SUBJ: Air Traffic Control

1. Purpose of This Change. This change transmits revised pages to Federal Aviation Administration Order JO 7110.65T, Air Traffic Control, and the Briefing Guide.

2. Audience. This change applies to all Air Traffic Organization (ATO) personnel and anyone using ATO directives.


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 Retain this transmittal until superseded by a new basic order.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.

Elizabeth Lynn Ray
Vice President, Mission Support Services
Air Traffic Organization

Date: June 21, 2011
Explanation of Changes

Change 3

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

a. 1–1–1. DELIVERY DATES
   4–8–5. SPECIFYING ALTITUDE

This editorial change replaces National Imagery and Mapping Agency (NIMA) with National Geospatial-Intelligence Agency (NGA) in TBL1–1–2 and the NOTE.

b. 2–4–20. AIRCRAFT IDENTIFICATION

This change provides generic guidance concerning approved military services telephony.

c. 3–1–8. LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES

This change identifies the term “wind shear escape” for use by aircrew experiencing a wind shear event and provides a definition of the term in the Pilot/Controller Glossary. This change cancels and incorporates N JO 7110.551, Low Level Wind Shear/Microburst Advisories, effective April 8, 2011.

d. 3–9–4. LINE UP AND WAIT (LUAW)

This editorial change deletes the term “USN NOT APPLICABLE” from paragraph b.

e. 3–11–6. HELICOPTER LANDING CLEARANCE

This editorial change clarifies paragraph b and phraseology.

f. 4–2–10. CANCELLATION OF IFR FLIGHT PLAN

This new paragraph creates phraseology ATC should use to request the cancellation of an IFR flight plan while the pilot is airborne or with (appropriate FSS) after landing.

g. 5–2–II. AIR DEFENSE EXERCISE BEACON CODE ASSIGNMENT

This editorial change corrects reference.

h. 5–5–4. MINIMA

The word “TERMINAL” is deleted.

i. 10–2–19. REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT

This change aligns this directive with international procedures regarding in-flight notification, specifically including those in the ICAO PANS–ATM and Annex 9. These documents specifically call for the pilot—in—command or designee to notify ATC of any suspected communicable disease or other public health risk. This change cancels and incorporates N JO 7110.546, Reporting Death, Illness, or Other Public Health Risk on Board Aircraft, effective February 1, 2011.

j. Additional editorial/format changes were made where necessary, to include recent organization name changes. Revision bars were not used because of the insignificant nature of these changes.
## Page Control Chart

<table>
<thead>
<tr>
<th>REMOVE PAGES</th>
<th>DATED</th>
<th>INSERT PAGES</th>
<th>DATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents i through xix</td>
<td>2/11/10</td>
<td>Table of Contents i through xx</td>
<td>8/25/11</td>
</tr>
<tr>
<td>1–1–1</td>
<td>8/26/10</td>
<td>1–1–1</td>
<td>8/25/11</td>
</tr>
<tr>
<td>1–1–2</td>
<td>3/10/11</td>
<td>1–1–2</td>
<td>3/10/11</td>
</tr>
<tr>
<td>2–4–9</td>
<td>8/26/10</td>
<td>2–4–9</td>
<td>8/26/10</td>
</tr>
<tr>
<td>2–4–10 and 2–4–11</td>
<td>8/26/10</td>
<td>2–4–10 and 2–4–11</td>
<td>8/25/11</td>
</tr>
<tr>
<td>3–1–3 and 3–1–4</td>
<td>8/26/10</td>
<td>3–1–3 and 3–1–4</td>
<td>8/25/11</td>
</tr>
<tr>
<td>3–1–5</td>
<td>2/11/10</td>
<td>3–1–5</td>
<td>8/25/11</td>
</tr>
<tr>
<td>3–1–6</td>
<td>3/10/11</td>
<td>3–1–6 and 3–1–7</td>
<td>8/25/11</td>
</tr>
<tr>
<td>3–9–1</td>
<td>2/11/10</td>
<td>3–9–1</td>
<td>2/11/10</td>
</tr>
<tr>
<td>3–9–2</td>
<td>3/10/11</td>
<td>3–9–2</td>
<td>8/25/11</td>
</tr>
<tr>
<td>3–11–3</td>
<td>2/11/10</td>
<td>3–11–3</td>
<td>2/11/10</td>
</tr>
<tr>
<td>3–11–4</td>
<td>3/10/11</td>
<td>3–11–4</td>
<td>8/25/11</td>
</tr>
<tr>
<td>4–2–3</td>
<td>3/10/11</td>
<td>4–2–3 and 4–2–4</td>
<td>8/25/11</td>
</tr>
<tr>
<td>4–8–5</td>
<td>2/11/10</td>
<td>4–8–5</td>
<td>8/25/11</td>
</tr>
<tr>
<td>4–8–6</td>
<td>2/11/10</td>
<td>4–8–6</td>
<td>2/11/10</td>
</tr>
<tr>
<td>5–2–3</td>
<td>8/26/10</td>
<td>5–2–3</td>
<td>8/26/10</td>
</tr>
<tr>
<td>5–2–4</td>
<td>8/26/10</td>
<td>5–2–4</td>
<td>8/25/11</td>
</tr>
<tr>
<td>5–5–1</td>
<td>2/11/10</td>
<td>5–5–1</td>
<td>2/11/10</td>
</tr>
<tr>
<td>5–5–2</td>
<td>3/10/11</td>
<td>5–5–2</td>
<td>8/25/11</td>
</tr>
<tr>
<td>10–2–7</td>
<td>2/11/10</td>
<td>10–2–7</td>
<td>8/25/11</td>
</tr>
<tr>
<td>PGC–1</td>
<td>3/10/11</td>
<td>PGC–1</td>
<td>8/25/11</td>
</tr>
<tr>
<td>PGC A–7</td>
<td>2/11/10</td>
<td>PGC A–7</td>
<td>2/11/10</td>
</tr>
<tr>
<td>PGC A–8</td>
<td>2/11/10</td>
<td>PGC A–8</td>
<td>8/25/11</td>
</tr>
<tr>
<td>PGC D–3</td>
<td>2/11/10</td>
<td>PGC D–3</td>
<td>2/11/10</td>
</tr>
<tr>
<td>PGC D–4</td>
<td>2/11/10</td>
<td>PGC D–4</td>
<td>8/25/11</td>
</tr>
<tr>
<td>PGC W–1</td>
<td>2/11/10</td>
<td>PGC W–1</td>
<td>8/25/11</td>
</tr>
<tr>
<td>Index I–1 through I–9</td>
<td>3/10/11</td>
<td>Index I–1 through I–9</td>
<td>8/25/11</td>
</tr>
</tbody>
</table>
# Table of Contents

## Chapter 1. General

### Section 1. Introduction

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–1–1. PURPOSE OF THIS ORDER</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–2. AUDIENCE</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–3. WHERE TO FIND THIS ORDER</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–4. WHAT THIS ORDER CANCELS</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–5. EXPLANATION OF CHANGES</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–6. SUBMISSION CUTOFF AND EFFECTIVE DATES</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–7. DELIVERY DATES</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–8. RECOMMENDATIONS FOR PROCEDURAL CHANGES</td>
<td>1–1–1</td>
</tr>
<tr>
<td>1–1–9. PROCEDURAL LETTERS OF AGREEMENT</td>
<td>1–1–2</td>
</tr>
<tr>
<td>1–1–10. CONSTRAINTS GOVERNING SUPPLEMENTS AND PROCEDURAL DEVIATIONS</td>
<td>1–1–2</td>
</tr>
<tr>
<td>1–1–11. SAFETY MANAGEMENT SYSTEM (SMS)</td>
<td>1–1–2</td>
</tr>
<tr>
<td>1–1–12. REFERENCES TO FAA NON–AIR TRAFFIC ORGANIZATIONS</td>
<td>1–1–2</td>
</tr>
<tr>
<td>1–1–13. DISTRIBUTION</td>
<td>1–1–2</td>
</tr>
</tbody>
</table>

### Section 2. Terms of Reference

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–2–1. WORD MEANINGS</td>
<td>1–2–1</td>
</tr>
<tr>
<td>1–2–2. COURSE DEFINITIONS</td>
<td>1–2–2</td>
</tr>
<tr>
<td>1–2–3. NOTES</td>
<td>1–2–2</td>
</tr>
<tr>
<td>1–2–4. REFERENCES</td>
<td>1–2–3</td>
</tr>
<tr>
<td>1–2–5. ANNOTATIONS</td>
<td>1–2–3</td>
</tr>
<tr>
<td>1–2–6. ABBREVIATIONS</td>
<td>1–2–3</td>
</tr>
</tbody>
</table>

## Chapter 2. General Control

### Section 1. General

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–1–1. ATC SERVICE</td>
<td>2–1–1</td>
</tr>
<tr>
<td>2–1–2. DUTY PRIORITY</td>
<td>2–1–1</td>
</tr>
<tr>
<td>2–1–3. PROCEDURAL PREFERENCE</td>
<td>2–1–1</td>
</tr>
<tr>
<td>2–1–4. OPERATIONAL PRIORITY</td>
<td>2–1–2</td>
</tr>
<tr>
<td>2–1–5. EXPEDITIOUS COMPLIANCE</td>
<td>2–1–3</td>
</tr>
<tr>
<td>2–1–6. SAFETY ALERT</td>
<td>2–1–3</td>
</tr>
<tr>
<td>2–1–7. INFLIGHT EQUIPMENT MALFUNCTIONS</td>
<td>2–1–4</td>
</tr>
<tr>
<td>2–1–8. MINIMUM FUEL</td>
<td>2–1–4</td>
</tr>
<tr>
<td>2–1–9. REPORTING ESSENTIAL FLIGHT INFORMATION</td>
<td>2–1–4</td>
</tr>
<tr>
<td>2–1–10. NAV/AID MALFUNCTIONS</td>
<td>2–1–5</td>
</tr>
<tr>
<td>2–1–11. USE OF MARSA</td>
<td>2–1–5</td>
</tr>
<tr>
<td>2–1–12. MILITARY PROCEDURES</td>
<td>2–1–6</td>
</tr>
<tr>
<td>2–1–13. FORMATION FLIGHTS</td>
<td>2–1–6</td>
</tr>
<tr>
<td>2–1–14. COORDINATE USE OF AIRSPACE</td>
<td>2–1–7</td>
</tr>
<tr>
<td>2–1–15. CONTROL TRANSFER</td>
<td>2–1–7</td>
</tr>
<tr>
<td>2–1–16. SURFACE AREAS</td>
<td>2–1–7</td>
</tr>
</tbody>
</table>
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
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
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. HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS) ...... 2-6-1
2-6-3. PIREP INFORMATION ....................................................... 2-6-1
2-6-4. WEATHER AND CHAFF SERVICES ........................................ 2-6-2
2-6-5. CALM WIND CONDITIONS .................................................. 2-6-2
2-6-6. REPORTING WEATHER CONDITIONS .................................... 2-6-4
2-6-7. DISSEMINATING WEATHER INFORMATION .................................. 2-6-4

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 SECTOR TEAM POSITION RESPONSIBILITIES ............. 2-10-1
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 ON RUNWAYS .......................... 3–1–2
3–1–6. TRAFFIC INFORMATION .......................... 3–1–2
3–1–7. POSITION DETERMINATION .......................... 3–1–2
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 .......................... 3–1–5
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–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 .......................... 3–3–1
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 .......................... 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
Table of Contents

Paragraph                                Page
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   3-4-4
3-4-15. SIMULTANEOUS APPROACH AND RUNWAY EDGE LIGHT OPERATION 3-4-4
3-4-16. HIGH SPEED TURNOFF LIGHTS        3-4-5
3-4-17. TAXIWAY LIGHTS                  3-4-5
3-4-18. OBSTRUCTION LIGHTS              3-4-5
3-4-19. ROTATING BEACON                 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 3-7-1
3-7-3. GROUND OPERATIONS                3-7-4
3-7-4. RUNWAY PROXIMITY                3-7-4
3-7-5. PRECISION APPROACH CRITICAL AREA 3-7-4
3-7-6. PRECISION OBSTACLE FREE ZONE (POFZ) AND FINAL APPROACH OBSTACLE CLEARANCE SURFACES (OCS) 3-7-5

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 3-9-6
3-9-8. INTERSECTING RUNWAY SEPARATION   3-9-7
3-9-9. TAKEOFF CLEARANCE               3-9-9
3-9-10. CANCELLATION OF TAKEOFF CLEARANCE 3-9-10

Section 10. Arrival Procedures and Separation
3-10-1. LANDING INFORMATION             3-10-1
**Table of Contents**

**Paragraph**  
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 SEPARATION ........................................ 3–10–3  
3–10–5. LANDING CLEARANCE ................................................................. 3–10–6  
3–10–6. ANTICIPATING SEPARATION ....................................................... 3–10–7  
3–10–8. WITHHOLDING LANDING CLEARANCE ......................................... 3–10–7  
3–10–10. ALTITUDE RESTRICTED LOW APPROACH ................................... 3–10–8  
3–10–11. CLOSED TRAFFIC ....................................................................... 3–10–8  
3–10–12. OVERHEAD MANEUVER ............................................................. 3–10–8  
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 .................................................................................. 4–1–2  
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 .............................................................. 4–2–2  
4–2–7. ALTRV CLEARANCE ..................................................................... 4–2–2  
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 ...................................... 4–2–3
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        4–3–3
4–3–4. DEPARTURE RESTRICTIONS, CLEARANCE VOID TIMES, HOLD FOR RELEASE, AND RELEASE TIMES 4–3–5
4–3–5. GROUND STOP                             4–3–6
4–3–6. DELAY SEQUENCING                        4–3–6
4–3–7. FORWARD DEPARTURE DELAY INFORMATION     4–3–6
4–3–8. COORDINATION WITH RECEIVING FACILITY   4–3–6
4–3–9. VFR RELEASE OF IFR DEPARTURE           4–3–7
4–3–10. FORWARDING DEPARTURE TIMES            4–3–7

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  4–4–2
4–4–4. ALTERNATIVE ROUTES                      4–4–3
4–4–5. CLASS G AIRSPACE                        4–4–3
4–4–6. DIRECT CLEARANCES                       4–4–3

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              4–5–2
4–5–7. ALTITUDE INFORMATION                    4–5–3
4–5–8. ANTICIPATED ALTITUDE CHANGES            4–5–6

