

**DOCKET NO.: SA-517
EXHIBIT NO. 3-I**

**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.**

**EXCERPTS FROM FAA ORDER 7110.65
AIR TRAFFIC CONTROL**

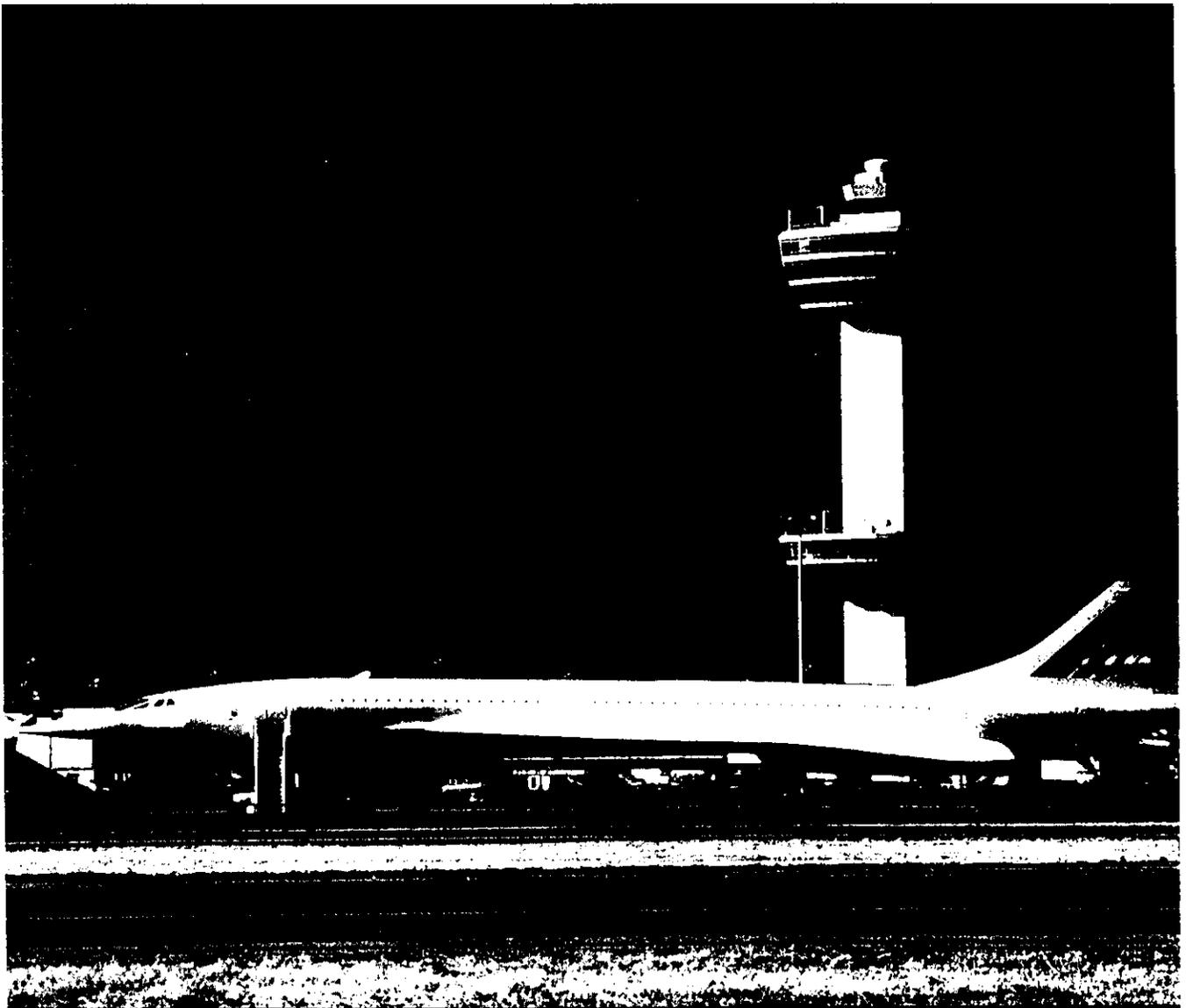
(27 pages)



U.S. Department
of Transportation
**Federal Aviation
Administration**

7110.65J

Air Traffic Control



Distribution:

July 20, 1995

*Prepared by the Air Traffic Rules
and Procedures Service*

I-1

AIR TRAFFIC CONTROL
7110.65J
FOREWORD

This order prescribes air traffic control procedures and phraseology for use by personnel 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 not covered by it.



