH, 10-2-6

**W**

WAKE TURBULENCE, 2-1-9  
 WAKE TURBULENCE CAUTIONARY  
 ADVISORIES, 2-1-10  
 WAKE TURBULENCE SEPARATION FOR  
 INTERSECTION DEPARTURES, 3-9-7  
 Warning Signal (ATCT), 3-2-1  
 WEATHER DEVIATIONS, 8-9-4  
 Weather Deviations in North Atlantic (NAT) Airspace,  
 8-7-3  
 Weather Information, 2-6-1  
 WEATHER INFORMATION (ARRIVALS), 4-7-3  
 WEATHER RECONNAISSANCE FLIGHTS, 9-2-9  
 WHEELS DOWN CHECK, 2-1-12  
 WITHHOLDING LANDING CLEARANCE, 3-10-8  
 WORD MEANINGS, 1-2-1  
 Words and Phrases (Communications), 2-4-4

# **BRIEFING GUIDE**

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

## Table of Contents

<b>Paragraph Number</b>	<b>Title</b>	<b>Page</b>
2-1-4	OPERATIONAL PRIORITY .....	BG-3
2-6-4	ISSUING WEATHER AND CHAFF AREAS .....	BG-3
3-3-7	FAR FIELD MONITOR (FFM) REMOTE STATUS UNIT .....	BG-4
3-4-10	RUNWAY EDGE LIGHTS .....	BG-4
3-4-15	SIMULTANEOUS APPROACH AND RUNWAY EDGE LIGHT OPERATION .....	BG-4
3-7-2	TAXI AND GROUND MOVEMENT OPERATIONS .....	BG-5
3-9-4	LINE UP AND WAIT (LUAW) .....	BG-8
5-2-18	VALIDATION OF MODE C READOUT .....	BG-8
5-4-7	POINT OUT .....	BG-9
5-4-8	AUTOMATED INFORMATION TRANSFER (AIT) .....	BG-10
5-4-9	INTERFACILITY AUTOMATED INFORMATION TRANSFER .....	BG-10
5-9-7	SIMULTANEOUS INDEPENDENT APPROACHES- DUAL & TRIPLE ...	BG-12
7-4-3	CLEARANCE FOR VISUAL APPROACH .....	BG-13
9-2-20	WEATHER RECONNAISSANCE FLIGHTS .....	BG-13
9-2-23	OPEN SKIES TREATY AIRCRAFT .....	BG-14
13-1-8	RECORDING OF CONTROL DATA .....	BG-9

**1. PARAGRAPH NUMBER AND TITLE: 2-1-4. OPERATIONAL PRIORITY**

**2. BACKGROUND:** Fallen members of the United States military are often returned home by aircraft. These aircraft can be commercial air carriers, charters, or military flights. Currently, there is no way to identify these flights and no guidance to provide priority handling. We are now providing that guidance and a mechanism for identifying these flights.

**3. CHANGE:**

<u>OLD</u>	<u>NEW</u>
<b>2-1-4. OPERATIONAL PRIORITY</b>	<b>2-1-4. OPERATIONAL PRIORITY</b>
Title through p	No Change
Add	<u><b>q. If able, provide priority handling to FALLEN HERO flights when “FALLEN HERO” is indicated in the remarks section of the flight plan or requested in air/ground communications.</b></u>

---

**1. PARAGRAPH NUMBER AND TITLE: 2-6-4. ISSUING WEATHER AND CHAFF AREAS**

**2. BACKGROUND:** The Central Service Area ATSAP Event Review Committee received an information request on the six STARS weather levels and how to correlate them to the four precipitation intensity levels. STARS, ARTS, and other terminal systems can display six levels of precipitation intensities. FAA Order JO 7110.65, 2-6-4, Issuing Weather and Chaff Areas, subparagraph c, describes four intensities of precipitation: light, moderate, heavy, extreme. The Pilot/Controller Glossary definition of Precipitation Radar Weather Descriptions makes a reference to Advisory Circular 00-45G which once contained the correlation (paragraph 3.3.1.11) of the six levels into four precipitation intensities. However, AC 00-45H, effective November 14, 2016, was updated and that legacy information was removed. The information, which is not accessible to air traffic, is legaced in the STARS Technical Manual, paragraph 3.2.1.1.1.18, Weather Coordinate Conversion and Level Mapping.