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 NAVALDs                     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
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4–7–6. ARRIVAL INFORMATION</td>
<td>4–7–3</td>
</tr>
<tr>
<td>4–7–7. WEATHER INFORMATION</td>
<td>4–7–3</td>
</tr>
<tr>
<td>4–7–8. BELOW MINIMA REPORT BY PILOT</td>
<td>4–7–4</td>
</tr>
<tr>
<td>4–7–9. TRANSFER OF JURISDICTION</td>
<td>4–7–4</td>
</tr>
<tr>
<td>4–7–10. APPROACH INFORMATION</td>
<td>4–7–4</td>
</tr>
<tr>
<td>4–7–11. ARRIVAL INFORMATION BY APPROACH CONTROL FACILITIES</td>
<td>4–7–5</td>
</tr>
<tr>
<td>4–7–12. AIRPORT CONDITIONS</td>
<td>4–7–5</td>
</tr>
<tr>
<td>4–7–13. SWITCHING ILS/MLS RUNWAYS</td>
<td>4–7–6</td>
</tr>
</tbody>
</table>

**Section 8. Approach Clearance Procedures**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4–8–1. APPROACH CLEARANCE</td>
<td>4–8–1</td>
</tr>
<tr>
<td>4–8–2. CLEARANCE LIMIT</td>
<td>4–8–1</td>
</tr>
<tr>
<td>4–8–3. RELAYED APPROACH CLEARANCE</td>
<td>4–8–5</td>
</tr>
<tr>
<td>4–8–4. ALTITUDE ASSIGNMENT FOR MILITARY HIGH ALTITUDE INSTRUMENT</td>
<td>4–8–5</td>
</tr>
<tr>
<td>APPROACHES</td>
<td></td>
</tr>
<tr>
<td>4–8–5. SPECIFYING Altitude</td>
<td>4–8–5</td>
</tr>
<tr>
<td>4–8–6. CIRCLING APPROACH</td>
<td>4–8–5</td>
</tr>
<tr>
<td>4–8–7. SIDE–STEP MANEUVER</td>
<td>4–8–6</td>
</tr>
<tr>
<td>4–8–8. COMMUNICATIONS RELEASE</td>
<td>4–8–6</td>
</tr>
<tr>
<td>4–8–9. MISSED APPROACH</td>
<td>4–8–6</td>
</tr>
<tr>
<td>4–8–10. APPROACH INFORMATION</td>
<td>4–8–6</td>
</tr>
<tr>
<td>4–8–11. PRACTICE APPROACHES</td>
<td>4–8–6</td>
</tr>
<tr>
<td>4–8–12. LOW APPROACH AND TOUCH-AND-GO</td>
<td>4–8–7</td>
</tr>
</tbody>
</table>

**Chapter 5. Radar**

**Section 1. General**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–1–1. PRESENTATION AND EQUIPMENT PERFORMANCE</td>
<td>5–1–1</td>
</tr>
<tr>
<td>5–1–2. ALIGNMENT ACCURACY CHECK</td>
<td>5–1–1</td>
</tr>
<tr>
<td>5–1–3. RADAR USE</td>
<td>5–1–1</td>
</tr>
<tr>
<td>5–1–4. BEACON RANGE ACCURACY</td>
<td>5–1–2</td>
</tr>
<tr>
<td>5–1–5. ELECTRONIC ATTACK (EA) ACTIVITY</td>
<td>5–1–2</td>
</tr>
<tr>
<td>5–1–6. SERVICE LIMITATIONS</td>
<td>5–1–3</td>
</tr>
<tr>
<td>5–1–7. ELECTRONIC CURSOR</td>
<td>5–1–3</td>
</tr>
<tr>
<td>5–1–8. MERGING TARGET PROCEDURES</td>
<td>5–1–3</td>
</tr>
<tr>
<td>5–1–9. HOLDING PATTERN SURVEILLANCE</td>
<td>5–1–4</td>
</tr>
<tr>
<td>5–1–10. DEVIATION ADVISORIES</td>
<td>5–1–4</td>
</tr>
<tr>
<td>5–1–11. RADAR FIX POSTING</td>
<td>5–1–4</td>
</tr>
<tr>
<td>5–1–12. POSITION REPORTING</td>
<td>5–1–4</td>
</tr>
<tr>
<td>5–1–13. RADAR SERVICE TERMINATION</td>
<td>5–1–4</td>
</tr>
</tbody>
</table>

**Section 2. Beacon Systems**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–2–1. ASSIGNMENT CRITERIA</td>
<td>5–2–1</td>
</tr>
<tr>
<td>5–2–2. DISCRETE ENVIRONMENT</td>
<td>5–2–1</td>
</tr>
<tr>
<td>5–2–3. NONDISCRETE ENVIRONMENT</td>
<td>5–2–1</td>
</tr>
<tr>
<td>5–2–4. MIXED ENVIRONMENT</td>
<td>5–2–1</td>
</tr>
<tr>
<td>5–2–5. RADAR BEACON CODE CHANGES</td>
<td>5–2–2</td>
</tr>
<tr>
<td>5–2–6. FUNCTION CODE ASSIGNMENTS</td>
<td>5–2–2</td>
</tr>
<tr>
<td>5–2–7. EMERGENCY CODE ASSIGNMENT</td>
<td>5–2–3</td>
</tr>
</tbody>
</table>

**Table of Contents**

viii
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. INTERFACILITY AUTOMATED INFORMATION TRANSFER ......... 5–4–5
5–4–10. PREARRANGED COORDINATION ............................. 5–4–5
5–4–11. 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
5–5–3. TARGET RESOLUTION .................................................. 5–5–1
5–5–4. MINIMA ................................................................. 5–5–2
5–5–5. VERTICAL APPLICATION .............................................. 5–5–3

Table of Contents
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–5–6. EXCEPTIONS</td>
<td>5–5–4</td>
</tr>
<tr>
<td>5–5–7. PASSING OR DIVERGING</td>
<td>5–5–4</td>
</tr>
<tr>
<td>5–5–8. ADDITIONAL SEPARATION FOR FORMATION FLIGHTS</td>
<td>5–5–4</td>
</tr>
<tr>
<td>5–5–9. SEPARATION FROM OBSTRUCTIONS</td>
<td>5–5–5</td>
</tr>
<tr>
<td>5–5–10. ADJACENT AIRSPACE</td>
<td>5–5–5</td>
</tr>
<tr>
<td>5–5–11. EDGE OF SCOPE</td>
<td>5–5–5</td>
</tr>
<tr>
<td>5–5–12. BEACON TARGET DISPLACEMENT</td>
<td>5–5–6</td>
</tr>
<tr>
<td>5–5–13. GPA 102/103 CORRECTION FACTOR</td>
<td>5–5–6</td>
</tr>
</tbody>
</table>

**Section 6. Vectoring**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–6–1. APPLICATION</td>
<td>5–6–1</td>
</tr>
<tr>
<td>5–6–2. METHODS</td>
<td>5–6–1</td>
</tr>
<tr>
<td>5–6–3. VECTORS BELOW MINIMUM ALTITUDE</td>
<td>5–6–2</td>
</tr>
</tbody>
</table>

**Section 7. Speed Adjustment**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–7–1. APPLICATION</td>
<td>5–7–1</td>
</tr>
<tr>
<td>5–7–2. METHODS</td>
<td>5–7–2</td>
</tr>
<tr>
<td>5–7–3. MINIMA</td>
<td>5–7–3</td>
</tr>
<tr>
<td>5–7–4. TERMINATION</td>
<td>5–7–3</td>
</tr>
</tbody>
</table>

**Section 8. Radar Departures**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–8–1. PROCEDURES</td>
<td>5–8–1</td>
</tr>
<tr>
<td>5–8–2. INITIAL HEADING</td>
<td>5–8–1</td>
</tr>
<tr>
<td>5–8–3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES</td>
<td>5–8–1</td>
</tr>
<tr>
<td>5–8–4. DEPARTURE AND ARRIVAL</td>
<td>5–8–3</td>
</tr>
<tr>
<td>5–8–5. DEPARTURES AND ARRIVALS ON PARALLEL OR NONINTERSECTING DIVERGING RUNWAYS</td>
<td>5–8–3</td>
</tr>
</tbody>
</table>

**Section 9. Radar Arrivals**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–9–1. VECTORS TO FINAL APPROACH COURSE</td>
<td>5–9–1</td>
</tr>
<tr>
<td>5–9–2. FINAL APPROACH COURSE INTERCEPTION</td>
<td>5–9–1</td>
</tr>
<tr>
<td>5–9–3. VECTORS ACROSS FINAL APPROACH COURSE</td>
<td>5–9–2</td>
</tr>
<tr>
<td>5–9–4. ARRIVAL INSTRUCTIONS</td>
<td>5–9–2</td>
</tr>
<tr>
<td>5–9–5. APPROACH SEPARATION RESPONSIBILITY</td>
<td>5–9–5</td>
</tr>
<tr>
<td>5–9–6. PARALLEL DEPENDENT ILS/MLS APPROACHES</td>
<td>5–9–7</td>
</tr>
<tr>
<td>5–9–7. SIMULTANEOUS INDEPENDENT ILS/MLS APPROACHES– DUAL &amp; TRIPLE</td>
<td>5–9–8</td>
</tr>
<tr>
<td>5–9–8. SIMULTANEOUS INDEPENDENT DUAL ILS/MLS APPROACHES– HIGH UPDATE RADAR</td>
<td>5–9–9</td>
</tr>
<tr>
<td>5–9–9. SIMULTANEOUS OFFSET INSTRUMENT APPROACHES (SOIA)– HIGH UPDATE RADAR</td>
<td>5–9–11</td>
</tr>
</tbody>
</table>

**Section 10. Radar Approaches– Terminal**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–10–1. APPLICATION</td>
<td>5–10–1</td>
</tr>
<tr>
<td>5–10–2. APPROACH INFORMATION</td>
<td>5–10–1</td>
</tr>
<tr>
<td>5–10–3. NO-GYRO APPROACH</td>
<td>5–10–2</td>
</tr>
<tr>
<td>5–10–4. LOST COMMUNICATIONS</td>
<td>5–10–2</td>
</tr>
<tr>
<td>5–10–5. RADAR CONTACT LOST</td>
<td>5–10–3</td>
</tr>
<tr>
<td>5–10–6. LANDING CHECK</td>
<td>5–10–3</td>
</tr>
<tr>
<td>5–10–7. POSITION INFORMATION</td>
<td>5–10–3</td>
</tr>
</tbody>
</table>
Para 5–10–8. FINAL CONTROLLER CHANGEOVER .......................... 5–10–3
Para 5–10–9. COMMUNICATIONS CHECK ........................................ 5–10–4
Para 5–10–10. TRANSMISSION ACKNOWLEDGMENT ......................... 5–10–4
Para 5–10–11. MISSED APPROACH ................................................... 5–10–4
Para 5–10–12. LOW APPROACH AND TOUCH-AND-GO ...................... 5–10–4
Para 5–10–13. TOWER CLEARANCE ................................................. 5–10–4
Para 5–10–14. FINAL APPROACH ABNORMALITIES .......................... 5–10–5
Para 5–10–15. MILITARY SINGLE FREQUENCY APPROACHES ................ 5–10–5

Section 11. Surveillance Approaches—Terminal

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

Section 12. PAR Approaches—Terminal

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

Section 13. Use of PAR for Approach Monitoring—Terminal

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

Section 14. Automation—En Route

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

Section 15. Automated Radar Terminal Systems (ARTS)—Terminal

Para 5–15–1. APPLICATION ......................................................... 5–15–1
Para 5–15–2. RESPONSIBILITY ....................................................... 5–15–1
Para 5–15–3. FUNCTIONAL USE ..................................................... 5–15–1

Table of Contents  xi
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–15–4. SYSTEM REQUIREMENTS</td>
<td>5–15–1</td>
</tr>
<tr>
<td>5–15–5. INFORMATION DISPLAYED</td>
<td>5–15–1</td>
</tr>
<tr>
<td>5–15–6. CA/MCI</td>
<td>5–15–2</td>
</tr>
<tr>
<td>5–15–7. INHIBITING MINIMUM SAFE ALTITUDE WARNING (MSAW)</td>
<td>5–15–2</td>
</tr>
<tr>
<td>5–15–8. TRACK SUSPEND FUNCTION</td>
<td>5–15–2</td>
</tr>
</tbody>
</table>

Section 16. TPX–42– Terminal

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–16–1. APPLICATION</td>
<td>5–16–1</td>
</tr>
<tr>
<td>5–16–2. RESPONSIBILITY</td>
<td>5–16–1</td>
</tr>
<tr>
<td>5–16–3. FUNCTIONAL USE</td>
<td>5–16–1</td>
</tr>
<tr>
<td>5–16–4. SYSTEM REQUIREMENTS</td>
<td>5–16–1</td>
</tr>
<tr>
<td>5–16–5. INFORMATION DISPLAYED</td>
<td>5–16–1</td>
</tr>
<tr>
<td>5–16–6. INHIBITING LOW ALTITUDE ALERT SYSTEM (LAAS)</td>
<td>5–16–1</td>
</tr>
</tbody>
</table>

Chapter 6. Nonradar

Section 1. General

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–1–1. DISTANCE</td>
<td>6–1–1</td>
</tr>
<tr>
<td>6–1–2. NONRECEIPT OF POSITION REPORT</td>
<td>6–1–1</td>
</tr>
<tr>
<td>6–1–3. DUPLICATE POSITION REPORT</td>
<td>6–1–1</td>
</tr>
<tr>
<td>6–1–4. ADJACENT AIRPORT OPERATION</td>
<td>6–1–1</td>
</tr>
<tr>
<td>6–1–5. ARRIVAL MINIMA</td>
<td>6–1–1</td>
</tr>
</tbody>
</table>

Section 2. Initial Separation of Successive Departing Aircraft

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–2–1. MINIMA ON DIVERGING COURSES</td>
<td>6–2–1</td>
</tr>
<tr>
<td>6–2–2. MINIMA ON SAME COURSE</td>
<td>6–2–3</td>
</tr>
</tbody>
</table>

Section 3. Initial Separation of Departing and Arriving Aircraft

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–3–1. SEPARATION MINIMA</td>
<td>6–3–1</td>
</tr>
</tbody>
</table>

Section 4. Longitudinal Separation

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–4–1. APPLICATION</td>
<td>6–4–1</td>
</tr>
<tr>
<td>6–4–2. MINIMA ON SAME, CONVERGING, OR CROSSING COURSES</td>
<td>6–4–1</td>
</tr>
<tr>
<td>6–4–3. MINIMA ON OPPOSITE COURSES</td>
<td>6–4–5</td>
</tr>
<tr>
<td>6–4–4. SEPARATION BY PILOTS</td>
<td>6–4–6</td>
</tr>
<tr>
<td>6–4–5. RNAV AIRCRAFT ALONG VOR AIRWAYS/ ROUTES</td>
<td>6–4–6</td>
</tr>
</tbody>
</table>