Bill F. Jeffers
Director of Air Traffic

Reconnaissance Squadron (53WRS) operations center personnel, or in the remarks section of the flight plan.

REFERENCE-

FAAO 7110.65, WEATHER RECONNAISSANCE FLIGHTS, Para 9-3-17.

m. IFR aircraft shall have priority over SVFR aircraft.

REFERENCE-

FAAO 7110.65, Chapter 7, Section 5. - Special VFR.

n. Provide priority and special handling to expedite the movement of OPEN SKIES Observation and Demonstration flights.

NOTE-

An Open Skies aircraft has priority over all "regular" air traffic. "Regular" is defined as all aircraft traffic other than:

1. Emergencies.
2. Aircraft directly involved in Presidential movement.
3. Forces or activities in actual combat.
4. Lifeguard, MED EVAC, AIR EVAC and active SAR missions.

REFERENCE-

FAAO 7110.65 OPEN SKIES TREATY AIRCRAFT, para 9-3-19
FAAO 7210.3, OPEN SKIES TREATY AIRCRAFT, para 6-3-7
TREATY ON OPEN SKIES, TREATY DOCUMENT, 102-37.

2-1-5. EXPEDITIOUS COMPLIANCE

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

b. Use the word "expedite" only when prompt compliance is required to avoid the development of an imminent situation.

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

2-1-6. SAFETY ALERT

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

NOTE-

☐ The issuance of a safety alert is a first priority (see para. 2-1-2) once the controller observes and recognizes a situation of unsafe aircraft proximity to terrain,

obstacles, or other aircraft. Conditions, such as workload, traffic volume, the quality / limitations of the radar system, and the available lead time to react are factors in determining whether it is reasonable for the controller to observe and recognize such situations. While a controller cannot see immediately the development of every situation where a safety alert must be issued, the controller must remain vigilant for such situations and issue a safety alert when the situation is recognized.

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

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

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

PHRASEOLOGY-

(Identification) **LOW ALTITUDE ALERT,**

CHECK YOUR ALTITUDE IMMEDIATELY.

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

*or if an aircraft is past the final approach fix
(nonprecision approach),*

or the outer marker,

or the fix used in lieu of the outer marker (precision approach),

and , if known, issue

THE, as appropriate, MDA / DH IS (altitude).

b. Aircraft Conflict / Mode C Intruder Alert- Immediately issue / initiate an alert to an aircraft if you are aware of another aircraft at an altitude which you believe places them in unsafe proximity. If feasible, offer the pilot an alternate course of action.

c. When an alternate course of action is given, end the transmission with the word "immediately."

PHRASEOLOGY-

(identification) **TRAFFIC ALERT (position of traffic if time permits),**

ADVISE YOU TURN LEFT / RIGHT (specific heading, if appropriate),

and / or

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

REFERENCE-

FAAO 7110.65, **CONFLICT MODE C INTRUDER ALERT**, Para 5-14-1.
FAAO 7110.65, **EN ROUTE MINIMUM SAFE ALTITUDE WARNING**
(E-MSAW), Para 5-14-2.
FAAO 7110.65, **CONFLICT ALERT**, Para 5-15-6
FAAO 7110.65, **ALTITUDE FILTERS**, Para 5-2-24.

2-1-7. INFLIGHT EQUIPMENT MALFUNCTIONS

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

NOTE-

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

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

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

2-1-8. MINIMUM FUEL

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

NOTE-

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

2-1-9. REPORTING ESSENTIAL FLIGHT INFORMATION

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

NOTE-

FSSs are responsible for classifying and disseminating Notices to Airmen.

REFERENCE-

FAAO 7110.65, **TIMELY INFORMATION**, Para 3-3-3.
FAAO 7110.65, **SERVICE LIMITATIONS**, Para 5-1-6.
FAAO 7210.3, **PERIODIC MAINTENANCE**, Para 3-2.
USN, SEE OPNAVINST 3721.30.