**3. CHANGE:**

<u>OLD</u>	<u>NEW</u>
<b>2-6-4. ISSUING WEATHER AND CHAFF AREAS</b>	<b>2-6-4. ISSUING WEATHER AND CHAFF AREAS</b>
Title through <b>c4 REFERENCE</b>	No Change
Add	<u><b>d. TERMINAL: In STARS, ARTS, and other systems that display six levels of precipitation intensities, correlate precipitation descriptors from subparagraph c as follows:</b></u>
Add	<u><b>1. Level 1 = LIGHT</b></u>
Add	<u><b>2. Level 2 = MODERATE</b></u>
Add	<u><b>3. Levels 3 and 4 = HEAVY</b></u>
Add	<u><b>4. Levels 5 and 6 = EXTREME</b></u>
<u><b>d</b></u> through <u><b>k</b></u>	Re-letter <u><b>e</b></u> through <u><b>l</b></u> .

---

**1. PARAGRAPH NUMBER AND TITLE:** 3-3-7. FAR FIELD MONITOR (FFM) REMOTE STATUS UNIT

**2. BACKGROUND:** Technical Operations revised FAA Order 6750.24, Instrument Landing System and Ancillary Electronic Component Configuration and Performance Requirements, on June 14, 2016, altering Appendix A concerning the Instrument Landing System (ILS) category requirements for Far Field Monitor (FFM) remote sensor unit operations. The revision changed the ILS category from a CAT I to a CAT II for remote sensor operations. The corresponding provision in FAA Order JO 7110.65 requires an update to align with the revision in FAA Order 6750.24.

**3. CHANGE:**

<u>OLD</u>	<u>NEW</u>
<b>3-3-7. FAR FIELD MONITOR (FFM) RMEOTE STATUS UNIT</b>	<b>3-3-7. FAR FIELD MONITOR (FFM) RMEOTE STATUS UNIT</b>
Title through c	No Change
d. Operation of the FFM remote sensing unit will be based on the prevailing weather. The FFM remote sensing unit must be operational when the weather is below CAT <u>I</u> ILS minimums.	d. Operation of the FFM remote sensing unit will be based on the prevailing weather. The FFM remote sensing unit must be operational when the weather is below CAT <u>II</u> ILS minimums.
Add	<u>REFERENCE</u> FAA Order 6750.24, Appendix A, Abnormal Checklist

**1. PARAGRAPH NUMBER AND TITLE:**

3-4-10. RUNWAY EDGE LIGHTS

3-4-15. SIMULTANEOUS APPROACH AND RUNWAY EDGE LIGHTS OPERATION

**2. BACKGROUND:** FAA Order JO 7110.65, paragraph 3-4-15, requires controllers to turn on runway edge lights for the runway in use whenever the associated approach lights are on. There are occasions where the runway edge lights are not specifically required yet the approach lights must be on. The applicable setting(s) chart(s) provide the appropriate use and settings criterion.

**3. CHANGE:**

<u>OLD</u>	<u>NEW</u>
<b>3-4-10. RUNWAY EDGE LIGHTS</b>	<b>3-4-10. RUNWAY EDGE LIGHTS</b>
Title through e <i>NOTE</i>	No Change
<u>REFERENCE-</u> FAA Order JO 7110.65, Para 3-4-15, Simultaneous Approach and Runway Edge Light Operation. FAA Order JO 7210.3, Para 10-6-3, Incompatible Light System. FAA Order JO 7210.3, Para 10-6-9, Runway Edge Lights Associated With Medium Approach Light System/Runway Alignment Indicator Lights.	<u>REFERENCE-</u> FAA Order JO 7210.3, Para 10-6-3, Incompatible Light System. FAA Order JO 7210.3, Para 10-6-9, Runway Edge Lights Associated With Medium Approach Light System/Runway Alignment Indicator Lights.
<b><u>3-4-15. SIMULTANEOUS APPROACH AND RUNWAY EDGE LIGHTS OPERATION</u></b>	<b><u>NEW</u></b>
<u>Turn on the runway edge lights for the runway in use whenever the associated approach lights are on. If multiple runway light selection is not possible, you may leave the approach lights on and switch the runway lights to another runway to accommodate another aircraft.</u>	Delete
	Delete



*REFERENCE –  
FAA Order JO 7110.65, Para 3–4–10, Runway Edge Lights.*

Delete

**3–4–16** through **3–4–20**

Renumber **3–4–15** through **3–4–19**.