Section 5. Lateral Separation

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–5–1. SEPARATION METHODS</td>
<td>6–5–1</td>
</tr>
<tr>
<td>6–5–2. MINIMA ON DIVERGING RADIALS</td>
<td>6–5–1</td>
</tr>
<tr>
<td>6–5–3. DME ARC MINIMA</td>
<td>6–5–2</td>
</tr>
<tr>
<td>6–5–4. MINIMA ALONG OTHER THAN ESTABLISHED AIRWAYS OR ROUTES</td>
<td>6–5–2</td>
</tr>
<tr>
<td>6–5–5. RNAV MINIMA– DIVERING/CROSSING COURSES</td>
<td>6–5–4</td>
</tr>
</tbody>
</table>

Section 6. Vertical Separation

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–6–1. APPLICATION</td>
<td>6–6–1</td>
</tr>
<tr>
<td>6–6–2. EXCEPTIONS</td>
<td>6–6–1</td>
</tr>
<tr>
<td>6–6–3. SEPARATION BY PILOTS</td>
<td>6–6–1</td>
</tr>
</tbody>
</table>
Section 7. Timed Approaches

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6–7–1. APPLICATION</td>
<td>6–7–1</td>
</tr>
<tr>
<td>6–7–2. APPROACH SEQUENCE</td>
<td>6–7–1</td>
</tr>
<tr>
<td>6–7–3. SEQUENCE INTERRUPTION</td>
<td>6–7–2</td>
</tr>
<tr>
<td>6–7–4. LEVEL FLIGHT RESTRICTION</td>
<td>6–7–2</td>
</tr>
<tr>
<td>6–7–5. INTERVAL MINIMA</td>
<td>6–7–2</td>
</tr>
<tr>
<td>6–7–6. TIME CHECK</td>
<td>6–7–2</td>
</tr>
<tr>
<td>6–7–7. MISSED APPROACHES</td>
<td>6–7–2</td>
</tr>
</tbody>
</table>

Chapter 7. Visual

Section 1. General

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–1–1. CLASS A AIRSPACE RESTRICTIONS</td>
<td>7–1–1</td>
</tr>
<tr>
<td>7–1–2. VFR CONDITIONS</td>
<td>7–1–1</td>
</tr>
<tr>
<td>7–1–3. APPROACH CONTROL SERVICE FOR VFR ARRIVING AIRCRAFT</td>
<td>7–1–1</td>
</tr>
<tr>
<td>7–1–4. VISUAL HOLDING OF VFR AIRCRAFT</td>
<td>7–1–1</td>
</tr>
</tbody>
</table>

Section 2. Visual Separation

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–2–1. VISUAL SEPARATION</td>
<td>7–2–1</td>
</tr>
</tbody>
</table>

Section 3. VFR-on-top

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–3–1. VFR-ON-TOP</td>
<td>7–3–1</td>
</tr>
<tr>
<td>7–3–2. ALTITUDE FOR DIRECTION OF FLIGHT</td>
<td>7–3–2</td>
</tr>
</tbody>
</table>

Section 4. Approaches

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–4–1. VISUAL APPROACH</td>
<td>7–4–1</td>
</tr>
<tr>
<td>7–4–2. VECTORS FOR VISUAL APPROACH</td>
<td>7–4–1</td>
</tr>
<tr>
<td>7–4–3. CLEARANCE FOR VISUAL APPROACH</td>
<td>7–4–1</td>
</tr>
<tr>
<td>7–4–4. APPROACHES TO MULTIPLE RUNWAYS</td>
<td>7–4–2</td>
</tr>
<tr>
<td>7–4–5. CHARTED VISUAL FLIGHT PROCEDURES (CVFP). USA/USN NOT APPLICABLE</td>
<td>7–4–3</td>
</tr>
<tr>
<td>7–4–6. CONTACT APPROACH</td>
<td>7–4–3</td>
</tr>
</tbody>
</table>

Section 5. Special VFR (SVFR)

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–5–1. AUTHORIZATION</td>
<td>7–5–1</td>
</tr>
<tr>
<td>7–5–2. PRIORITY</td>
<td>7–5–1</td>
</tr>
<tr>
<td>7–5–3. SEPARATION</td>
<td>7–5–2</td>
</tr>
<tr>
<td>7–5–4. ALTITUDE ASSIGNMENT</td>
<td>7–5–2</td>
</tr>
<tr>
<td>7–5–5. LOCAL OPERATIONS</td>
<td>7–5–2</td>
</tr>
<tr>
<td>7–5–6. CLIMB TO VFR</td>
<td>7–5–3</td>
</tr>
<tr>
<td>7–5–7. GROUND VISIBILITY BELOW ONE MILE</td>
<td>7–5–3</td>
</tr>
<tr>
<td>7–5–8. FLIGHT VISIBILITY BELOW ONE MILE</td>
<td>7–5–3</td>
</tr>
</tbody>
</table>

Section 6. Basic Radar Service to VFR Aircraft– Terminal

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7–6–1. APPLICATION</td>
<td>7–6–1</td>
</tr>
<tr>
<td>7–6–2. SERVICE AVAILABILITY</td>
<td>7–6–1</td>
</tr>
<tr>
<td>7–6–3. INITIAL CONTACT</td>
<td>7–6–1</td>
</tr>
<tr>
<td>7–6–4. IDENTIFICATION</td>
<td>7–6–1</td>
</tr>
</tbody>
</table>
Paragraph | Page
--- | ---
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
8–1–6. RECEIPT OF POSITION REPORTS | 8–1–1
8–1–7. OCEANIC NAVIGATIONAL ERROR REPORTING (ONER) PROCEDURES | 8–1–1
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>8–1–8. USE OF CONTROL ESTIMATES</td>
<td>8–1–1</td>
</tr>
<tr>
<td><strong>Section 2. Coordination</strong></td>
<td></td>
</tr>
<tr>
<td>8–2–1. GENERAL</td>
<td>8–2–1</td>
</tr>
<tr>
<td>8–2–2. TRANSFER OF CONTROL AND COMMUNICATIONS</td>
<td>8–2–1</td>
</tr>
<tr>
<td>8–2–3. AIR TRAFFIC SERVICES INTERFACILITY DATA COMMUNICATIONS (AIDC)</td>
<td>8–2–1</td>
</tr>
<tr>
<td><strong>Section 3. Longitudinal Separation</strong></td>
<td></td>
</tr>
<tr>
<td>8–3–1. APPLICATION</td>
<td>8–3–1</td>
</tr>
<tr>
<td>8–3–2. SEPARATION METHODS</td>
<td>8–3–1</td>
</tr>
<tr>
<td>8–3–3. MACH NUMBER TECHNIQUE</td>
<td>8–3–2</td>
</tr>
<tr>
<td><strong>Section 4. Lateral Separation</strong></td>
<td></td>
</tr>
<tr>
<td>8–4–1. APPLICATION</td>
<td>8–4–1</td>
</tr>
<tr>
<td>8–4–2. SEPARATION METHODS</td>
<td>8–4–1</td>
</tr>
<tr>
<td>8–4–3. REDUCTION OF ROUTE PROTECTED AIRSPACE</td>
<td>8–4–3</td>
</tr>
<tr>
<td>8–4–4. TRACK SEPARATION</td>
<td>8–4–4</td>
</tr>
<tr>
<td><strong>Section 5. Offshore/Oceanic Transition Procedures</strong></td>
<td></td>
</tr>
<tr>
<td>8–5–1. ALTITUDE/FLIGHT LEVEL TRANSITION</td>
<td>8–5–1</td>
</tr>
<tr>
<td>8–5–2. COURSE DIVERGENCE</td>
<td>8–5–1</td>
</tr>
<tr>
<td>8–5–3. OPPOSITE DIRECTION</td>
<td>8–5–1</td>
</tr>
<tr>
<td>8–5–4. SAME DIRECTION</td>
<td>8–5–2</td>
</tr>
<tr>
<td><strong>Section 6. Separation from Airspace Reservations</strong></td>
<td></td>
</tr>
<tr>
<td>8–6–1. TEMPORARY STATIONARY AIRSPACE RESERVATIONS</td>
<td>8–6–1</td>
</tr>
<tr>
<td>8–6–2. REFUSAL OF AVOIDANCE CLEARANCE</td>
<td>8–6–1</td>
</tr>
<tr>
<td>8–6–3. TEMPORARY MOVING AIRSPACE RESERVATIONS</td>
<td>8–6–1</td>
</tr>
<tr>
<td><strong>Section 7. North Atlantic ICAO Region</strong></td>
<td></td>
</tr>
<tr>
<td>8–7–1. APPLICATION</td>
<td>8–7–1</td>
</tr>
<tr>
<td>8–7–2. VERTICAL SEPARATION</td>
<td>8–7–1</td>
</tr>
<tr>
<td>8–7–3. LONGITUDINAL SEPARATION</td>
<td>8–7–1</td>
</tr>
<tr>
<td>8–7–4. LATERAL SEPARATION</td>
<td>8–7–2</td>
</tr>
<tr>
<td>8–7–5. PROCEDURES FOR WEATHER DEVIATIONS IN NORTH ATLANTIC (NAT) AIRSPACE</td>
<td>8–7–2</td>
</tr>
<tr>
<td><strong>Section 8. Caribbean ICAO Region</strong></td>
<td></td>
</tr>
<tr>
<td>8–8–1. APPLICATION</td>
<td>8–8–1</td>
</tr>
<tr>
<td>8–8–2. VERTICAL SEPARATION</td>
<td>8–8–1</td>
</tr>
<tr>
<td>8–8–3. LONGITUDINAL SEPARATION</td>
<td>8–8–1</td>
</tr>
<tr>
<td>8–8–4. LATERAL SEPARATION</td>
<td>8–8–2</td>
</tr>
<tr>
<td>8–8–5. VFR CLIMB AND DESCENT</td>
<td>8–8–2</td>
</tr>
<tr>
<td><strong>Section 9. Pacific ICAO Region</strong></td>
<td></td>
</tr>
<tr>
<td>8–9–1. APPLICATION</td>
<td>8–9–1</td>
</tr>
<tr>
<td>8–9–2. VERTICAL SEPARATION</td>
<td>8–9–1</td>
</tr>
<tr>
<td>8–9–3. LONGITUDINAL SEPARATION</td>
<td>8–9–1</td>
</tr>
</tbody>
</table>
## Section 10. North American ICAO Region—Arctic CTA

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 .............................................. 8–10–1

### 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 .................................... 9–2–2
9–2–9. SPECIAL INTEREST SITES ....................................... 9–2–4
9–2–10. WASHINGTON, DC, SPECIAL FLIGHT RULES AREA (DC SFRA)/ATC SECURITY SERVICES .............................. 9–2–4
9–2–11. SECURITY NOTICE (SECNOT) ................................. 9–2–5
9–2–12. LAW ENFORCEMENT OPERATIONS BY CIVIL AND MILITARY ORGANIZATIONS ........................................ 9–2–5
9–2–13. MILITARY AERIAL REFUELING ............................... 9–2–6
9–2–14. MILITARY OPERATIONS ABOVE FL 600 .................. 9–2–7
9–2–15. MILITARY SPECIAL USE FREQUENCIES ............... 9–2–8
9–2–16. AVOIDANCE OF AREAS OF NUCLEAR RADIATION ...... 9–2–8
9–2–17. SAMP ................................................................... 9–2–8
9–2–18. AWACS/NORAD SPECIAL FLIGHTS ...................... 9–2–9
9–2–19. WEATHER RECONNAISSANCE FLIGHTS .................. 9–2–9
9–2–20. EVASIVE ACTION MANEUVER ................................ 9–2–9
9–2–21. NONSTANDARD FORMATION/CELL OPERATIONS 9–2–10
9–2–22. OPEN SKIES TREATY AIRCRAFT ............................ 9–2–10

#### Section 3. Special Use and ATC Assigned Airspace

9–3–1. APPLICATION ............................................................... 9–3–1
9–3–2. SEPARATION MINIMA ................................................ 9–3–1
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
10–2–9. RADAR ASSISTANCE TECHNIQUES .............................. 10–2–3
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–2–10. EMERGENCY LOCATOR TRANSMITTER (ELT) SIGNALS</td>
<td>10–2–3</td>
</tr>
<tr>
<td>10–2–11. AIRCRAFT BOMB THREATS</td>
<td>10–2–4</td>
</tr>
<tr>
<td>10–2–12. EXPLOSIVE DETECTION K–9 TEAMS</td>
<td>10–2–5</td>
</tr>
<tr>
<td>10–2–13. MANPADS ALERT</td>
<td>10–2–5</td>
</tr>
<tr>
<td>10–2–14. UNAUTHORIZED LASER ILLUMINATION OF AIRCRAFT</td>
<td>10–2–6</td>
</tr>
<tr>
<td>10–2–15. EMERGENCY AIRPORT RECOMMENDATION</td>
<td>10–2–6</td>
</tr>
<tr>
<td>10–2–16. GUIDANCE TO EMERGENCY AIRPORT</td>
<td>10–2–6</td>
</tr>
<tr>
<td>10–2–17. EMERGENCY OBSTRUCTION VIDEO MAP (EOVM)</td>
<td>10–2–6</td>
</tr>
<tr>
<td>10–2–18. VOLCANIC ASH</td>
<td>10–2–7</td>
</tr>
<tr>
<td>10–2–19. REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT</td>
<td>10–2–7</td>
</tr>
</tbody>
</table>

**Section 3. Overdue Aircraft**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–3–1. OVERDUE AIRCRAFT</td>
<td>10–3–1</td>
</tr>
<tr>
<td>10–3–2. INFORMATION TO BE FORWARDED TO ARTCC</td>
<td>10–3–1</td>
</tr>
<tr>
<td>10–3–3. INFORMATION TO BE FORWARDED TO RCC</td>
<td>10–3–1</td>
</tr>
<tr>
<td>10–3–4. ALNOT</td>
<td>10–3–2</td>
</tr>
<tr>
<td>10–3–5. RESPONSIBILITY TRANSFER TO RCC</td>
<td>10–3–2</td>
</tr>
<tr>
<td>10–3–6. AIRCRAFT POSITION PLOTS</td>
<td>10–3–2</td>
</tr>
<tr>
<td>10–3–7. ALNOT CANCELLATION</td>
<td>10–3–2</td>
</tr>
</tbody>
</table>

**Section 4. Control Actions**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–4–1. TRAFFIC RESTRICTIONS</td>
<td>10–4–1</td>
</tr>
<tr>
<td>10–4–2. LIGHTING REQUIREMENTS</td>
<td>10–4–1</td>
</tr>
<tr>
<td>10–4–3. TRAFFIC RESUMPTION</td>
<td>10–4–1</td>
</tr>
<tr>
<td>10–4–4. COMMUNICATIONS FAILURE</td>
<td>10–4–1</td>
</tr>
</tbody>
</table>