2-1-10. NAVAID MALFUNCTIONS

When an aircraft reports a NAVAID malfunction, take the following actions:

NOTE-

The sequence of the actions stated in this paragraph, are not intended to circumvent good judgment should the circumstances so dictate.

REFERENCE-

FAAO 7210.3, **SYSTEM COMPONENT MALFUNCTIONS**, Para 3-51.

a. Request a report from a second aircraft.

b. If the second aircraft reports normal operations, continue use and inform the first aircraft. Record the incident on FAA Form 7230-4 or appropriate Military Form.

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

d. If normal operation is reported after the standby equipment is activated, continue use, record the incident on FAA Form 7230-4 or appropriate Military Form, and notify Airway Facilities (AF) personnel (the Systems Engineer of the ARTCC when an en route aid is involved).

e. If continued malfunction is reported after the standby equipment is activated or the standby equipment cannot be activated, inform AF personnel and request advice on whether or not the aid should be shut down. In the absence of a second aircraft report, advise the AF personnel of the time of the initial aircraft report and the estimated time a second aircraft report could be obtained.

I-4
General

Section 4. RADIO AND INTERPHONE COMMUNICATIONS

2-4-1. RADIO COMMUNICATIONS

Use radio frequencies for the special purposes for which they are intended. A single frequency may be used for more than one function except as follows:

TERMINAL: When combining positions in the tower, do not use ground control frequency for airborne communications.

NOTE-

Due to the limited number of frequencies assigned to towers for the ground control function, it is very likely that airborne use of a ground control frequency could cause interference to other towers or interference to your aircraft from another tower. When combining these functions, it is recommended combining them on local control. The ATIS may be used to specify the desired frequency.

2-4-2. MONITORING

Monitor interphones and assigned radio frequencies continuously.

NOTE-

Although all FAA facilities, including RAPCON's and RATCF's, are required to monitor all assigned frequencies continuously, USAF facilities may not monitor all unpublished discrete frequencies.

2-4-3. PILOT ACKNOWLEDGMENT / READBACK

a. When issuing clearances or instructions ensure acknowledgment by the pilot.

NOTE-

Pilots may acknowledge clearances, instructions, or other information by using "Wilco," "Roger," "Affirmative," or other words or remarks.

REFERENCE-

AIM, CONTACT PROCEDURES, Para 4-2-3.

b. If altitude, heading, or other items are read back by the pilot, ensure the readback is correct. If incorrect or incomplete, make corrections as appropriate.

2-4-4. AUTHORIZED INTERRUPTIONS

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

NOTE-

Some users have adopted procedures to insure uninterrupted receiving capability with ATC when a pilot with only one operative communications radio must interrupt his communications guard because of a safety

related problem requiring airborne communications with his company. In this event, pilots will request approval to abandon guard on the assigned ATC frequency for a mutually agreeable time period. Additionally, they will inform controllers of the navaid voice facility and the company frequency they will monitor.

2-4-5. AUTHORIZED TRANSMISSIONS

Transmit only those messages necessary for air traffic control or otherwise contributing to air safety.

REFERENCE-

FAAO 7210.3, AUTHORIZED MESSAGES NOT DIRECTLY ASSOCIATED WITH AT SERVICES, Para 3-21.

2-4-6. FALSE OR DECEPTIVE COMMUNICATIONS

Take action to detect, prevent, and report:

a. False, deceptive, or phantom controller communications to an aircraft or controller. The following shall be accomplished when false or deceptive communications occur:

1. Correct false information.
2. Broadcast an alert to aircraft operating on all frequencies within the area where deceptive or phantom transmissions have been received.

EXAMPLE-

"Attention all aircraft. False air traffic control instructions have been received in the area of Long Beach Airport. Exercise extreme caution on all frequencies and verify instructions."

3. Collect pertinent information regarding the incident.

4. Notify the Area Supervisor of the false, deceptive, or phantom transmission and report all relevant information pertaining to the incident.

2-4-7. AUTHORIZED RELAYS

a. Relay operational information to aircraft or aircraft operators as necessary. Do not agree to handle such messages on a regular basis. Give the source of any such message you relay.

b. Relay official FAA messages as required.

NOTE-

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

Administrator- "SAFEAIR ONE."