**1. PARAGRAPH NUMBER AND TITLE: 3–7–2. TAXI AND GROUND MOVEMENT OPERATIONS**

**2. BACKGROUND:** The Runway Safety Call to Action 2015, Summary Report, Phase 2, contains recommendations to mitigate Category A and B Runway Incursions. The report contains a section titled Procedures and Awareness. The events reviewed indicated that procedures and awareness played a significant factor in runway incursions. One of the recommendations was to evaluate explicit taxi instructions contained in FAA Order JO 7110.65, paragraph 3–7–2. The action was to consider adding specificity and reducing ground movement instructions into easily remembered segments. The Root Cause Analysis Team (RCAT) reviews serious runway incursions. After an analysis of multiple events, the RCAT recommended an evaluation of FAA Order JO 7110.65 Paragraph 3–7–2, Taxi and Ground Movement Operations, and suggested the FAA add requirement(s) to provide taxi instructions up to the hold–point/location when taxi instructions are issued. The Risk Mitigation Monitoring Evaluation team conducted an evaluation of the runway–to–runway crossing clearance procedure. Inconsistencies in the interpretation and application of this procedure were discovered. One such inconsistency involved a taxi route or vehicle operation along a runway that intersects with another runway. It was not clear if air traffic control needed to issue a crossing clearance to a vehicle performing a runway operation. Several subject matter experts from the previous 2014 Safety Risk Management Panel met to establish clarity of intent regarding vehicle operations on a runway. While Notice 7110.708 introduced clarifying language to exclude vehicles from participating in multiple runway crossings, the panel never intended to change the industry baseline understanding of vehicle operations on a runway.

**3. CHANGE:**

**OLD**

**3–7–2. TAXI AND GROUND MOVEMENT OPERATIONS**

Issue the route for the aircraft/vehicle to follow on the movement area in concise and easy to understand terms. The taxi clearance must include the specific route to follow. When a taxi clearance to a runway is issued to an aircraft, confirm the aircraft has the correct runway assignment.

**NOTE 1 and NOTE 2**

**a.** When authorizing a vehicle to proceed on the movement area or an aircraft to taxi to any point other than assigned takeoff runway, specify the route/taxi instructions, including specific instructions on where to cross a runway. If it is the intent to hold the aircraft/vehicle short of any given point along the taxi route, issue the route and then state the holding instructions.

Add

Add

**NEW**

**3–7–2. TAXI AND GROUND MOVEMENT OPERATIONS**

Issue the route for the aircraft/vehicle to follow on the movement area in concise and easy to understand terms. The taxi clearance/route must include the specific route to follow. When a taxi clearance to a runway is issued to an aircraft, confirm the aircraft has the correct runway assignment.

No Change

**a.** When authorizing an aircraft to taxi or a vehicle to proceed on the movement area, specify the taxi instructions/route. If it is the intent to hold the aircraft/vehicle short of:

**1. A runway: issue the route up to the runway hold short point. When issuing a runway crossing clearance, include specific instructions on where to cross the runway;**

**2. Any other point along the route, issue:**

Add

Add

Add

**NOTE–**

1. The absence of holding instructions authorizes an aircraft/vehicle to cross all taxiways that intersect the taxi route.

2. Movement of aircraft or vehicles on non–movement areas is the responsibility of the pilot, the aircraft operator, or the airport management.

**PHRASEOLOGY–**  
**HOLD POSITION.**

*HOLD FOR (reason)*

*CROSS (runway/taxiway), at (runway/taxiway)*

*or*

*TAXI/CONTINUE TAXIING/PROCEED[VIA (route),*

*or*

*ON (runway number or taxiways, etc.),*

*or*

*TO (location),*

*or*

*(direction),*

*or*

*ACROSS RUNWAY (number), at (runway/taxiway).*

*or*

*VIA (route), HOLD SHORT OF (location)*

*or*

*FOLLOW (traffic) (restrictions as necessary)*

*or*

*BEHIND (traffic).*

**EXAMPLE–**

**(a) the route up to the hold short point, or**

**(b) the entire route and then state the hold short instructions.**

**After issuing a crossing clearance, specify the taxi instructions/route an aircraft/vehicle is to follow, if not previously issued.**

**NOTE–**

The absence of holding instructions authorizes an aircraft/vehicle to cross all taxiways that intersect the taxi route.

Delete

**PHRASEOLOGY–**  
**HOLD POSITION.**

*HOLD FOR (reason)*

*CROSS (runway), at (runway/taxiway)*

*or*

*TAXI/CONTINUE TAXIING/PROCEED VIA (route),*

*or*

*ON (runway number or taxiways, etc.),*

*or*

*TO (location),*

*or*

*(direction),*

*or*

*ACROSS RUNWAY (number), at (runway/taxiway).*

*or*

*VIA (route), HOLD SHORT OF (location)*

*or*

*FOLLOW (traffic) (restrictions as necessary)*

*or*

*BEHIND (traffic).*

No Change

**b.** When authorizing an aircraft to taxi to an assigned takeoff runway, state the departure runway followed by the specific taxi route. Issue hold short restrictions when an aircraft will be required to hold short of a runway or other points along the taxi route.