**Section 5. Miscellaneous Operations**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–5–1. NAVY FLEET SUPPORT MISSIONS</td>
<td>10–5–1</td>
</tr>
<tr>
<td>10–5–2. EXPLOSIVE CARGO</td>
<td>10–5–1</td>
</tr>
</tbody>
</table>

**Section 6. Oceanic Emergency Procedures**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–6–1. APPLICATION</td>
<td>10–6–1</td>
</tr>
<tr>
<td>10–6–2. PHASES OF EMERGENCY</td>
<td>10–6–1</td>
</tr>
<tr>
<td>10–6–3. ALERTING SERVICE AND SPECIAL ASSISTANCE</td>
<td>10–6–1</td>
</tr>
<tr>
<td>10–6–4. INFLIGHT CONTINGENCIES</td>
<td>10–6–2</td>
</tr>
<tr>
<td>10–6–5. SERVICES TO RESCUE AIRCRAFT</td>
<td>10–6–3</td>
</tr>
</tbody>
</table>

**Section 7. Ground Missile Emergencies**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10–7–1. INFORMATION RELAY</td>
<td>10–7–1</td>
</tr>
<tr>
<td>10–7–2. IFR AND SVFR MINIMA</td>
<td>10–7–1</td>
</tr>
<tr>
<td>10–7–3. VFR MINIMA</td>
<td>10–7–1</td>
</tr>
<tr>
<td>10–7–4. SMOKE COLUMN AVOIDANCE</td>
<td>10–7–1</td>
</tr>
<tr>
<td>10–7–5. EXTENDED NOTIFICATION</td>
<td>10–7–1</td>
</tr>
</tbody>
</table>

**Chapter 11. Traffic Management Procedures**

<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11–1–1. DUTY RESPONSIBILITY</td>
<td>11–1–1</td>
</tr>
</tbody>
</table>
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. User Request Evaluation Tool (URET) – En Route

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. URET–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 URET 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. PRIMARY HOST OUTAGES ......................................... 13–1–6
13–1–17. URET AIRSPACE CONFIGURATION ELEMENTS ..................... 13–1–6

Section 2. Ocean21 – 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

Appendix A. Aircraft Information Fixed-Wing Aircraft ......................... Appendix A–1
Appendix B. Aircraft Information Helicopters/Rotorcrafts ...................... Appendix B–1
Appendix C. Aircraft Information Specific Homebuilt/Experimental Aircraft .......... Appendix C–1
<table>
<thead>
<tr>
<th>Paragraph</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix D. Standard Operating Practice (SOP) for the Transfer of Position</td>
<td>Appendix D–1</td>
</tr>
<tr>
<td>Responsibility</td>
<td></td>
</tr>
<tr>
<td>PILOT/CONTROLLER GLOSSARY</td>
<td>PCG–1</td>
</tr>
<tr>
<td>INDEX</td>
<td>I–1</td>
</tr>
</tbody>
</table>
Chapter 1. General

Section 1. Introduction

1–1–1. PURPOSE OF THIS ORDER

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

1–1–2. AUDIENCE

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

1–1–3. WHERE TO FIND THIS ORDER

This order is available on the FAA Web site at http://faa.gov/air_traffic/publications and http://employees.faa.gov/tools_resources/orders_notices/.

1–1–4. WHAT THIS ORDER CANCELS

FAA Order JO 7110.65S, Air Traffic Control, dated February 14, 2008, and all changes to it are canceled.

1–1–5. EXPLANATION OF CHANGES

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

1–1–6. SUBMISSION CUTOFF AND EFFECTIVE DATES

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

1–1–7. DELIVERY DATES

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

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

1–1–8. RECOMMENDATIONS FOR PROCEDURAL CHANGES

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

b. Recommendations from other sources should be submitted through appropriate FAA, military, or
industry/user channels to Headquarters, FAA, Vice President, Mission Support Services, attention: Airspace Services.

1–1–9. PROCEDURAL LETTERS OF AGREEMENT

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

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

1–1–10. CONSTRAINTS GOVERNING SUPPLEMENTS AND PROCEDURAL DEVIATIONS

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

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

TBL 1–1–3
Military Operations Interface Offices

<table>
<thead>
<tr>
<th>Branch</th>
<th>Address</th>
</tr>
</thead>
</table>
| U.S. Navy    | Department of the Navy  
Chief of Naval Operations  
N–885F  
2000 Navy Pentagon  
Washington, D.C.  20350–2000 |
| U.S. Air Force| HQ AFFSA/A3A  
Bldg 4 Room 240  
6500 S. MacArthur Blvd  
Oklahoma City, OK 73169  
Email: hqaffsa.a3a@tinker.af.mil |
| U.S. Army    | Director  
USAASA (MOAS–AS)  
9325 Gunston Road, Suite N319  
Ft. Belvoir, VA 22060–5582 |

NOTE–
Terminal: Headquarters USAF has delegated to Major Air Command, Directors of Operations (MAJCOM/DOS) authority to reduce same runway separation standards for military aircraft. These are specified and approved by affected ATC and user units. When applied, appropriate advisories may be required; e.g., “(A/C call sign) continue straight ahead on right side; F–16 landing behind on left.” “(A/C call sign) hold position on right side; F–5 behind on left.”

REFERENCE–
FAAO JO 7110.65, Para 3–1–3 Use of Active Runways.

1–1–11. SAFETY MANAGEMENT SYSTEM (SMS)

Every employee is responsible to ensure the safety of equipment and procedures used in the provision of services within the National Airspace System (NAS). Risk assessment techniques and mitigations, as appropriate, are intended for implementation of any planned safety significant changes within the NAS, as directed by FAA Order 1100.161, Air Traffic Safety Oversight. Direction regarding the SMS and its application can be found in the FAA Safety Management System Manual and FAA Order 1100.161. The SMS will be implemented through a period of transitional activities. (Additional information pertaining to these requirements and processes can be obtained by contacting the service area offices.)

1–1–12. REFERENCES TO FAA NON–AIR TRAFFIC ORGANIZATIONS

When references are made to regional office organizations that are not part of the Air Traffic Organization (i.e., Communications Center, Flight Standards, Airport offices, etc.), the facility should contact the FAA region where the facility is physically located – not the region where the facility’s service area office is located.

1–1–13. DISTRIBUTION

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

NOTE—
Air carrier and other civil aircraft having FAA authorized call signs may be pronounced using single digits if necessary for clarity.

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

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

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

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

EXAMPLE—
“Lifeguard Delta Fifty–One.”

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

EXAMPLE—
“Lifeguard Two Six Four Six.”

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

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

EXAMPLE—
“Navy Five Six Seven One Three.”
“Coast Guard Six One Three Two Seven.”
“Air Guard One Three Five Eight Six.”
“Army Copter Three Two One Seven Six.”

NOTE—
If aircraft identification becomes a problem, the procedures reflected in FAAO JO 7210.3, Facility Operation and Administration, para 2–1–13, Aircraft Identification Problems, will apply.

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

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

EXAMPLE—
“Air Evac One Seven Six Five Two.”

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

EXAMPLE—
“Air Force Rescue Six One Five Seven Niner.”

(e) Air Mobility Command. “REACH.”

EXAMPLE—
“Reach Seven Eight Five Six Two.”

(f) Special Air Mission. “SAM.”

EXAMPLE—
“Sam Niner One Five Six Two.”

(g) USAF Contract Aircraft “LOGAIR.”

EXAMPLE—
“Logair Seven Five Eight Two Six.”

(h) Military tactical and training:

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

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

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

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

EXAMPLE—
“Navy Golf Alfa Two One.”
“Marine Four Charlie Two Three Six.”

7. Presidential aircraft and Presidential family aircraft:

(a) When the President is aboard a military aircraft, state the name of the military service, followed by the word “One.”
EXAMPLE–
“Air Force One.”
“Army One.”
“Marine One.”

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

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

REFERENCE–
FAAO JO 7110.65, Para 2–1–4 Operational Priority.

8. Vice Presidential aircraft:

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

EXAMPLE–
“Air Force Two.”
“Army Two.”
“Marine Two.”

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

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

REFERENCE–
FAAO JO 7110.65, Para 2–1–4 Operational Priority.

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

TBL 2–4–2
DOT and FAA Alphanumeric Identifiers and Call Signs

<table>
<thead>
<tr>
<th>Official</th>
<th>Identifier</th>
<th>Call Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretary of Transportation</td>
<td>DOT–1</td>
<td>Transport–1</td>
</tr>
<tr>
<td>Deputy Secretary of Transportation</td>
<td>DOT–2</td>
<td>Transport–2</td>
</tr>
<tr>
<td>Administrator, Federal Aviation Admin.</td>
<td>FAA–1</td>
<td>Safeair–1</td>
</tr>
<tr>
<td>Deputy Administrator, Federal Aviation</td>
<td>FAA–2</td>
<td>Safeair–2</td>
</tr>
</tbody>
</table>

10. Other Special Flights.

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

EXAMPLE–
“Romeo Alfa Charlie One Six Five Three.”

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

EXAMPLE–
“Flight Check Three Niner Six Five Four.”

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

EXAMPLE–
“SAMP Three One Six.”

REFERENCE–
FAAO JO 7110.65, Para 9–2–17 SAMP.

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

b. Foreign registry. State one of the following:

1. Civil. State the aircraft type or the manufacturer’s name followed by the letters/numbers of the aircraft registration, or state the letters or digits of the aircraft registration or call sign.

EXAMPLE–
“Stationair F–L–R–B.”
“C–F–L–R–B.”

NOTE–
Letters may be spoken individually or phonetically.

2. Air carrier. The abbreviated name of the operating company followed by the letters or digits of the registration or call sign.

EXAMPLE–
“Air France F–L–R–G.”

3. The flight number in group form, or you may use separate digits if that is the format used by the pilot.

EXAMPLE–
“Scandinavian Sixy–eight.”
“Scandinavian Six Eight.”

4. Foreign Military. Except for military services identified in FAA Order JO 7340.2, Contractions, the name of the country and the military service followed by the separate digits or letters of the registration or call sign. For military services listed in FAA Order JO 7340.2, the approved telephony followed by the separate digits of the serial number.
EXAMPLE—
“Canforce Five Six Two Seven.”
“Brazilian Air Force Five Three Two Seven Six.”

2–4–21. DESCRIPTION OF AIRCRAFT TYPES

Except for heavy aircraft, describe aircraft as follows when issuing traffic information.

a. Military:
   1. Military designator, with numbers spoken in group form, or
   2. Service and type, or
   3. Type only if no confusion or misidentification is likely.

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

EXAMPLE—
“L–Ten–Eleven.”
“American MD–Eighty. Seven Thirty–Seven.”
“Boeing Seven Fifty–Seven.”

NOTE—
Pilots of “interchange” aircraft are expected to inform the tower on the first radio contact the name of the operating company and trip number followed by the company name, as displayed on the aircraft, and the aircraft type.

c. General Aviation and Air Taxi:
   1. Manufacturer’s model, or designator.
   2. Manufacturer’s name, or add color when considered advantageous.

EXAMPLE—
“Tri–Pacer”
“PA Twenty–Two.”
“Cessna Four–Oh–One.”
“Blue and white King Air.”
“Airliner.”
“Sikorsky S–Seventy–Six.”

d. When issuing traffic information to aircraft following a heavy jet, specify the word “heavy” before the manufacturer’s name and model.

EXAMPLE—
“Heavy L–Ten–Eleven.”
“Heavy C–Five.”
“Heavy Boeing Seven Forty–Seven.”

REFERENCE—
FAO JO 7110.65, Para 2–1–21 Traffic Advisories.

2–4–22. AIRSPACE CLASSES

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

EXAMPLE—
“Cessna 123 Mike Romeo cleared to enter Bravo airspace.”
“Sikorsky 123 Tango Sierra cleared to enter New York Bravo airspace.”
3–1–8. LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES

a. When low level wind shear/microburst is reported by pilots, Integrated Terminal Weather System (ITWS), or detected on wind shear detection systems such as LLWAS NE++, LLWAS–RS, WSP, or TDWR, controllers must issue the alert to all arriving and departing aircraft. Continue the alert to aircraft until it is broadcast on the ATIS and pilots indicate they have received the appropriate ATIS code. A statement must be included on the ATIS for 20 minutes following the last report or indication of the wind shear/microburst.

PHRASEOLOGY—
LOW LEVEL WIND SHEAR (or MICROBURST, as appropriate) ADVISORIES IN EFFECT.

NOTE—
Some aircraft are equipped with Predictive Wind Shear (PWS) alert systems that warn the flight crew of a potential wind shear up to 3 miles ahead and 25 degrees either side of the aircraft heading at or below 1200’ AGL. Pilot reports may include warnings received from PWS systems.

REFERENCE—
FAAAO JO 7110.65, Para 2–6–3 PIREP Information.
FAAAO JO 7110.65, Para 2–9–3 Content.
FAAAO JO 7110.65, Para 3–10–1 Landing Information.

b. At facilities without ATIS, ensure that wind shear/microburst information is broadcast to all arriving and departing aircraft for 20 minutes following the last report or indication of wind shear/microburst.

1. At locations equipped with LLWAS, the local controller must provide wind information as follows:

NOTE—
The LLWAS is designed to detect low level wind shear conditions around the periphery of an airport. It does not detect wind shear beyond that limitation.

REFERENCE—

(a) If an alert is received, issue the airport wind and the displayed field boundary wind.

PHRASEOLOGY—
WIND SHEAR ALERT. AIRPORT WIND (direction) AT (velocity). (Location of sensor) BOUNDARY WIND (direction) AT (velocity).

EXAMPLE—
17A MBA 40K–3MF

PHRASEOLOGY—
RUNWAY 17 ARRIVAL MICROBURST ALERT 40 KNOT LOSS 3 MILE FINAL.

EXAMPLE—
17D WSA 25K+ 2MD

PHRASEOLOGY—
RUNWAY 17 DEPARTURE WIND SHEAR ALERT 25 KNOT GAIN 2 MILE DEPARTURE.

(b) If requested by the pilot or deemed appropriate by the controller, issue the displayed wind information oriented to the threshold or departure end of the runway.

PHRASEOLOGY—
(Runway) DEPARTURE/THRESHOLD WIND (direction) AT (velocity).
(c) LLWAS NE++ or LLWAS−RS may detect a possible wind shear/microburst at the edge of the system but may be unable to distinguish between a wind shear and a microburst. A wind shear alert message will be displayed, followed by an asterisk, advising of a possible wind shear outside of the system network.

NOTE—
LLWAS NE++ when associated with TDWR can detect wind shear/microbursts outside the network if the TDWR fails.

PHRASEOLOGY—
(Appropriate wind or alert information) POSSIBLE WIND SHEAR OUTSIDE THE NETWORK.