Deputy Administrator- "SAFEAIR TWO."

Section 6. WEATHER INFORMATION

2-6-1. FAMILIARIZATION

Become familiar with pertinent weather information when coming on duty, and stay aware of current weather information needed to perform air traffic control duties.

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

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

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

NOTE-

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

PHRASEOLOGY-

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

b. Controllers outside of commissioned HIWAS areas shall:

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

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

PHRASEOLOGY-

ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION FOR (geographical area) AVAILABLE FROM FLIGHT WATCH OR FLIGHT SERVICE.

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

REFERENCE-

AIM, Para 7-5 THROUGH Para 7-9.

2-6-3. PIREP INFORMATION

Significant PIREP information includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, windshear and turbulence (including clear air turbulence) of moderate or greater intensity, volcanic eruptions and volcanic ash clouds, and other conditions pertinent to flight safety.

REFERENCE-

FAAO 7110.65, LOW LEVEL WINDSHEAR ADVISORIES, Para 3-1-8. FAAO 7210.3, HANDLING OF SIGMET'S, CWA'S, AND PIREP'S, Para 8-30. AIM, FLIGHT OPERATIONS IN VOLCANIC ASH, Para 7-86. FAAO 7210.3, SIGMET AND PIREP HANDLING, Para 12-30.

a. Solicit PIREPs when requested or when one of the following conditions exists or is forecast for your area of jurisdiction:

1. Ceilings at or below 5,000 feet. These PIREPs shall include cloud base/top reports when feasible. **TERMINAL:** Ensure that at least one descent/climb-out PIREP, including cloud base/s, top/s, and other related phenomena, is obtained each hour.

ENROUTE: When providing approach control services, the requirements stated in **TERMINAL** above apply.

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

3. Thunderstorms and related phenomena.

4. Turbulence of moderate degree or greater.

5. Icing of light degree or greater.

6. Windshear.

7. Volcanic ash clouds

NOTE-

Pilots may forward PIREPs regarding volcanic activity using the format described in the Volcanic Activity

Reporting Form (VAR) as depicted in the AIM, Appendix 2.

8. TERMINAL: Braking Action Advisories are in effect.

REFERENCE-
FAAO 7110.65, BRAKING ACTION ADVISORIES, Para 3-3-5.
PICG TERM- BRAKING ACTION ADVISORIES.

b. Record with the PIREP's:

1. Time.
2. Aircraft position.
3. Type aircraft.
4. Altitude.
5. When the PIREP involves icing include:

- (a) Icing type and intensity.
- (b) Air temperature in which icing is occurring.

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

PHRASEOLOGY-
REQUEST FLIGHT CONDITIONS.

or if appropriate,

REQUEST (specific conditions; ie., ride, ceiling, visibility, etc.) **CONDITIONS.**

if necessary,

OVER (fix),

or

ALONG PRESENT ROUTE,

or

BETWEEN (fix) and (fix).

d. Handle PIREPs as follows:

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

2. **EN ROUTE:** Relay all operationally significant PIREP's to the facility weather coordinator.

3. **TERMINAL:** Relay all operationally significant PIREP's to:

- (a) The appropriate intrafacility positions.

(b) The FSS serving the area in which the report was obtained.

NOTE-
The FSS is responsible for long line dissemination.

(c) Other concerned terminal or en route ATC facilities, including non-FAA facilities.

(d) Use the word *gain* and/or *loss* when describing to pilots the effects of windshear on airspeed.

EXAMPLE-
"Delta Seven Twenty-One, A Boeing Seven

Twenty-Seven, previously reported windshear, loss of two five knots at four hundred feet."

"U.S. Air Seventy-Six, a D-C Niner, previously reported windshear, gain of twenty-five knots between niner hundred and six hundred feet, followed by a loss of five zero knots between five hundred feet and the surface."

REFERENCE-
AIM, WINDSHEAR PIREPS, Para 7-22.

2-6-4. WEATHER AND CHAFF SERVICES

a. Issue pertinent information on observed/reported weather or chaff areas. Provide radar navigational guidance and/or approve deviations around weather or chaff areas when requested by the pilot. Do not use the word "turbulence" in describing radar-derived weather.