**NOTE** through **EXAMPLE**

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

**NOTE** through **d EXAMPLE**

**e.** Vehicles must receive a clearance for each runway their route crosses. A vehicle must have crossed a previous runway before another runway crossing clearance may be issued.

**NOTE–**

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

Add

Add

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

**g1** through **g2 (b)(3)**

Add

**g** through **j**

**b.** When authorizing an aircraft to taxi to an assigned takeoff runway, state the departure runway followed by the specific taxi route. Issue hold short instructions, in accordance with paragraph a above, when an aircraft will be required to hold short of a runway or other points along the taxi route.

No Change

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

No Change

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

No Change

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

**NOTE–**

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

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

No Change

**REFERENCE–**

*FAA Order JO 7110.65, 3–10–4, Intersecting Runway/Intersecting Flight Path Separation*

*FAA Order JO 7210.3, 10–3–7, Land and Hold Short Operations (LAHSO)*

Re–letter **h** through **k**.

j. Issue instructions to aircraft/vehicle to hold short of an approach hold area.

**PHRASEOLOGY–**  
*HOLD SHORT OF (runway) APPROACH*

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

**PHRASEOLOGY–**  
*HOLD SHORT OF (runway) APPROACH*

**HOLD SHORT OF (runway) DEPARTURE**

**1. PARAGRAPH NUMBER AND TITLE: 3–9–4. LINE UP AND WAIT (LUAW)**

**2. BACKGROUND:** Recent data has indicated issues revolving around the use of Line Up and Wait (LUAW). The Vice President of Air Traffic Services tasked AJT–2 to develop a LUAW Collective Work Group to review current requirements with a focus on areas that could be improved and to determine if changes are needed to the LUAW procedures as contained in FAA Order JO 7110.65. AJT–22, Safety and Technical Training AJI, NATCA, and Mission Support Terminal Procedures, AJV–82 met as a LUAW Collective Work Group. The group reviewed current requirements with a focus on areas that could be improved and to determine if changes are needed to the LUAW procedures recommended by the AJT–22 LUAW Advisory Work Group.

**3. CHANGE:**

**OLD**

**3–9–4. LINE UP AND WAIT (LUAW)**

Title through **b PHRASEOLOGY**

Add

**NEW**

**3–9–4. LINE UP AND WAIT (LUAW)**

No Change

**NOTE–**

**When using LUAW, an imminent departure is one that will not be delayed beyond the time that is required to ensure a safe operation. An aircraft should not be in LUAW status for more than 90 seconds without additional instructions.**

**1. PARAGRAPH NUMBER AND TITLE: 5–2–18. VALIDATION OF MODE C READOUT**

**2. BACKGROUND:** A proposal was received to remove the requirement for controllers to validate Mode C readouts after accepting an interfacility handoff between En Route Automation Modernization (ERAM) facilities. FAA Order JO 7110.65, Paragraph 5–2–18, Validation of Mode C Readout, requires controllers to “Ensure that Mode C altitude readouts are valid after accepting an interfacility handoff...” This requirement applies whether or not the facilities are using the same automation platform. According to second level engineering, with a few minor exceptions which do not involve Mode C validation, ERAM processes and shares data interfacility in the same manner as intrafacility – the automation is validating the altitude and providing an indication to the controller when an altitude is deemed invalid, missing, or out of conformance. To enhance the efficiency of air traffic procedures, the guidance in paragraph 5–2–18 should be modified to reflect the capabilities of current equipment.

**3. CHANGE:**

**OLD**

**5–2–18. VALIDATION OF MODE C READOUT**

**NEW**

**5–2–18. VALIDATION OF MODE C READOUT**

Ensure that Mode C altitude readouts are valid after accepting an interfacility handoff, initial track start, track start from coast/suspend tabular list, missing, or unreasonable Mode C readouts. When an X is displayed adjacent to the Mode C, the Mode C altitude readout must be validated after the X is no longer displayed in the data block. (CTRD equipped tower cabs are not required to validate Mode C readouts after receiving interfacility handoffs from TRACONS according to the procedures in Para 5-4-3, Methods, subpara a4.)