(d) If unstable conditions produce multiple alerts, issue an advisory of multiple wind shear/microburst alerts followed by specific alert or wind information most appropriate to the aircraft operation.

PHRASEOLOGY—
MULTIPLE WIND SHEAR/MICROBURST ALERTS (specific alert or wind information).

(e) The LLWAS NE++ and LLWAS−RS are designed to operate with as many as 50 percent of the total sensors inoperative. When all three remote sensors designated for a specific runway arrival or departure wind display line are inoperative then the LLWAS NE++ and LLWAS−RS for that runway arrival/departure must be considered out of service. When a specific runway arrival or departure wind display line is inoperative and wind shear/microburst activity is likely; (for example, frontal activity, convective storms, PIREPs), the following statement must be included on the ATIS, “WIND SHEAR AND MICROBURST INFORMATION FOR RUNWAY (runway number) ARRIVAL/DEPARTURE NOT AVAILABLE.”

NOTE—
The geographic situation display (GSD) is a supervisory planning tool and is not intended to be a primary tool for microburst or wind shear.

c. Wind Shear Escape Procedures.

1. If an aircraft under your control informs you that it is performing a wind shear escape, do not issue control instructions that are contrary to pilot actions. ATC should continue to provide safety alerts regarding terrain or obstacles and traffic advisories for the escape aircraft, as appropriate.

EXAMPLE—
“Denver Tower, United 1154, wind shear escape.”

NOTE—
Aircraft that execute a wind shear escape maneuver will usually conduct a full power climb straight ahead and will not accept any control instructions until onboard systems advise the crew or the pilot in command (PIC) advises ATC that the escape maneuver is no longer required.

REFERENCE—
P/CG Term – Wind Shear Escape

2. Unless advised by additional aircraft that they are also performing an escape procedure, do not presume that other aircraft in the proximity of the escape aircraft are responding to wind shear alerts/events as well. Continue to provide control instructions, safety alerts, and traffic advisories, as appropriate.

3. Once the responding aircraft has initiated a wind shear escape maneuver, the controller is not responsible for providing standard separation between the aircraft that is responding to an escape and any other aircraft, airspace, terrain, or obstacle. Responsibility for separation resumes when one of the following conditions are met:

(a) Departures:

(1) A crew member informs ATC that the wind shear escape maneuver is complete and ATC observes that standard separation has been re-established, or

(2) A crew member informs ATC that the escape maneuver is complete and has resumed a previously assigned departure clearance/routing.

(b) Arrivals:

(1) A crew member informs ATC that the escape maneuver is complete, and

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

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

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

Or

“Denver Tower, United 1154, wind shear escape complete, request further instructions.”
3–1–9. USE OF TOWER RADAR DISPLAYS

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

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

REFERENCE—

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

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

NOTE—
This authorization does not alter visual separation procedures. When employing visual separation, the provisions of para 7–2–1 Visual Separation, apply unless otherwise authorized by the Vice President of Terminal Service.

REFERENCE—
FAAO JO 7110.65, Para 5–3–2 Primary Radar Identification Methods.

2. To provide aircraft with radar traffic advisories.

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

PHRASEOLOGY—
(Identification), PROCEED (direction)—BOUND, (other instructions or information as necessary),
or

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

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

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

EXAMPLE—
“TURN BASE LEG NOW.”

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

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

REFERENCE—
FAAO JO 7110.65, Para 5–5–4 Minima.

3–1–10. OBSERVED ABNORMALITIES

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

PHRASEOLOGY—
(Item) APPEAR/S (observed condition).

EXAMPLE—
“Landing gear appears up.”
“Landing gear appears down and in place.”
“Rear baggage door appears open.”

3–1–11. SURFACE AREA RESTRICTIONS

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

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

REFERENCE—
FAAO JO 7110.65, Para 2–1–16 Surface Areas.

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

EXCEPTION. A pilot’s request to conduct aerobatic practice activities may be approved, when operating in accordance with a letter of agreement, and the activity will have no adverse effect on safety of the air traffic operation or result in a reduction of service to other users.

REFERENCE—
FAAO JO 7210.3, Para 5–4–7, Aerobatic Practice Areas.

NOTE—
These unusual maneuvers include unnecessary low passes, unscheduled flybys, practice instrument approaches to altitudes below specified minima (unless a landing or touch-and-go is to be made), or any so-called “buzz jobs” wherein a flight is conducted at a low altitude and/or a high rate of speed for thrill purposes. Such maneuvers increase hazards to persons and property and contribute to noise complaints.

3–1–12. VISUALLY SCANNING RUNWAYS

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

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

3–1–13. ESTABLISHING TWO-WAY COMMUNICATIONS

Pilots are required to establish two-way radio communications before entering the Class D airspace. If the controller responds to a radio call with, “(a/c call sign) standby,” radio communications have been established and the pilot can enter the Class D airspace. If workload or traffic conditions prevent immediate provision of Class D services, inform the pilot to remain outside the Class D airspace until conditions permit the services to be provided.

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

REFERENCE—
FAAO JO 7110.65, Para 7–2–1 Visual Separation.

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

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

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

b. Provide for a rolling takeoff for all departures.

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

REFERENCE—

3–1–15. GROUND OPERATIONS RELATED TO THREE–HOUR TARMAC RULE

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

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

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

NOTE—
Facility procedures, including actions that constitute a significant disruption, vary by airport and must be identified in the facility directive pertaining to the Three–hour Tarmac Rule.

PHRASEOLOGY—
(Identification) TAXI TO (ramp, gate, or alternate deplaning area) VIA (route).

or

(Identification) EXPECT A (number) MINUTE DELAY DUE TO (ground and/or landing and/or departing) TRAFFIC,

or
(Identification) UNABLE DUE TO OPERATIONAL DISRUPTION.

REFERENCE—DOT Rule, Enhancing Airline Passenger Protections, 14 CFR, Part 259, commonly referred to as the Three-hour Tarmac Rule.
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—
FAAO 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—
FAAO JO 7210.3, Para 2–10–6, Broadcast Density Altitude Advisory.

g. Issue braking action for the runway in use as received from pilots or the airport management when Braking Action Advisories are in effect.

REFERENCE—
FAAO JO 7110.65, Para 2–7–2 Altimeter Setting Issuance Below Lowest Usable FL.
FAAO JO 7110.65, Para 3–1–8 Low Level Wind Shear/Microburst Advisories.
FAAO JO 7110.65, Para 3–3–5 Braking Action Advisories.
P/CG Term—Braking Action Advisories.

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—
FAAO 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 shall 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 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—FAAO 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.

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.

(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.

PHRASEOLOGY—RUNWAY (number), CONTINUE, TRAFFIC HOLDING IN POSITION.

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

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—FAAO JO 7110.65, Para 3–10–5 Landing Clearance.
3–11–4. HELICOPTER ARRIVAL SEPARATION

Separate an arriving helicopter from other helicopters by ensuring that it does not land until one of the following conditions exists:

a. A preceding, arriving helicopter has come to a stop or taxied off the landing area. (See FIG 3–11–3 and FIG 3–11–4.)

\[FIG\ 3–11–3\]
Helicopter Arrival Separation

\[FIG\ 3–11–4\]
Helicopter Arrival Separation

b. A preceding, departing helicopter has left the landing area. (See FIG 3–11–5.)

\[FIG\ 3–11–5\]
Helicopter Arrival Separation

3–11–5. SIMULTANEOUS LANDINGS OR TAKEOFFS

Authorize helicopters to conduct simultaneous landings or takeoffs if the distance between the landing or takeoff points is at least 200 feet and the courses to be flown do not conflict. Refer to surface markings to determine the 200 foot minimum, or instruct a helicopter to remain at least 200 feet from another helicopter. (See FIG 3–11–6.)

\[FIG\ 3–11–6\]
Simultaneous Helicopter Landings or Takeoffs
3–11–6. HELICOPTER LANDING CLEARANCE

a. Issue landing clearances to helicopters going to movement areas other than active runways or from diverse directions to points on active runways, with additional instructions as necessary. Whenever possible, issue a landing clearance in lieu of extended hover–taxi or air–taxi operations.

**PHRASEOLOGY** - MAKE APPROACH STRAIGHT–IN/CIRCLING LEFT/RIGHT TURN TO (location, runway, taxiway, helipad, Maltese cross) ARRIVAL/ARRIVAL ROUTE (number, name, or code).

HOLD SHORT OF (active runway, extended runway centerline, other).

REMAIN (direction/distance; e.g., 700 feet, 1 1/2 miles) OF/FROM (runway, runway centerline, other helicopter/aircraft).

CAUTION (power lines, unlighted obstructions, wake turbulence, etc.).

CLEARED TO LAND.

b. If landing is requested to non-movement areas, an area not authorized for helicopter use, or an area off the airport, and, in your judgment, the operation appears to be reasonable, use the following phraseology instead of the landing clearance in subpara a.

**PHRASEOLOGY** - LANDING AT (requested location) WILL BE AT YOUR OWN RISK (additional instructions, as necessary). USE CAUTION (if applicable).

c. Unless agreed to by the pilot, do not issue downwind landings if the tailwind exceeds 5 knots.

**NOTE** - A pilot request to land at a given point from a given direction constitutes agreement.
4–2–8. IFR–VFR AND VFR–IFR FLIGHTS

a. Clear an aircraft planning IFR operations for the initial part of flight and VFR for the latter part to the fix at which the IFR part ends.

b. Treat an aircraft planning VFR for the initial part of flight and IFR for the latter part as a VFR departure. Issue a clearance to this aircraft when it requests IFR clearance approaching the fix where it proposes to start IFR operations. The phraseology CLEARED TO (destination) AIRPORT AS FILED may be used with abbreviated departure clearance procedures.

REFERENCE—
FAAO JO 7110.65, Para 4–3–3 Abbreviated Departure Clearance.

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

d. When a VFR aircraft, operating below the minimum altitude for IFR operations, requests an IFR clearance and you are aware that the pilot is unable to climb in VFR conditions to the minimum IFR altitude:

1. Before issuing a clearance, ask if the pilot is able to maintain terrain and obstruction clearance during a climb to the minimum IFR altitude.

NOTE—
Pilots of pop–up aircraft are responsible for terrain and obstacle clearance until reaching minimum instrument altitude (MIA) or minimum en route altitude (MEA). Pilot compliance with an approved FAA procedure or an ATC instruction transfers that responsibility to the FAA; therefore, do not assign (or imply) specific course guidance that will (or could) be in effect below the MIA or MEA.

EXAMPLE—
“November Eight Seven Six, are you able to provide your own terrain and obstruction clearance between your present altitude and six thousand feet?”

2. If the pilot is able to maintain terrain and obstruction separation, issue the appropriate clearance as prescribed in para 4–2–1, Clearance Items, and para 4–5–6, Minimum En Route Altitudes.

3. If unable to maintain terrain and obstruction separation, instruct the pilot to maintain VFR and to state intentions.

4. If appropriate, apply the provisions of para 10–2–7, VFR Aircraft In Weather Difficulty, or para 10–2–9, Radar Assistance Techniques, as necessary.

4–2–9. CLEARANCE ITEMS

The following guidelines shall be utilized to facilitate the processing of airfile aircraft:

a. Ensure the aircraft is within your area of jurisdiction unless otherwise coordinated.

b. Obtain necessary information needed to provide IFR service.

c. Issue clearance to destination, short range clearance, or an instruction to the pilot to contact a FSS or AFSS if the flight plan cannot be processed.

NOTE—
These procedures do not imply that the processing of airfiles has priority over another ATC duty to be performed.

REFERENCE—
FAAO JO 7110.65, Para 2–2–1 Recording Information.

4–2–10. CANCELLATION OF IFR FLIGHT PLAN

a. If necessary, before instructing an IFR aircraft arriving at an airport not served by an air traffic control tower or flight service station to change to the common traffic advisory frequency, provide the pilot with instructions on how to cancel his/her IFR flight plan.

1. Airports with an air/ground communications station:

PHRASEOLOGY—
(Call sign) REPORT CANCELLATION OF IFR ON (frequency).

2. Airports without an air/ground communications station:

PHRASEOLOGY—
(Call sign) REPORT CANCELLATION OF IFR THIS FREQUENCY OR WITH FLIGHT SERVICE.
Or
(Call sign) REPORT CANCELLATION OF IFR THIS FREQUENCY OR WITH (FSS serving the area or the ATC controlling facility).

EXAMPLE—
“N13WA report cancellation of IFR this frequency or with McAlester Radio.”
b. Respond to a pilot’s cancellation of his/her IFR flight plan as follows:

**PHRASEOLOGY—**

(Call sign) IFR CANCELLATION RECEIVED.
f. For GPS UNRELIABLE NOTAMs, inform pilots requesting a GPS or RNAV approach that GPS is unreliable and clear the aircraft for the approach. This advisory may be omitted if contained in the Automated Terminal Information System (ATIS) broadcast.

g. For pilot reported GPS anomalies, advise subsequent aircraft requesting a GPS or RNAV approach that GPS is unreliable and clear the aircraft for the approach. This advisory may be discontinued after 15 minutes if no subsequent reports are received.

REFERENCE−
FAAO JO 7110.65, Para 2−1−10 NAVAID Malfunctions.
FAAO JO 7110.65, Para 4−7−12 Airport Conditions.

PHRASEOLOGY−
CLEARED (approach), GPS UNRELIABLE.

h. For Wide Area Augmentation System (WAAS) UNAVAILABLE NOTAMs, advise aircraft requesting a GPS or RNAV approach that WAAS is unavailable and clear the aircraft for the approach. This advisory may be omitted if contained in the ATIS broadcast.

PHRASEOLOGY−
CLEARED (approach), WAAS UNAVAILABLE.

NOTE−
1. WAAS UNAVAILABLE NOTAMs indicate a failure of a WAAS system component. GPS/WAAS equipment reverts to GPS only operation and satisfies the requirements for basic GPS equipment.

2. WAAS UNRELIABLE NOTAMs indicate predictive coverage, are published for pilot preflight planning, and do not require any controller action.

4−8−2. CLEARANCE LIMIT

Issue approach or other clearances, as required, specifying the destination airport as the clearance limit if airport traffic control service is not provided even though this is a repetition of the initial clearance.

4−8−3. RELAYED APPROACH CLEARANCE

TERMINAL

Include the weather report, when it is required and available, when an approach clearance is relayed through a communication station other than an air carrier company radio. You may do this by telling the station to issue current weather.

4−8−4. ALTITUDE ASSIGNMENT FOR MILITARY HIGH ALTITUDE INSTRUMENT APPROACHES

Altitudes above those shown on the high altitude instrument approach procedures chart may be specified when required for separation.

NOTE−
To preclude the possibility of aircraft exceeding rate-of-descent or airspeed limitations, the maximum altitudes which may be assigned for any portion of the high altitude instrument approach procedure will be determined through coordination between the ATC facility concerned and the military authority which originated the high altitude instrument approach procedure.