1. Issue weather and chaff information by defining the area of coverage in terms of azimuth (by referring to the 12-hour clock) and distance from the aircraft or by indicating the general width of the area and the area of coverage in terms of fixes or distance and direction from fixes.

2. Issue the level of echo intensity when that information is derived from ASR-9 or NWS weather radar equipment. Controllers shall ensure that the highest available level of echo intensity within their area of jurisdiction is displayed.

3. When a deviation cannot be approved as requested and the situation permits, suggest an alternative course of action.

b. In areas of significant weather, plan ahead and be prepared to suggest, upon pilot request, the use of alternative routes/altitudes.

NOTE-
Weather significant to the safety of aircraft includes such conditions as tornadoes, lines of thunderstorms, embedded thunderstorms, large hail, windshear, moderate to extreme turbulence (including CAT), and light to severe icing.

c. Inform any tower for which you provide approach control services if you observe any weather echoes on radar which might affect their operations.

PHRASEOLOGY-

WEATHER/CHAFF AREA BETWEEN (number) O'CLOCK AND (number) O'CLOCK (number) MILES,

or

(number) MILE BAND OF WEATHER/CHAFF FROM (fix or number of miles and direction from fix) TO (fix or number of miles and direction from fix),

or

LEVEL (number) WEATHER ECHO BETWEEN (number) O'CLOCK AND (number) O'CLOCK, (number) MILES. MOVING (direction) AT (number) KNOTS, TOPS (altitude).

or

DEVIATION APPROVED, (restrictions if necessary), ADVISE WHEN ABLE TO:

RETURN TO COURSE,

or

RESUME OWN NAVIGATION

or

FLY HEADING (heading)

or

PROCEED DIRECT TO (name of NAVAID). UNABLE DEVIATION (state possible alternate course of action)

EXAMPLE-

① "Level five weather echo between eleven o'clock and one o'clock, one zero miles. Moving east at two zero knots, tops flight level three niner zero."

② "Level four weather echo between ten o'clock and two o'clock, one five miles. Weather area is two five miles in diameter."

NOTE-

Phraseology using level number is only applicable when the radar weather echo intensity information is determined by NWS radar equipment or ASR-9 radar equipment.

REFERENCE-

P/CG Term- Radar Weather Echo Intensity Levels

d. The area supervisor/ area manager/ controller-in-charge shall verify the ASR-9 weather channel information by the best means available (e.g., pilot reports, local tower personnel, etc.) if the weather data display by the ASR-9 is reported as questionable or erroneous. Errors in weather radar presentation shall

be reported to the AF technician and the AT supervisor shall determine if the weather channel is to be disabled and a NOTAM distributed.

NOTE-

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

2-6-5. CALM WIND CONDITIONS

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

REFERENCE-

FAAO 7110.65, TAILWIND COMPONENTS, Para 3-5-3.

FAAO 7110.65, INTERSECTING RUNWAY SEPARATION, Para 3-10-4.

2-6-6. REPORTING WEATHER CONDITIONS

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

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

2. Forward tower visibility observations to the weather observer.

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

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

1. When the official weather changes to a condition which is below 1,000-foot ceiling or below the highest circling minimum, whichever is greater, or less than 3 miles visibility, and when it improves to a condition which is better than those above.

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

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

d. If the receiving facility informs you that weather reports are not required for a specific time period, discontinue the reports. The time period specified should not exceed the duration of the receiving controller's tour of duty.

e. *EN ROUTE*: When you determine that weather reports for an airport will not be required for a specific time period, inform the FSS or tower of this determination. The time period specified should not exceed the duration of receiving controller's tour of duty.

REFERENCE-
FAAO 7110.65, FORWARDING APPROACH INFORMATION BY
NONAPPROACH CONTROL FACILITIES, Para 3-10-2.

2-6-7. DISSEMINATING WEATHER INFORMATION

TERMINAL: Observed elements of weather information shall be disseminated as follows:

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

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

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

NOTE-
USAF controllers do not serve as official weather observers.

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

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

4. The information is obtained from an official Automated Weather Observation System (AWOS) or an Automated Surface Observation System (ASOS).