Add

Add

Add

Add

Add

a through e

Ensure that Mode C altitude readouts are valid after accepting an interfacility handoff, initial track start, track start from coast/suspend tabular list, or during and after an unreliable Mode C readout, except as follows:

**NOTE-**

**Consider a Mode C readout unreliable when any condition, not just those that display an indicator in the Data Block, exists that indicates that the Mode C may be in error.**

**a. CTRD-equipped tower cabs are not required to validate Mode C altitude readouts after accepting interfacility handoffs from TRACONS according to the procedures in Paragraph 5-4-3, Methods, subparagraph a4.**

**b. ERAM facilities are not required to validate Mode C altitude readouts after accepting interfacility handoffs from other ERAM facilities, except:**

**1. After initial track start or track start from coast is required, or**

**2. During and after the display of a missing, unreasonable, exceptional, or otherwise unreliable Mode C readout indicator.**

Re-letter c through g.

**1. PARAGRAPH NUMBER AND TITLE:**

5-4-7. POINT OUT

13-1-8. RECORDING OF CONTROL DATA

**2. BACKGROUND:** In an effort to reduce verbal coordination and increase efficiency in the National Airspace System (NAS), automated point outs are being introduced into the En Route Automation Modernization (ERAM) platform. After initiating a point out, controllers will be able to view a non-verbal response from the receiving sector via a coordination portal of the full data block or through the En Route Decision Support Tool (EDST).

**3. CHANGE:**

**OLD**

**5-4-7. POINT OUT**

Title through **a**

**NEW**

**5-4-7. POINT OUT**

No Change

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

Add

Add

Add

Add

1. Obtain approval before permitting an aircraft to enter the receiving controller's delegated airspace.

**(a) EN ROUTE: Automated approval may be utilized in lieu of verbal approval. If the receiving controller takes no action, revert to verbal procedures.**

**NOTE–**

**1. Use fourth line data for aircraft not on their flight plan route.**

**2. Where specified in a letter of agreement, some facilities may restrict interfacility automated point outs.**

**REFERENCE–**

**FAA Order JO 7110.65, Para 2–10–1, En Route Or Oceanic Sector Team Responsibilities.**

**FAA Order JO 7110.65, Para 5–4–3, Methods.**

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

**FAA Order JO 7110.65, Para 5–14–3, Computer Entry of Flight Plan Information.**

**(b) TERMINAL: Automated point out approval may be utilized in lieu of verbal provided the procedures are contained in a facility directive/LOA.**

### **OLD**

#### **13–1–8. RECORDING OF CONTROL DATA**

**Title through a**

**b.** When a point out has been approved, remove the yellow color coding on the ACL.

### **NEW**

#### **13–1–8. RECORDING OF CONTROL DATA**

**No Change**

**b.** When a verbal point out has been approved, remove the yellow color coding on the ACL.

#### **1. PARAGRAPH NUMBER AND TITLE:**

5–4–8. AUTOMATED INFORMATION TRANSFER (AIT)

5–4–9. INTERFACILITY AUTOMATED INFORMATION TRANSFER

**2. BACKGROUND:** The question has been raised from an En Route facility whether the provisions of FAA Order JO 7110.65, Paragraph 5–4–10, Prearranged Coordination, could be used in the Interfacility En Route environment with climbing or descending aircraft. In studying the particular request, we believe it would more appropriately be covered by FAA Order JO 7110.65, Paragraph 5–4–9, Interfacility Automated Information Transfer. However, use of paragraph 5–4–9 is authorized only for transfer of radar identification of aircraft "at assigned altitude in level flight." In researching the history of paragraph 5–4–9, we can find no reason for the inclusion of such a limitation. Additionally, ERAM automation has expanded the types of interfacility information which can be coordinated bi-directionally via full data blocks to more than just radar identification. Deleting paragraph 5–4–9 will allow the use of Automated Information Transfer in many situations where an operational advantage can be gained, thus reducing controller and pilot workload and frequency congestion, and simplifying FAA Order JO 7110.65.

**3. CHANGE:**

**OLD**

**5-4-8. AUTOMATED INFORMATION TRANSFER (AIT)**

Title through b

c. Within the same facility, except as provided in Paragraph 5-4-9, Interfacility Automated Information Transfer; and

d. When following procedures specified in your facility AIT directive.

Add

**REFERENCE-**  
 FAA Order JO 7110.65, Para 5-4-11, En Route Fourth Line Data Block Usage.

**OLD**

**5-4-9. INTERFACILITY AUTOMATED INFORMATION TRANSFER**

EN ROUTE

Transfer radar identification without verbal coordination under the following conditions:

a. During radar handoff; and

b. Via information displayed in full data blocks; and

c. On aircraft at assigned altitude in level flight; and

d. Only the first sector within the receiving facility must utilize the procedure; and

e. When following procedures specified in your facility AIT directive and LOA.