REFERENCE−
FAAO JO 7110.65, Para 4−7−5 Military Turbojet En Route Descent.

4−8−5. SPECIFYING ALTITUDE

Specify in the approach clearance the altitude shown in the approach procedures when adherence to that altitude is required for separation. When vertical separation will be provided from other aircraft by pilot adherence to the prescribed maximum, minimum, or mandatory altitudes, the controller may omit specifying the altitude in the approach clearance.

NOTE−
Use FAA or NGA instrument approach procedures charts appropriate for the aircraft executing the approach.

4−8−6. CIRCLING APPROACH

a. Circling approach instructions may only be given for aircraft landing at airports with operational control towers.

b. Include in the approach clearance instructions to circle to the runway in use if landing will be made on a runway other than that aligned with the direction of instrument approach. When the direction of the circling maneuver in relation to the airport/runway is required, state the direction (eight cardinal compass points) and specify a left or right base/downwind leg as appropriate.

PHRASEOLOGY−
CIRCLE TO RUNWAY (number),

or

CIRCLE (direction using eight cardinal compass points) OF THE AIRPORT/RUNWAY FOR A LEFT/RIGHT BASE/DOWNWIND TO RUNWAY (number).
NOTE—
Where standard instrument approach procedures (SIAPs) authorize circling approaches, they provide a basic minimum of 300 feet of obstacle clearance at the MDA within the circling area considered. The dimensions of these areas, expressed in distances from the runways, vary for the different approach categories of aircraft. In some cases a SIAP may otherwise restrict circling approach maneuvers.

c. Do not issue clearances, such as “extend downwind leg,” which might cause an aircraft to exceed the circling approach area distance from the runways within which required circling approach obstacle clearance is assured.

4–8–7. SIDE–STEP MANEUVER

TERMINAL

Side-step Maneuver. When authorized by an instrument approach procedure, you may clear an aircraft for an approach to one runway and inform the aircraft that landing will be made on a parallel runway.

EXAMPLE—
“Cleared I–L–S Runway seven left approach. Side-step to runway seven right.”

NOTE—
Side-step maneuvers require higher weather minima/MDA. These higher minima/MDA are published on the instrument approach charts.

REFERENCE—
FAAO JO 7110.65, Para 3–3–2 Closed/Unsafe Runway Information.  
P/CG Term– Side–step Maneuver.

4–8–8. COMMUNICATIONS RELEASE

If an IFR aircraft intends to land at an airport not served by a tower or FSS, approve a change to the advisory service frequency when you no longer require direct communications.

PHRASEOLOGY—
CHANGE TO ADVISORY FREQUENCY APPROVED.

NOTE—
An expeditious frequency change permits the aircraft to receive timely local airport traffic information in accordance with AC 90–42, Traffic Advisory Practices at Airports Without Operating Control Towers.

4–8–9. MISSED APPROACH

Except in the case of a VFR aircraft practicing an instrument approach, an approach clearance automatically authorizes the aircraft to execute the missed approach procedure depicted for the instrument approach being flown. An alternate missed approach procedure as published on the appropriate FAA Form 8260 or appropriate military form may be assigned when necessary. Once an aircraft commences a missed approach, it may be radar vectored.

NOTE—
1. Alternate missed approach procedures are published on the appropriate FAA Form 8260 or appropriate military form and require a detailed clearance when they are issued to the pilot.

2. In the event of a missed approach involving a turn, unless otherwise cleared, the pilot will proceed to the missed approach point before starting that turn.

REFERENCE—
FAAO JO 7110.65, Para 4–8–1, Practice Approaches.  
FAAO JO 7110.65, Para 5–6–3 Vectors Below Minimum Altitude.  
FAAO JO 7110.65, Para 5–8–3 Successive or Simultaneous Departures.  
FAAO 8260.19, Flight Procedures and Airspace, Paras 404 and 815.  
FAAO 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), Paras 275, 278, 943, 957, and 997.

4–8–10. APPROACH INFORMATION

Specify the following in the approach clearance when the pilot says he/she is unfamiliar with the procedure:

a. Initial approach altitude.

b. Direction and distance from the holding fix within which procedure turn is to be completed.

c. Altitude at which the procedure turn is to be made.

d. Final approach course and altitude.

e. Missed approach procedures if considered necessary.

PHRASEOLOGY—
INITIAL APPROACH AT (altitude), PROCEDURE TURN AT (altitude), (number) MINUTES/MILES (direction), FINAL APPROACH ON (name of NAVAID) (specified) COURSE/RADIAL/AZIMUTH AT (altitude).

4–8–11. PRACTICE APPROACHES

Except for military aircraft operating at military airfields, ensure that neither VFR nor IFR practice approaches disrupt the flow of other arriving and departing IFR or VFR aircraft. Authorize, withdraw
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 para 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—**
FAAO JO 7110.65, Para 4–2–8 IFR-VFR and VFR-IFR Flights.
FAAO JO 7110.65, Para 5–2–3 Nondiscrete Environment.
FAAO JO 7110.65, Para 5–2–4 Mixed Environment.
FAAO JO 7110.65, Para 5–2–9 VFR Code Assignments.

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—**

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

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

2. **EN ROUTE.** An appropriate keyboard entry shall 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 para 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—**

5–2–9. 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. Para 5−2−2 Discrete Environment; para 5−2−3 Nondiscrete Environment, and para 5−2−4 Mixed Environment, specify code assignment procedures to follow for the three code environments.

2. Para 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.

REFERENCE—
FAAO 7110.66, National Beacon Code Allocation Plan.

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

REFERENCE—
FAAO JO 7110.65, Para 5−3−3 Beacon Identification Methods.

5−2−10. 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 FAAO 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—
FAAO JO 7110.65, Para 5−3−3 Beacon Identification Methods.

5−2−11. 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 FAAO 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—
FAAO JO 7110.65, Para 5−3−3 Beacon Identification Methods.
Section 5. Radar Separation

5–5–1. APPLICATION

a. Radar separation shall be applied to all RNAV aircraft operating on a random (impromptu) route at or below FL 450 and to all published Q routes in the conterminous United States.

EN ROUTE

EXCEPTION. Aircraft equipped with IFR-certified GPS systems operating on point-to-point RNAV routes within the Anchorage Air Route Traffic Control Center (ARTCC) controlled airspace (excluding oceanic airspace) where ATC surveillance coverage is not available, may be provided nonradar separation, in lieu of radar separation, when an operational advantage will be gained.

REFERENCE–
FAA JO 7110.65, Para 2–1–3, Procedural Preference
FAA JO 7110.65, Para 4–1–2, Exceptions
FAA JO 7110.65, Para 6–5–4, Minima Along Other Than Established Airways or Routes

b. Radar separation may be applied between:

1. Radar identified aircraft.

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

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

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

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

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

      (1) When less than 40 miles from the antenna—6 miles;
      (2) When 40 miles or more from the antenna—10 miles;
      (3) Narrowband radar operations—10 miles; and
      (d) Radar separation is maintained between the radar-identified aircraft and all observed primary, ASR–9/Full Digital Radar Primary Symbol, and secondary radar targets until nonradar separation is established from the aircraft not radar identified; and

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

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

5–5–2. TARGET SEPARATION

a. Apply radar separation:

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

2. Between the ends of beacon control slashes.

NOTE–
At TPX–42 sites, the bracket video feature must be activated to display the beacon control slash.

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

4. All–digital displays. Between the centers of digitized targets. Do not allow digitized targets to touch.

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

5–5–3. TARGET RESOLUTION

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

b. Mandatory traffic advisories and safety alerts shall be issued when this procedure is used.
NOTE-
This procedure shall not be provided utilizing mosaic radar systems.

c. Target resolution shall be applied as follows:

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

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

3. Between the ends of two beacon control slashes.

5–5–4. MINIMA

Separate aircraft by the following minima:

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

NOTE-
Includes single sensor long range radar mode.

1. When less than 40 miles from the antenna—3 miles.

2. When 40 miles or more from the antenna—5 miles.

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

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

b. Stage A/DARC, MEARTS Mosaic Mode, Terminal Mosaic/Multi–Sensor Mode:

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

1. Below FL 600—5 miles.

2. At or above FL 600—10 miles.

3. For areas meeting all of the following conditions:

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

   (b) Significant operational advantages can be obtained.

   (c) Within 40 miles of the antenna.

   (d) Below FL 180.

   (e) Facility directives specifically define the area where the separation can be applied. Facility directives may specify 3 miles.

REFERENCE–
FAAO JO 7210.3, Para 8–2–1, Single Site Coverage Stage A Operations.

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

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

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

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

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

c. MEARTS Mosaic Mode:

NOTE—

1. Sensor Mode displays information from the radar input of a single site.

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

   1. When less than 40 miles from the antenna—3 miles.

   2. When 40 miles or more from the antenna—5 miles.

d. STARS Multi–Sensor Mode:

NOTE–

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

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

3. TRK appears in the data block whenever the aircraft is being tracked by a radar site other than the radar currently....
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—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—FAAO JO 7110.65, Para 10–2–4 Altitude Change for Improved Reception.

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)/front line manager (FLM)/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/FLM/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) 493–4170.
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—FAAO JO 7210.3, Para 2–1–29, REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT
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

a. Terms Added:
   WIND SHEAR ESCAPE

b. Terms Modified:
   AIRPORT LIGHTING
   NATIONAL GEOSPATIAL–INTELLIGENCE AGENCY (NGA)

c. Editorial/format changes were made where necessary. Revision bars were not used due to the insignificant nature of the changes.
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—
(See AIRMET.)

AIRMET—In-flight weather advisories issued only to amend the 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 obscuration.

(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/FACILITY DIRECTORY—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.

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.

(Remainder text not visible in the image.)
AN/TPX-42 Interrogator System. The Navy has two adaptations of the DAIR System-Carrier Air Traffic Control Direct Altitude and Identification Readout System for Aircraft Carriers and Radar Air Traffic Control Facility Direct Altitude and Identity Readout System for land-based terminal operations. The DAIR detects, tracks, and predicts secondary radar aircraft targets. Targets are displayed by means of computer-generated symbols and alphanumeric characters depicting flight identification, altitude, ground speed, and flight plan data. The DAIR System is capable of interfacing with ARTCCs.

DIRECTION FINDER– A radio receiver equipped with a directional sensing antenna used to take bearings on a radio transmitter. Specialized radio direction finders are used in aircraft as air navigation aids. Others are ground-based, primarily to obtain a “fix” on a pilot requesting orientation assistance or to locate downed aircraft. A location “fix” is established by the intersection of two or more bearing lines plotted on a navigational chart using either two separately located Direction Finders to obtain a fix on an aircraft or by a pilot plotting the bearing indications of his/her DF on two separately located ground-based transmitters, both of which can be identified on his/her chart. UDFs receive signals in the ultra high frequency radio broadcast band; VDFs in the very high frequency band; and UVDFs in both bands. ATC provides DF service at those air traffic control towers and flight service stations listed in the Airport/Facility Directory and the DOD FLIP IFR En Route Supplement.

(See DF FIX.)
(See DF GUIDANCE.)

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 Airport/Facility Directory 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– Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

(See MICROWAVE LANDING SYSTEM.)
(See TACAN.)
(See VORTAC.)

DISTRESS– A condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.

DIVE BRAKES–
(See SPEED BRAKES.)

DIVERSE VECTOR AREA– In a radar environment, that area in which a prescribed departure route is not required as the only suitable route to avoid obstacles. The area in which random radar vectors below the MVA/MIA, established in accordance with the TERPS criteria for diverse departures, obstacles and terrain avoidance, may be issued to departing aircraft.

DIVERSION (DVRSN)– Flights that are required to land at other than their original destination for reasons beyond the control of the pilot/company, e.g. periods of significant weather.

DME–
(See DISTANCE MEASURING EQUIPMENT.)
DME FIX-- A geographical position determined by reference to a navigational aid which provides distance and azimuth information. It is defined by a specific distance in nautical miles and a radial, azimuth, or course (i.e., localizer) in degrees magnetic from that aid.

(See DISTANCE MEASURING EQUIPMENT.)
(See FIX.)
(See MICROWAVE LANDING SYSTEM.)

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.

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 FAAO 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.
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 area forecast, as they affect the operation of air traffic and as prepared by the NWS.
(See AIRMET.)
(See SIGMET.)

WHEN ABLE– When used in conjunction with ATC instructions, gives the pilot the latitude to delay compliance until a condition or event has been reconciled. Unlike “pilot discretion,” when instructions are prefaced “when able,” the pilot is expected to seek the first opportunity to comply. Once a maneuver has been initiated, the pilot is expected to continue until the specifications of the instructions have been met. “When able,” should not be used when expeditious compliance is required.

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.

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.”

WORLD AERONAUTICAL CHARTS–
(See AERONAUTICAL CHART.)

WS–
(See SIGMET.)
(See WEATHER ADVISORY.)