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

Section 9. AUTOMATIC TERMINAL INFORMATION SERVICE PROCEDURES

2-9-1. APPLICATION

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

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

1. Each alphabet letter phonetic word shall be used sequentially, except as authorized in subpara a. 2. , beginning with "Alpha," ending with "Zulu," and repeated without regard to the beginning of a new day. Identify the first resumed broadcast message with "Alpha" or the first assigned alphabet letter word in the event of a broadcast interruption of more than 12 hours.

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

REFERENCE-

FAAO 7210.3, AUTOMATIC TERMINAL INFORMATION SERVICE (ATIS), Para 12-4-1.

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

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

2-9-2. OPERATING PROCEDURES

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

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

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

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

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

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

EXAMPLE-

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

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

d. Controllers shall ensure that pilots receive the most current pertinent information. Ask the pilot to confirm receipt of the current ATIS information if the pilot does not initially state the appropriate ATIS code. Controllers shall ensure that changes to pertinent operational information is provided after the initial confirmation of ATIS information is established. Issue the current weather, runway in use, approach information, and pertinent NOTAMs to pilots who are unable to receive the ATIS.

EXAMPLE-

"Verify you have information ALPHA."

"Information BRAVO now current, visibility three miles."

"Information CHARLIE now current, Measured Ceiling 1500 Broken."

2-9-3. CONTENT

Include the following in ATIS broadcast as appropriate:

a. Facility name, phonetic letter code, time of weather sequence (UTC). Weather information consisting of ceiling, visibility, obstructions to vision, temperature, dew point, wind direction and velocity, altimeter, a density altitude advisory when appropriate, and other pertinent remarks included in the official weather observation. Wind direction, velocity, and altimeter shall be reported from certified direct reading instruments. Temperature and dew point should be reported from certified direct reading sensors when available. Always include weather observation remarks of lightening, cumulonimbus, and towering cumulus clouds.

NOTE-

The geographic situation display (GSD) is a supervisory planning tool and is not intended to be a primary tool for microburst or windshear alerts.

3-1-9. USE OF TOWER RADAR DISPLAYS

a. 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 FAAO 7110.65, Para 7-2-1, apply unless otherwise authorized by AAT-1.

REFERENCE-

FAAO 7110.65, PRIMARY RADAR IDENTIFICATION METHODS, Para 5-3-2.
FAAO 7110.65, BEACON IDENTIFICATION METHODS, Para 5-3-3.
FAAO 7110.65, ARTS / PIDP IDENTIFICATION METHODS, Para 5-3-4.

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 FAAO 7110.65, APPLICATION, Para 5-3-1 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."

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

REFERENCE-

FAAO 7110.65, MINIMA, Para 5-5-3.

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-

FAR Part 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 7110.65, SURFACE AREAS, Para 2-1-16.

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 (LOA), and the activity will have no adverse affect on safety of the air traffic operation or result in a reduction of service to other users.

Section 10. ARRIVAL PROCEDURES AND SEPARATION

3-10-1. LANDING INFORMATION

Provide current landing information, as appropriate, to arriving aircraft. Landing information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code. Runway, wind, and altimeter may be omitted if a pilot uses the phrase "have numbers." Issue landing information by including the following:

NOTE-

Pilot use of "have numbers" does not indicate receipt of the ATIS broadcast.

a. Specific traffic pattern information (may be omitted if the aircraft is to circle the airport to the left).

PHRASEOLOGY-

ENTER LEFT / RIGHT BASE

STRAIGHT-IN.

MAKE STRAIGHT-IN.

STRAIGHT-IN APPROVED.

RIGHT TRAFFIC.

MAKE RIGHT TRAFFIC.

RIGHT TRAFFIC APPROVED. CONTINUE.

b. Runway in use.

c. Surface wind

d. Altimeter setting.

REFERENCE-

FAAO 7110.65, CURRENT SETTINGS, Para 2-7-1.

e. Any supplementary information

f. Clearance to land.

g. Requests for additional position reports. Use prominent geographical fixes which can be easily recognized from the air, preferably those depicted on sectional charts. This does not preclude the use of the legs of the traffic pattern as reporting points.