**5-4-10**

**NEW**

**5-4-8. AUTOMATED INFORMATION TRANSFER (AIT)**

No Change

Delete

c. When following procedures specified in your facility AIT directive **and/or LOA.**

**NOTE-**

**Information transferred using AIT procedures may be bi-directional, and may involve more than two sectors. Complete coordination, awareness of traffic flow, and understanding of each position's responsibilities concerning AIT procedures cannot be overemphasized.**

**REFERENCE-**  
 FAA Order JO 7110.65, Para 5-4-10, En Route Fourth Line Data Block Usage.  
**FAA Order JO 7210.3, Para 4-3-8, Automated Information Transfer (AIT)**

**NEW**

Delete

Delete

Delete

Delete

Delete

Delete

Delete

Delete

Rename **5-4-9.**

**OLD****5-4-11. EN ROUTE FOURTH LINE DATA BLOCK USAGE**

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

**REFERENCE-**

FAA Order JO 7110.65, Para 5-4-5, Transferring Controller Handoff, subpara b.

FAA Order JO 7110.65, Para 5-4-8, Automated Information Transfer (AIT).

FAA Order JO 7110.65, Para 5-4-9, Interfacility Automated Information Transfer.

**b through h EXAMPLE****REFERENCE-**

FAA Order JO 7110.65, Para 5-4-11, En Route Fourth Line Data Block Usage, subpara g NOTE.

**NEW****5-4-10. EN ROUTE FOURTH LINE DATA BLOCK USAGE**

No Change

**REFERENCE-**

FAA Order JO 7110.65, Para 5-4-5, Transferring Controller Handoff, subpara b.

FAA Order JO 7110.65, Para 5-4-8, Automated Information Transfer (AIT).

No Change

**REFERENCE-**

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

**1. PARAGRAPH NUMBER AND TITLE:** 5-9-7. SIMULTANEOUS INDEPENDENT APPROACHES – DUAL & TRIPLE

**2. BACKGROUND:** FAA Order JO 7110.65, paragraph 5-9-7 prohibits the use of Fused Display Mode (FUSION) in conjunction with Final Monitor Aid (FMA) displays when conducting final monitoring activities. The results of a recent safety case were assessed by a safety risk management panel (SRMP) which found no hazards with this operation and concluded that the use of FUSION on FMA displays while conducting final monitoring activities does not introduce any additional risk into the NAS.

**3. CHANGE:**

**OLD****5-9-7. SIMULTANEOUS INDEPENDENT APPROACHES – DUAL & TRIPLE****Title through b3 NOTE**

c. FUSION must be discontinued on the FMA displays and set to a single-sensor, when conducting final monitoring activities.

**REFERENCE-**

FAA Order JO 7110.65, Para 5-5-4, minima.

**d through f****NEW****5-9-7. SIMULTANEOUS INDEPENDENT APPROACHES – DUAL & TRIPLE**

No Change

Delete

Delete

Re-letter c through e.



**1. PARAGRAPH NUMBER AND TITLE: 7-4-3. CLEARANCE FOR VISUAL APPROACH**

**2. BACKGROUND:** Air Traffic Procedures (AJV-8) recently provided a clarification regarding successive visual approaches to a non-towered airport. AJV-8 was then made aware of a misunderstanding regarding the application of visual separation during successive visual approaches. When conducting successive visual approaches, the term “follow” is an application of pilot-applied visual separation and controllers must use the guidance contained in paragraph 7-2-1. The basic requirement for visual separation in paragraph 7-2-1 states “Visual separation may be applied when other approved separation is assured before and after the application of visual separation.” It is not possible to ensure approved separation after the application of pilot-applied visual separation at a non-towered airport. Therefore, pilot-applied visual separation to a non-towered airport is not authorized.

**3. CHANGE:****OLD****7-4-3. CLEARANCE FOR VISUAL APPROACH****Title through c1**

**2.** 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**

**3.** The pilot reports the airport or runway in sight but not the preceding aircraft. Radar separation must be maintained until visual separation is provided.