WST–
(See CONVECTIVE SIGMET.)
(See WEATHER ADVISORY.)
INDEX

[References are to page numbers]

A
Abbreviated Departure Clearance, 4–3–3
Abbreviated Transmissions, 2–4–2
Abbreviations, 1–2–3
Additional Separation for Formation Flights, 5–5–4
Adjacent Airspace, 5–5–5
Adjusted Minimum Flight Level, 4–5–2
Advance Descent Clearance, 4–7–1
Aerial Refueling, 9–2–6
Air Defense Exercise Beacon Code Assignment, 5–2–4
Air Traffic Service (ATS) Routes, 2–5–1
Air Traffic Services Interfacility Data Communications (AIDC), 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 Information (Experimental), Appendix C–1
Aircraft Information (Fixed–Wing), Appendix A–1
Aircraft Information (Helicopters), Appendix B–1
Aircraft Information (Homebuilt), Appendix C–1
Aircraft Information (Rotorcraft), Appendix B–1
Aircraft Orientation, 10–2–1
Aircraft Position Plots, 10–3–2
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
Airspace Classes, 2–4–11
AIT, 5–4–5
Alignment Accuracy Check (Radar), 5–1–1
ALNOT, 10–3–2
ALNOT Cancellation, 10–3–2
ALS Intensity Settings, 3–4–2
ALSF–2/SSALR, 3–4–3
Alternative Routes, 4–4–3
Altimeter Setting (Oceanic), 8–1–1
Altimeter Settings, 2–7–1
Altitude Amendments, 4–2–1
Altitude and Distance Limitations, 4–1–1
Altitude Assignment and Verification, 4–5–1
Altitude Assignment for Military High Altitude Instrument Approaches, 4–8–5
Altitude Confirmation – Mode C, 5–2–7
Altitude Confirmation – Non–Mode C, 5–2–7
Altitude Confirmation – Nonradar, 4–5–7
Altitude Filters (Beacon), 5–2–8
Altitude for Direction of Flight (IFR), 4–5–1
Altitude for Direction of Flight (OTP), 7–3–2
Altitude Instructions, 4–5–3
Altitude Restricted Low Approach, 3–10–8
ALTRV Clearance, 4–2–2
ALTRV Information, 2–2–2
Annotations, 1–2–3
Anticipated Altitude Changes, 4–5–6
Anticipating Separation (ATCT – Arrival), 3–10–7
Anticipating Separation (ATCT – Departure), 3–9–4
Approach Clearance Information, 4–8–6
Approach Clearance Procedures, 4–8–1
Approach Control Service for VFR Arriving Aircraft, 7–1–1
Approach Information (Arrivals), 4–7–4
Approach Lights, 3–4–2
Approach Separation Responsibility, 5–9–5
Approaches to Multiple Runways (Visual), 7–4–2
Arctic CTA, 8–10–1
Arresting System Operations, 3–3–3
Arrival Information, 4–7–3
Arrival Information by Approach Control Facilities, 4–7–5
[References are to page numbers]

Arrival Instructions (Radar), 5–9–2
Arrival Procedures, 4–7–1
Arrival Procedures and Separation (ATCT), 3–10–1
Arrivals on Parallel or Nonintersecting Diverging Runways (Radar), 5–8–3
ARTS, 5–15–1
ATC Assigned Airspace, 9–3–1
ATC Service, 2–1–1
ATIS Application, 2–9–1
ATIS Content, 2–9–2
ATIS Procedures, 2–9–1
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, 5–2–7
Automation – En Route, 5–14–1
Avoidance of Areas of Nuclear Radiation, 9–2–8
AWACS Special Flights, 9–2–9

B
Balloons, Unmanned Free, 9–6–1
Beacon Code for Pressure Suit Flights and Flights Above FL 600, 5–2–4
Beacon Code Monitor, 5–2–5
Beacon Identification Methods, 5–3–1
Beacon Range Accuracy, 5–1–2
Beacon Systems, 5–2–1
Beacon Target Displacement, 5–5–6
Beacon Termination, 5–2–8
Below Minima Report by Pilot, 4–7–4
Braking Action, 3–3–2
Braking Action Advisories, 3–3–2

C
Calm Wind Conditions, 2–6–4
Canadian Airspace Procedures, 12–1–1
Cancellation of Takeoff Clearance, 3–9–10
Caribbean ICAO Region, 8–8–1
Celestial Navigation Training, 9–2–1
Charted Visual Flight Procedures, 7–4–3
Circling Approach, 4–8–5
Class A Airspace Restrictions, 7–1–1
Class B Separation, 7–9–2
Class B Service Area (Terminal), 7–9–1
Class C Separation, 7–8–1
Class C Service (Terminal), 7–8–1
Clearance Beyond Fix, 4–6–2
Clearance Delivery Instructions, 4–2–1
Clearance for Visual Approach, 7–4–1
Clearance Information (Arrivals), 4–7–1
Clearance Items, 4–2–1
Clearance Items (Airfile), 4–2–3
Clearance Limit, 4–8–5
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, 4–3–5
Closed Runway Information, 3–3–1
Closed Traffic, 3–10–8
Coast Tracks, 5–14–2
Communications Failure, 10–4–1
Communications Release (Approaches), 4–8–6
Composite Separation Minima (Oceanic), 8–9–2
Computer Entry of Assigned Altitude, 5–14–2
Computer Message Verification, 2–2–2
Conflict Alert (Host), 5–14–1
Conflict Alert/Mode C Intruder (MCI) (ARTS), 5–15–2
Constraints Governing Supplements and Procedural Deviations, 1–1–2
Contact Approach, 7–4–3
References are to page numbers

Control Estimates, 8–1–1
Control Symbology (Strip), 2–3–12
Control Transfer, 2–1–7
Controller Initiated Coast Tracks, 5–14–2
Controller Pilot Data Link Communications (CPDLC), 2–4–4, 4–5–4, 13–2–3
Coordinate Use of Airspace, 2–1–7
Coordination Between Local and Ground Controllers, 3–1–2
Coordination with Receiving Facility (Departures), 4–3–6
Course Definitions, 1–2–2
Crossing Altitude, 4–1–2
CVFP, 7–4–3

Decision Support Tools, 13–1–1
Degree – Distance Route Definition for Military Operations, 4–4–2
Delay Sequencing (Departures), 4–3–6
Department of Energy Special Flights, 9–2–1
Departure and Arrival (Radar Separation), 5–8–3
Departure Clearances, 4–3–1
Departure Control Instructions (ATCT), 3–9–2
Departure Delay Information (ATCT), 3–9–1
Departure Information (ATCT), 3–9–1
Departure Procedures, 4–3–1
Departure Procedures and Separation (ATCT), 3–9–1
Departure Restrictions, 4–3–5
Departure Terminology, 4–3–1
Departures on Parallel or Nonintersecting Diverging Runways (Radar), 5–8–3
Deviation Advisories (Protected Airspace), 5–1–4
Discrete Environment (Beacon), 5–2–1
Disseminating Weather Information, 2–6–4
DOE, 9–2–1
Duty Priority, 2–1–1

E–MSAW, 5–14–1
Edge of Scope, 5–5–5
Electronic Attack (EA) Activity, 5–1–2
Electronic Cursor, 5–1–3
ELP Operations, 3–10–10
ELT, 10–2–3
Emergencies, 10–1–1
Emergencies Involving Military Fighter–Type Aircraft, 10–1–2
Emergency Airport Recommendation, 10–2–6
Emergency Assistance, 10–2–1
Emergency Code Assignment, 5–2–3
Emergency Control Actions, 10–4–1
Emergency Landing Pattern (ELP) Operations, 3–10–10
Emergency Lighting, 3–4–1
Emergency Locator Transmitter Signals, 10–2–3
Emergency Obstruction Video Map, 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, 5–14–1
En Route Sector Team Responsibilities, 2–10–1
Entry of Reported Altitude, 5–14–2
EOVM, 10–2–6
Equipment on Runways, 3–1–2
Establishing Two–Way Communications (Class D), 3–1–6
Evasive Action Maneuvers, 9–2–9
Expeditious Compliance, 2–1–3
Experimental Aircraft Operations, 9–2–2
Explosive Cargo, 10–5–1
Explosive Detection K–9 Teams, 10–2–5
[References are to page numbers]

F
FAA Research and Development Flights, 9–2–2
Facility Identification, 2–4–8
Failed Transponder in Class A Airspace, 5–2–6
Failure to Display Assigned Beacon Code, 5–2–5
False or Deceptive Communications, 2–4–1
Far Field Monitor (FFM) Remote Status Unit, 3–3–4
Final Approach Course Interception, 5–9–1
Final Approach Obstacle Clearance Surfaces (OCS), 3–7–5
Fix Use, 4–1–2
Flight Check Aircraft, 9–1–1
Flight Direction Exceptions, 4–5–1
Flight Plans and Control Information, 2–2–1
Flight Progress Strips, 2–3–1
FLYNET, 9–2–2
Formation Flight Additional Separation, 5–5–4
Formation Flights, 2–1–6
Forward Departure Delay Information, 4–3–6
Forwarding Amended and UTM Data, 2–2–3
Forwarding Approach Information by Nonapproach Control Facilities, 3–10–1
Forwarding Departure Times, 4–3–7
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
Fuel Dumping, 9–4–1
Function Code Assignments, 5–2–2

G
GPA 102/103 Correction Factor, 5–5–6
Ground Missile Emergencies, 10–7–1
Ground Operations, 3–7–4
Ground Operations When Volcanic Ash is Present, 3–1–6
Ground Stop, 4–3–6
Ground Traffic Movement, 3–7–1

H
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
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
HIWAS, 2–6–1
Hold for Release, 4–3–5
Holding Aircraft, 4–6–1
Holding Delays, 4–6–2
Holding Flight Path Deviation, 4–6–3
Holding Instructions, 4–6–3
Holding Pattern Surveillance, 5–1–4
Holding Points (Visual), 4–6–3

I
ICAO Phonetics, 2–4–5
IFR – VFR Flights, 4–2–3
IFR Flight Progress Data, 2–2–1
IFR to VFR Flight Plan Change, 2–2–1
ILS Protection/Critical Areas (Holding), 4–6–3
Inflight Deviations from Transponder/Mode C Requirements Between 10,000 Feet and 18,000 Feet, 5–2–8
Inflight Equipment Malfunctions, 2–1–4
Inhibiting Low Altitude Alert System (TPX–42), 5–16–1
Inhibiting Minimum Safe Altitude Warning (ARTS), 5–15–2
Initial Heading, 5–8–1
Inoperative Interrogator, 5–2–6
Inoperative/Malfunctioning Transponder, 5–2–5
Interceptor Operations, 9–2–4
Interfacility Automated Information Transfer, 5–4–5
Interphone Message Format, 2–4–3
Interphone Message Termination, 2–4–4
Interphone Transmission Priorities, 2–4–2
Intersecting Runway Separation (Arrival), 3–10–3
Intersecting Runway Separation (Departure), 3–9–7

J
Jettisoning of External Stores, 9–5–1

K
K–9 Teams, 10–2–5

L
LAAS, 5–16–1
Landing Area Condition, 3–3–1
Landing Clearance, 3–10–6
Landing Clearance Without Visual Observation, 3–10–7
Landing Information (ATCT), 3–10–1
Lateral Separation (Nonradar), 6–5–1
Lateral Separation (Oceanic), 8–4–1
Law Enforcement Operations by Civil and Military Organizations, 9–2–5
Light Signals (ATCT), 3–2–1
Line Up and Wait (LUAW), 3–9–2
Longitudinal Separation (Nonradar), 6–4–1
Longitudinal Separation (Oceanic), 8–3–1
Low Approach, 4–8–7
Low Level Wind Shear/Microburst Advisories, 3–1–3
Lowest Usable Flight Level, 4–5–2

M
Mach Number Technique, 8–3–2
Malfunctioning Interrogator, 5–2–6
MALS/ODALS, 3–4–2
Man–Portable Air Defense Systems (MANPADS) Alert, 10–2–5
Manual Input of Computer Assigned Beacon Codes, 2–2–2
Medium Intensity Runway Lights, 3–4–4
Merging Target Procedures, 5–1–3
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 Training Routes, 9–2–2
Minimum En Route Altitudes, 4–5–2
Minimum Fuel, 2–1–4
MIRL, 3–4–4
Missed Approach, 4–8–6
Missed Approach (Radar Approach), 5–10–4
Mixed Environment (Beacon), 5–2–1
Mode C Intruder Alert (Host), 5–14–1
Monitoring Radios, 2–4–1
MSAW, 5–15–2

N
NAVAID Fixes, 2–5–2
NAVAID Malfunctions, 2–1–5
NAVAID Terms, 2–5–1
NAVAID Use Limitations, 4–1–1
Navy Fleet Support Missions, 10–5–1
No–Gyro Approach, 5–10–2
Nondiscrete Environment (Beacon), 5–2–1
Nonradar, 6–1–1
Nonradar Initial Separation of Departing and Arriving Aircraft, 6–3–1
Nonradar Initial Separation of Successive Departing Aircraft, 6–2–1
Nonradar Timed Approaches, 6–7–1
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), 2–2–5
North Atlantic ICAO Region, 8–7–1
Notes, 1–2–2
Number Clarification, 2–4–7
Numbers Usage, 2–4–5

O
Observed Abnormalities, 3–1–5
Obstruction Lights, 3–4–5
Ocean21 ATC System, 13–2–1
Oceanic Coordination, 8–2–1
Oceanic Data Entries, 2–3–5
Oceanic Navigational Error Reporting (ONER) Procedures, 8–1–1
Oceanic Procedures, 8–1–1
Oceanic Separation, 8–1–1
Oceanic Transition Procedures, 8–5–1
Oceanic VFR Flight Plans, 8–1–1
Offshore Procedures, 8–1–1
Offshore Transition Procedures, 8–5–1
Open Skies Treaty Aircraft, 9–2–10
Operational Priority, 2–1–2
Operational Requests, 2–1–9
Overdue Aircraft, 10–3–1
Overhead Maneuver, 3–10–8

P
Pacific ICAO Region, 8–9–1
PAR Approaches – Terminal, 5–12–1
Parachute Operations, 9–7–1
Parallel Dependent ILS/MLS Approaches, 5–9–7
Passing or Diverging, 5–5–4
Personnel on Runways, 3–1–2
Pilot Acknowledgment/Read Back, 2–4–1
PIREP Information, 2–6–1
Point Out, 5–4–4

Position Determination (Airports), 3–1–2
Position Information (Radar), 5–3–2
Position Report (Oceanic), 8–1–1
Position Reporting (Radar), 5–1–4
Position Responsibilities, 2–10–1
Practice Approaches, 4–8–6
Practice Precautionary Approaches, 3–10–10
Prearranged Coordination, 5–4–5
Precision Approach Critical Area, 3–7–4
Precision Approach Path Indicators (PAPI), 3–4–1
Precision Obstacle Free Zone (POFZ), 3–7–5
Preventive Control (Airports), 3–1–1
Primary Radar Identification Methods, 5–3–1
Priority Interruptions, 2–4–2
Procedural Letters of Agreement, 1–1–2
Procedural Preference, 2–1–1

Q
Questionable Identification, 5–3–2

R
Radar Approaches – Terminal, 5–10–1
Radar Arrivals, 5–9–1
Radar Beacon Changes for Military Aircraft, 4–7–2
Radar Beacon Code Changes, 5–2–2
Radar Departures, 5–8–1
Radar Fix Posting, 5–1–4
Radar Identification, 5–3–1
Radar Identification Status, 5–3–2
Radar Presentation and Equipment Performance, 5–1–1
Radar Separation, 5–5–1
Radar Separation Application, 5–5–1
Radar Separation Minima, 5–5–2
Radar Separation Vertical Application, 5–5–3
Radar Service Limitations, 5–1–3
Radar Service Termination, 5–1–4
[References are to page numbers]

Radar Use, 5–1–1
Radar–Only Mode, 3–6–2
Radio and Interphone Communications, 2–4–1
Radio Communications, 2–1–7, 2–4–1
Radio Failure (Beacon), 5–2–3
Radio Frequency Changes for Military Aircraft, 4–7–2
Radio Message Format, 2–4–2
Receiver–Only Acknowledgment (ATCT), 3–2–1
Receiving Controller Handoff, 5–4–3
Recording Information, 2–2–1
Reduced Vertical Separation Minimum (RVSM), 2–1–12
Reduction of Route Protected Airspace (Oceanic), 8–4–3
References, 1–2–3
REIL, 3–4–1
Relayed Approach Clearance, 4–8–5
Release Times, 4–3–5
Reporting Essential Flight Information, 2–1–4
Reporting Weather Conditions, 2–6–4
Responsibility Transfer to RCC, 10–3–2
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
Routes in Class G Airspace, 4–4–3
Runway Centerline Lights, 3–4–4
Runway Edge Lights, 3–4–3
Runway End Identifier Lights, 3–4–1
Runway Exiting, 3–10–7
Runway Proximity, 3–7–4
Runway Selection, 3–5–1
RVR/RVV, 2–8–1
RVSM, 2–1–12