NOTE-

At some locations, VFR checkpoints are depicted on Sectional Aeronautical and Terminal area charts. In selecting geographical fixes, depicted VFR checkpoints are preferred unless the pilot exhibits a familiarity with the local area.

h. Ceiling and visibility if either is below basic VFR minima.

i. Low level windshear advisories when available.

REFERENCE-

FAAO 7110.65, LOW LEVEL WINDSHEAR ADVISORIES, Para 3-1-8.

j. 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 7110.65, BRAKING ACTION ADVISORIES, Para 3-3-5.

3-10-2. FORWARDING APPROACH INFORMATION BY NONAPPROACH CONTROL FACILITIES

a. Forward the following, as appropriate, to the control facility having IFR jurisdiction in your area. You may eliminate those items that, because of local conditions or situations, are fully covered in a letter of agreement or a facility directive.

1. When you clear an arriving aircraft for a visual approach.

REFERENCE-

FAAO 7110.65, VISUAL APPROACH, Para 7-4-1.

2. Aircraft arriving time.

3. Cancellation of IFR flight plan.

4. Information on a missed approach, unreported, or overdue aircraft.

5. Runway in use.

6. Weather as required.

REFERENCE-

FAAO 7110.65, REPORTING WEATHER CONDITIONS, Para 2-6-6.

b. When the weather is below 1,000 feet or 3 miles or the highest circling minimums, whichever is greater, issue current weather to aircraft executing an instrument approach if it changes from that on the ATIS or that previously forwarded to the center/approach control.

3-10-3. SAME RUNWAY SEPARATION

a. Separate an arriving aircraft from another aircraft using the same runway by ensuring that the arriving aircraft does not cross the landing threshold until one of the following conditions exists or unless authorized in para 3-10-10.

1. The other aircraft has landed and is clear of the runway. Between sunrise and sunset, if you can determine distances by reference to suitable landmarks and the other aircraft has landed, it need not be clear of

aircraft which is using or is planning to use another runway.

PHRASEOLOGY-

WIND (surface wind direction and velocity), CLEARED TO LAND,

or

WIND (surface wind direction and velocity), RUNWAY (designator) CLEARED TO LAND.

NOTE-

A clearance to land means that appropriate separation on the landing runway will be ensured. A landing clearance does not relieve the pilot from compliance with any previously issued restriction.

3-10-6. ANTICIPATING SEPARATION

Landing clearance to a succeeding aircraft in a landing sequence need not be withheld if you observe the positions of the aircraft and determine that prescribed runway separation will exist when the aircraft cross the landing threshold. Issue traffic information to the succeeding aircraft if not previously reported.

EXAMPLE-

"Delta forty-two cleared to land. Traffic is U.S. Air MD-Eighty over approach lights."

REFERENCE-

FAAO 7110.65, CLOSED / UNSAFE RUNWAY INFORMATION, Para 3-3-2.

3-10-7. LANDING CLEARANCE WITHOUT VISUAL OBSERVATION

When an arriving aircraft reports at a position where he should be seen but has not been visually observed, advise the aircraft as a part of the landing clearance that it is not in sight and restate the landing runway.

PHRASEOLOGY-

NOT IN SIGHT, RUNWAY (number) CLEARED TO LAND.

NOTE-

Aircraft observance on the BRITE / DBRITE radar display satisfies the visually observed requirement.

3-10-8. WITHHOLDING LANDING CLEARANCE

Do not withhold a landing clearance indefinitely even though it appears a violation of Title 14 of the Code of Federal Regulations has been committed. The apparent violation might be the result of an emergency situation. In any event, assist the pilot to the extent possible.

3-10-9. RUNWAY EXITING

a. Instruct aircraft where to turn-off the runway after landing, when appropriate, and advise the aircraft to hold short of a runway or taxiway if required for traffic.

PHRASEOLOGY-

TURN LEFT / RIGHT (turning point),

or

IF ABLE, TURN LEFT/RIGHT (TURNING POINT)

and if required

HOLD SHORT OF (runway).

NOTE-

Runway exiting or taxi instructions should not normally be issued to an aircraft prior to, or immediately after, touchdown.

b. Taxi instructions shall be provided to the aircraft by the local controller when:

1. Compliance with air traffic control (ATC) instructions will be required before the aircraft can change to ground control, or

2. The aircraft will be required to enter a taxiway/runway/ramp area, other than the one used to exit the landing runway, in order to taxi clear of the landing runway.