Add

**NEW****7-4-3. CLEARANCE FOR VISUAL APPROACH**

No Change

**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

No Change

**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 7-2-1, Visual Separation****1. PARAGRAPH NUMBER AND TITLE: 9-2-20. WEATHER RECONNAISSANCE FLIGHTS**

**2. BACKGROUND:** In 2016, the National Hurricane Operations Plan (NHOP) Working Group (WG) finalized a Memorandum of Agreement (MOA) between the National Oceanic and Atmospheric Administration (NOAA) Aircraft Operations Center (AOC), U.S. Air Force Reserve Command 53rd Weather Reconnaissance Squadron (WRS), and the Federal Aviation Administration (FAA) in Support of the NHOP. This MOA established procedures for weather reconnaissance/research aircraft operations in a Weather Reconnaissance Area (WRA), which is airspace identified in a WRA Notice to Airmen (NOTAM). To ensure air traffic control (ATC) and pilots are informed about WRAs and weather reconnaissance/research aircraft operations, a series of Document Change Proposals (DCP) are being processed that add WRA information and update weather reconnaissance sections in FAA orders and publications. One DCP, in particular, inserts a copy of the MOA into the appendices of FAA Order JO 7610.4, Special Operations.

**3. CHANGE:****OLD****9-2-20. WEATHER RECONNAISSANCE FLIGHTS****NEW****9-2-20. WEATHER RECONNAISSANCE FLIGHTS**

Title through 9–2–19c

Add

No Change

**d. Aircraft operations associated with a Weather Reconnaissance Area (WRA) must be conducted in accordance with the Memorandum of Agreement between the National Oceanic and Atmospheric Administration Aircraft Operations Center, U.S. Air Force Reserve Command 53<sup>rd</sup> Weather Reconnaissance Squadron, and the Federal Aviation Administration Air Traffic Organization in Support of the National Hurricane Operations Plan (FAA Order JO 7610.4, Appendix 3), and the associated letters of agreement.**

### 1. PARAGRAPH NUMBER AND TITLE: 9–2–23. OPEN SKIES TREATY AIRCRAFT

**2. BACKGROUND:** The Treaty on Open Skies promotes openness and transparency in military activities through reciprocal, unarmed observation flights over the entire national territories of other states' parties. In the implementation of the treaty, the FAA is responsible for developing and implementing the national air traffic control (ATC) rules, procedures, and guidelines to conduct Open Skies Treaty (F and D) flights in United States airspace. The ATC procedures must ensure flight safety, priority handling over regular air traffic, and permit observation flights to transit treaty defined hazardous airspace, prohibited areas, restricted areas, and danger areas. Previous issues with Open Skies Treaty (F and D) priority missions and Special Use Airspace (SUA) management highlight the need to clarify requirements for the facilitation of Open Skies Treaty (F and D) aircraft transiting active SUA/Air Traffic Control Assigned Airspace (ATCAA). The handling of aircraft transiting active SUA/ATCAA is dependent on their status, participating or nonparticipating. Open Skies Treaty (F and D) aircraft have been identified as a nonparticipating aircraft in this change. In accordance with FAA Order JO 7110.65, paragraph 9–3–2, a letter of agreement (LOA) is only required for nonparticipating aircraft to transit active SUA/ATCAA. Nonparticipating aircraft do not require a LOA for transiting deactivated airspace. Additionally, a Department of Defense (DOD) ATC facility with delegated SUA/ATCAA airspace will provide required ATC separation during the Open Skies Treaty (F and D) aircraft transit. Using agencies, without a DOD ATC facility, must deactivate/release SUA/ATCAA airspace to the controlling agency to permit the Open Skies Treaty (F and D) aircraft to transit without delay or impediment. Therefore, FAA Order JO 7110.65, paragraph 9–2–23 is receiving an update with clarification.

### 3. CHANGE:

#### OLD

#### 9–2–23. OPEN SKIES TREATY AIRCRAFT

a. OPEN SKIES aircraft will be identified by the call sign “OSY” (OPEN SKIES) followed by the flight number and a one-letter mission suffix.

#### **EXAMPLE–**

OSY123D

*Mission suffixes:*

\*F = Observation Flights (Priority).

\*D = Demonstration Flights (Priority).

\*T = Transit Flights (Nonpriority).

#### NEW

#### 9–2–23. OPEN SKIES TREATY AIRCRAFT

a. Open Skies aircraft will be identified by the call sign “OSY” (Open Skies) followed by the flight number and a one-letter mission suffix.

#### **EXAMPLE–**

OSY123D

*Mission suffixes:*

\*F = Observation Flights (Priority).

\*D = Demonstration Flights (Priority).

\*T = Transit Flights (Nonpriority).

**NOTE–**

1. Observation/Demonstration flights are conducted and under rigid guidelines outlined in the Treaty of OPEN SKIES that govern sensor usage, maximum flight distances, altitudes, and priorities.