S
Safety Alert, 2–1–3
Safety Management System (SMS), 1–1–2
Same Runway Separation (Arrival), 3–10–2
Same Runway Separation (Departure), 3–9–4
SAR, 10–3–1
SAR Information to be Forwarded to ARTCC, 10–3–1
SAR Information to be Forwarded to RCC, 10–3–1
Sea Lane Operations, 3–12–1
Search and Rescue, 10–3–1
Sector Eligibility, 5–14–2
Security Notice (SECNOT), 9–2–5
Selected Altitude Limits, 5–14–2
Separation from Airspace Reservations, 8–6–1
Separation from Obstructions, 5–5–5
Sequence/Spacing Application, 3–8–1
Sequenced Flashing Lights, 3–4–2
SFA, 4–7–1
Side–Step Maneuver, 4–8–6
Simulated Flameout (SFO) Approaches, 3–10–10
Simultaneous Approach and Runway Edge Light Operation, 3–4–4
Simultaneous Departures (Radar), 5–8–1
Simultaneous Independent Dual ILS/MLS Approaches – High Update Radar, 5–9–9
Simultaneous Independent ILS/MLS Approaches – Dual & Triple, 5–9–8
Simultaneous Landings or Takeoffs (Helicopter), 3–11–3
Simultaneous Offset Instrument Approaches (SOIA)– High Update Radar, 5–9–11
Simultaneous Opposite Direction Operation, 3–8–2
Simultaneous Same Direction Operation, 3–8–1
Single Frequency Approaches, 4–7–1
Spacing and Sequencing (ATCT), 3–8–1
Special Flights, 9–1–1
Special Interest Sites, 9–2–4
Special Operations, 9–2–1
Special Use Airspace, 9–3–1

Index
[References are to page numbers]

Special VFR, 7–5–1
Specifying Altitude (Approaches), 4–8–5
Speed Adjustment, 5–7–1
Speed Adjustment Minima, 5–7–3
Speed Adjustment Termination, 5–7–3
Standby or Low Sensitivity Operation, 5–2–5
STOL Runways, 3–5–1
Stop–and–Go Low Approach, 3–8–1
Successive Departures (Radar), 5–8–1
Surface Area Restrictions, 3–1–5
Surface Areas, 2–1–7
Surveillance Approaches – Terminal, 5–11–1
SVFR, 7–5–1
Switching ILS/MLS Runways, 4–7–6

T
Tailwind Components, 3–5–1
Takeoff Clearance, 3–9–9
Target Markers, 5–3–3
Target Resolution, 5–5–1
Target Separation, 5–5–1
Taxi and Ground Movement Operations, 3–7–1
Taxi and Ground Movement Procedures, 3–7–1
Taxiway Lights, 3–4–5
Teletype Flight Data Format – U.S. ARTCCs –
Canadian ACCs, 2–2–4
Temporary Moving Airspace Reservations, 8–6–1
Temporary Stationary Airspace Reservations, 8–6–1
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
Terrain Awareness Warning System (TAWS) Alerts,
2–1–13
Through Clearances, 4–2–2

Timely Information (ATCT), 3–3–1
Touch–and–Go Approach, 4–8–7
Touch–and–Go Low Approach, 3–8–1
Touchdown Zone Lights, 3–4–4
Tower Team Position Responsibilities, 2–10–4
TPX–42 – Terminal, 5–16–1
Track Separation (Oceanic), 8–4–4
Track Suspend Function (ARTS), 5–15–2
Traffic Advisories, 2–1–9
Traffic Information (Airports), 3–1–2
Traffic Management Procedures, 11–1–1
Transfer of Jurisdiction, 4–7–4
Transfer of Position (SOP), Appendix D–1
Transfer of Radar Identification, 5–4–1
Transfer of Radar Identification – Methods, 5–4–1
Transfer of Radar Identification – Terms, 5–4–1
Transfer of Radar Identification – Traffic, 5–4–2
Transferring Controller Handoff, 5–4–2
Transmit Proposed Flight Plan, 2–2–3
TRSA, 7–7–1
TRSA Separation, 7–7–1

U
Unauthorized Laser Illumination of Aircraft, 2–9–2,
10–2–6
Unidentified Flying Object (UFO) Reports, 9–8–1
Unmanned Free Balloons, 9–6–1
Unmonitored NAVAIDs (Holding), 4–6–3
Unsafe Runway Information, 3–3–1
USAF/USN Undergraduate Pilots (Strips), 2–3–10
Use of Active Runways, 3–1–1
Use of MARSA, 2–1–5
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
[References are to page numbers]

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, 5–9–9
Vehicles on Runways, 3–1–2
Vertical Application Exceptions, 5–2–4
Vertical Separation (Nonradar), 6–6–1
Vertical Separation Minima, 4–5–1
VFR – IFR Flights, 4–2–3
VFR Aircraft in Weather Difficulty, 10–2–2
VFR Basic Radar Service (Terminal), 7–6–1
VFR Code Assignments, 5–2–3
VFR Conditions, 7–1–1
VFR Release of IFR Departure, 4–3–7
VFR-on-top, 7–3–1
VFR-on-top (NAVAID Use), 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 Separation, 7–2–1
Visual Signals (ATCT), 3–2–1
Visually Scanning Runways, 3–1–6
Volcanic Ash, 10–2–7

W

Wake Turbulence, 2–1–9
Wake Turbulence Cautionary Advisories, 2–1–9
Wake Turbulence Separation for Intersection Departures, 3–9–6
Warning Signal (ATCT), 3–2–1
Washington, DC, Special Flight Rules Area (DC SFRA), 9–2–4
Weather and Chaff Services, 2–6–2
Weather Deviations, 8–9–4
Weather Deviations in North Atlantic (NAT) Airspace, 8–7–2
Weather Familiarization, 2–6–1
Weather Information, 2–6–1
Weather Information (Arrivals), 4–7–3
Weather Reconnaissance Flights, 9–2–9
Withholding Landing Clearance, 3–10–7
Word Meanings, 1–2–1
Words and Phrases (Communications), 2–4–4
BRIEFING GUIDE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

Initiated By: AJV–0
Vice President, Mission Support Services
# Table of Contents

<table>
<thead>
<tr>
<th>Paragraph Number</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2–4–20</td>
<td>AIRCRAFT IDENTIFICATION</td>
<td>3</td>
</tr>
<tr>
<td>3–1–8</td>
<td>LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES</td>
<td>3</td>
</tr>
<tr>
<td>4–2–10</td>
<td>CANCELLATION OF IFR FLIGHT PLAN</td>
<td>5</td>
</tr>
<tr>
<td>10–2–19</td>
<td>REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT</td>
<td>6</td>
</tr>
</tbody>
</table>
1. PARAGRAPH NUMBER AND TITLE: 2-4-20. AIRCRAFT IDENTIFICATION

2. BACKGROUND: Several international military services, in addition to Canada, now have approved telephony identified in FAA Order JO 7340.2, Contractions.

3. CHANGE:

<table>
<thead>
<tr>
<th>OLD</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-4-20. AIRCRAFT IDENTIFICATION title thru b3</td>
<td>No Change</td>
</tr>
<tr>
<td>4. Foreign Military. Except Canada, the name of the country and the military service followed by the separate digits or letters of the registration or call sign. Canadian Forces aircraft shall be identified by the word “CANFORCE” followed by the separate digits of the serial number. The Canadian Coast Guard shall be identified as “Canadian Coast Guard” followed by the separate digits of the serial number.</td>
<td>4. Foreign Military. Except for military services identified in FAA Order JO 7340.2, Contractions, the name of the country and the military service followed by the separate digits or letters of the registration or call sign. For military services listed in FAA Order JO 7340.2, the approved telephony followed by the separate digits of the serial number.</td>
</tr>
</tbody>
</table>

1. PARAGRAPH NUMBER AND TITLE: 3–1–8. LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES

2. BACKGROUND: A communication disconnect exists between the air traffic control (ATC) and the aviation communities concerning actions a flight crew will make during a wind shear go around that has been initiated following in-cockpit windshear detection escape guidance. Flight crews are tasked with first escaping the wind shear event and then communicating/complying with ATC instructions. Unfortunately, ATC may not be aware that an aircrew is executing a "wind shear escape" procedure and the current directive does not identify this procedure.

3. CHANGE:

<table>
<thead>
<tr>
<th>OLD</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1-8. LOW LEVEL WIND SHEAR/MICROBURST ADVISORIES a thru b</td>
<td>No Change</td>
</tr>
<tr>
<td>1. At locations equipped with LLWAS, the local controller shall provide wind information as follows: NOTE through b2(d)</td>
<td>1. At locations equipped with LLWAS, the local controller must provide wind information as follows: No Change</td>
</tr>
</tbody>
</table>
The LLWAS NE++ and LLWAS-RS are designed to operate with as many as 50 percent of the total sensors inoperative. When all three remote sensors designated for a specific runway arrival or departure wind display line are inoperative then the LLWAS NE++ and LLWAS-RS for that runway arrival/departure shall be considered out of service. When a specific runway arrival or departure wind display line is inoperative and wind shear/microburst activity is likely (e.g., frontal activity, convective storms, PIREPs), a statement shall be included on the ATIS, “WIND SHEAR AND MICROBURST INFORMATION FOR RUNWAY (runway number) ARRIVAL/DEPARTURE NOT AVAILABLE.”

NOTE -

Add
c. Wind Shear Escape Procedures.

1. If an aircraft under your control informs you that it is performing a wind shear escape, do not issue control instructions that are contrary to pilot actions. ATC should continue to provide safety alerts regarding terrain or obstacles and traffic advisories for the escape aircraft, as appropriate.

EXAMPLE -
“Denver Tower, United 1154, wind shear escape.”

NOTE -
Aircraft that execute a wind shear escape maneuver will usually conduct a full power climb straight ahead and will not accept any control instructions until onboard systems advise the crew or the pilot in command (PIC) advises ATC that the escape maneuver is no longer required.

REFERENCE -
P/CG Term – Wind Shear Escape

2. Unless advised by additional aircraft that they are also performing an escape procedure, do not presume that other aircraft in the proximity of the escape aircraft are responding to wind shear alerts/events as well. Continue to provide control instructions, safety alerts, and traffic advisories as appropriate.

3. Once the responding aircraft has initiated a wind shear escape maneuver, the controller is not responsible for providing standard separation between the aircraft that is responding to an escape and any other aircraft, airspace, terrain, or obstacle. Responsibility for separation resumes when one of the following conditions are met:
Add (a) Departures:

(1) A crew member informs ATC that the wind shear escape maneuver is complete and ATC observes that standard separation has been re-established, or

(2) A crew member informs ATC that the escape maneuver is complete and has resumed a previously assigned departure clearance/routing.

Add (b) Arrivals:

(1) A crew member informs ATC that the escape maneuver is complete, and

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

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

Add EXAMPLE—

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

Or

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

1. PARAGRAPH NUMBER AND TITLE: 4–2–10. CANCELLATION OF IFR FLIGHT PLAN

2. BACKGROUND: Numerous airports within the National Airspace System are uncontrolled and many of those that have an air traffic control (ATC) tower are only operational on a part-time basis. The Aeronautical Information Manual advises pilots operating under Instrument Flight Rules (IFR) arriving at uncontrolled airports, and are unable to cancel their IFR flight plan with a functioning Flight Service Station, they must cancel this service with ATC while airborne or on the ground after landing. Once cancellation is received, the affected airspace may then be released for IFR use by additional aircraft.

ATC facilities use this procedure regularly, but there is no official phraseology specified in FAA Order JO 7110.65 for controller use when requesting pilots to report IFR cancellation or how to properly acknowledge the receipt of an IFR cancellation. Controller opinions and facility procedures vary on what is considered a proper advisory and appropriate acknowledgement. A universal response for both situations, using prescribed phraseology in Chapter 4 of the FAA Order JO 7110.65, would eliminate the confusion of this procedure and enhance pilot confidence of an ATC acknowledgement.

3. CHANGE:

OLD

Add

NEW

4-2-10. CANCELLATION OF IFR FLIGHT PLAN
a. If necessary, before instructing an IFR aircraft arriving at an airport not served by an air traffic control tower or flight service station to change to the common traffic advisory frequency, provide the pilot with instructions on how to cancel his/her IFR flight plan.

1. Airports with an air/ground communications station:

PHRASEOLOGY-
(Call sign) REPORT CANCELLATION OF IFR ON (frequency).

2. Airports without an air/ground communications station:

PHRASEOLOGY-
(Call sign) REPORT CANCELLATION OF IFR THIS FREQUENCY OR WITH FLIGHT SERVICE.
Or

(Aircraft call sign) REPORT CANCELLATION OF IFR THIS FREQUENCY OR WITH (FSS serving the area or the ATC controlling facility).

EXAMPLE-
“N13WA report cancellation of IFR this frequency or with McAlester Radio.”

b. Respond to a pilot’s cancellation of his/her IFR flight plan as follows:

PHRASEOLOGY-
(Call sign) IFR CANCELLATION RECEIVED.

1. PARAGRAPH NUMBER AND TITLE: 10-2-19. REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT

2. BACKGROUND: The International Civil Aviation Organization (ICAO) standard calls for pilots in command to ensure reporting of in-flight cases of suspected communicable disease to air traffic control (ATC). ATC is then expected to relay this notification to the appropriate public health or other competent authority. The Centers for Disease Control and Prevention (CDC) has requested FAA assistance in implementing this notification protocol, which will also be used for deaths and other public health risks on board aircraft. The new emphasis on this notification routing through ATC is intended to expedite alerting and better support shared situational awareness among the key stakeholders, reinforcing efforts to slow the spread of dangerous diseases and other public health risks by air travel, while enabling ATC to better mitigate impacts caused by actions necessary to facilitate public health intervention (e.g., diversion of the affected flight) on the safety and efficiency of the aviation system.

3. CHANGE:

OLD
Add

NEW
Add

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 a person, an illness, and/or other public health risk obtain the following information and notify the operations manager in charge (OMIC)/front line manager (FLM)/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/FLM/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) 493-4170.

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 O JO 7210.3, Para 2-1-29, REPORTING DEATH, ILLNESS, OR OTHER PUBLIC HEALTH RISK ON BOARD AIRCRAFT