2. Transit flights are for the sole purpose moving an OPEN SKIES aircraft from airport to airport in preparation for an actual OPEN SKIES “F” or “D” mission.

b. Provide priority and special handling to expedite the movement of an OPEN SKIES observation or demonstration flight.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–4, Operational Priority, subpara 1.  
FAA Order JO 7210.3, Para 5–3–7, OPEN SKIES Treaty Aircraft.  
Treaty on OPEN SKIES, Treaty Document, 102–37.

c. OPEN SKIES (F and D) Treaty aircraft, while maintaining compliance with ATC procedures, must have priority over activities in special use airspace (SUA) and must be allowed to transit such airspace as filed after appropriate and timely coordination has been accomplished between the using agency and controlling agency. A letter of agreement is required between the using agency and the controlling agency for Open Skies F and D aircraft to transit active SUA. When Open Skies F and D aircraft transit SUA, an ATC facility must provide approved separation services at all times.

Add

**REFERENCE–**

FAA Order JO 7110.65, Para 9–3–4 Transiting Active SUA/ATCAA

1. F and D Treaty flights transiting SUA will be handled in the following manner:

(a) The ATC facility controlling the F and D Treaty flight must advise the using/scheduling agency or appropriate ATC facility upon initial notification and when the aircraft is 15 minutes from the SUA boundary; and

(1) For SUA that has an ATC facility providing services to the area, provide approved separation. If the ATC facility is unable to provide approved separation from the activities in the SUA, the using agency must confirm that all operations in the SUA have ceased.

Add

**NOTE–**

1. Observation/Demonstration flights are conducted under rigid guidelines outlined in the Treaty on Open Skies that govern sensor usage, maximum flight distances, altitudes, and priorities.

2. Transit flights are for the sole purpose of moving an Open Skies aircraft from airport to airport in preparation for an actual Open Skies “F” or “D” mission.

b. Provide priority and special handling to expedite the movement of an Open Skies observation or demonstration flight.

**REFERENCE–**

FAA Order JO 7110.65, Para 2–1–4, Operational Priority, subpara 1  
FAA Order JO 7210.3, Para 5–3–7, Open Skies Treaty Aircraft.  
Treaty on Open Skies, Treaty Document, 102–37.

c. Open Skies (F and D) Treaty aircraft, while maintaining compliance with ATC procedures, must have priority over activities in special use airspace (SUA)/Air Traffic Control Assigned Airspace (ATCAA). Open Skies (F and D) Treaty aircraft are nonparticipating aircraft and must be allowed to transit SUA/ATCAA as filed after appropriate and timely coordination has been accomplished between the using agency and controlling agency.

**NOTE–**

A letter of agreement is not required for nonparticipating aircraft to transit deactivated/released airspace.

**REFERENCE–**

FAA Order JO 7110.65, Para 9–3–4, Transiting Active SUA/ATCAA

1. Open Skies (F and D) Treaty flights transiting SUA/ATCAA will be handled in the following manner:

(a) The ATC facility controlling the Open Skies (F and D) Treaty flight must advise the using agency, or appropriate ATC facility, upon initial notification and when the aircraft is 30 minutes from the SUA/ATCAA boundary; and

(1) For active SUA/ATCAA with an ATC facility, coordinate and execute the transit of Open Skies (F and D) Treaty aircraft.

**REFERENCE–**

FAA Order JO 7110.65, Para 9–3–4, Transiting Active SUA/ATCAA

(2) For SUA not associated with an ATC facility, the using/scheduling agency must return the SUA to the controlling agency and confirm that all operations in the SUA have ceased.

Add

(b) If the controlling facility/using agency is unable to confirm that all conflicting activities in the SUA have ceased, the OPEN SKIES aircraft must not be permitted access to the SUA.

Add

2. Return SUA to the using agency, if appropriate, within (15) minutes after the F and D Treaty aircraft clears the SUA.

(2) For active SUA/ATCAA without an ATC facility, the using agency must deactivate/release the SUA/ATCAA to permit the Open Skies (F and D) Treaty aircraft to transit as filed in proximity to the active SUA/ATCAA. When deactivating/releasing the SUA/ATCAA for this purpose, the using agency is only required to deactivate/release the portion of the SUA/ATCAA to the controlling agency that is necessary to provide approved separation.

(b) The using agency must deactivate/release the SUA/ATCAA, or portion thereof, no later than 15 minutes prior to the Open Skies (F and D) Treaty aircraft reaching the SUA/ATCAA boundary.

(c) If the controlling agency is unable to confirm with the using agency that all conflicting activities in the SUA/ATCAA have ceased, the Open Skies aircraft must not be permitted access to the SUA/ATCAA.

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

2. Return SUA/ATCAA to the using agency, if requested, within (15) minutes after the Open Skies (F and D) Treaty aircraft clears the SUA/ATCAA.