EXAMPLE-

U.S. Air Ten Forty Two, turn right next taxiway, cross taxiway Bravo, hold short of taxiway Charlie, contact ground point seven.

NOTE-

☐ *An aircraft is expected to taxi clear of the runway unless otherwise directed by ATC. In the absence of ATC instructions, an aircraft should taxi clear of the landing runway even if that requires the aircraft to protrude into or enter another taxiway / runway / ramp area. This does not authorize an aircraft to cross a subsequent taxiway / runway / ramp after clearing the landing runway.*

☑ *The pilot is responsible for ascertaining when the aircraft is clear of the runway.*

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

REFERENCE-

FAAO 7210.3, USE OF ACTIVE RUNWAYS, Para 12-7.

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

adequate for approach / landing is the responsibility of the pilot / aircraft operator.

- a. Issue appropriate instructions to the aircraft to hold or proceed to another airport.
- b. Adjust, as necessary, the position in the landing sequence of any other aircraft desiring to make approaches and issue approach clearances accordingly.

4-7-10. TRANSFER OF JURISDICTION

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

4-7-11. APPROACH INFORMATION

a. Both en route and terminal approach control sectors shall provide current approach information to aircraft destined to airports for which they provide approach control services. This information shall be provided on initial contact or as soon as possible thereafter. Approach information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code; otherwise, issue approach information by including the following:

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

*REFERENCE-
FAAO 7110.65, ADVANCE APPROACH INFORMATION, Para 4-7-6.*

2. Runway if different from that to which the instrument approach is made.
3. Surface wind.
4. Ceiling and visibility if the ceiling at the airport of intended landing is reported below 1,000 feet or below the highest circling minimum, whichever is greater, or the visibility is less than 3 miles.
5. Altimeter setting for the airport of intended landing.

*REFERENCE-
FAAO 7110.65, CHAPTER 2, SECTION 7, ALTIMETER SETTINGS.*

b. Controllers without access to current airport weather data or upon pilot request shall inform pilots of the frequency where automated weather data may be obtained and, if appropriate, that airport weather is not available.

PHRASEOLOGY-

(airport) AWOS/ASOS WEATHER AVAILABLE ON (frequency).

NOTE-

Automated weather observing systems may be set to provide one minute updates. This one minute data may be useful to the pilot for possible weather trends. Controllers provide service based solely on official weather, i.e. hourly and special observations.

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

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

EXAMPLE-

"Expect visual approach runway two five right, runway two five right I-L-S not operational."

REFERENCE-

*FAAO 7110.65, ALTIMETER SETTING ISSUANCE BELOW LOWEST USABLE FL, Para 2-7-2.
FAAO 7110.65, APPROACH INFORMATION, Para 5-10-2.
FAR PART 91.129(d)(2).*

4-7-12. ARRIVAL INFORMATION BY APPROACH CONTROL FACILITIES

TERMINAL

a. Forward the following information to nonapproach control towers soon enough to permit adjustment of the traffic flow or to FSS's soon enough to provide Local Airport Advisory where applicable:

1. Aircraft identification.
2. Type of aircraft.
3. ETA.
4. Type of instrument approach procedure the aircraft will execute; or
5. For SVFR, the direction from which the aircraft will enter Class B, Class C, Class D, or Class E surface area and any altitude restrictions that were issued; or
6. For aircraft executing a contact approach the position of the aircraft.

NOTE-

Specific time requirements are usually stated in a Letter of Agreement.

- b. Forward the following information to the tower when the tower and TRACON are part of the same facility:

I-14

Section 8. APPROACH CLEARANCE PROCEDURES

4-8-1. APPROACH CLEARANCE

a. Clear aircraft for "standard" or "special" instrument approach procedures only. To require an aircraft to execute a particular instrument approach procedure, specify in the approach clearance the name of the approach as published on the approach chart. Where more than one procedure is published on a single chart and a specific procedure is to be flown, amend the approach clearance to specify execution of the specific approach to be flown. If only one instrument approach of a particular type is published, the approach need not be identified by the runway reference. An aircraft conducting an ILS / MLS approach when the glideslope / glidepath is reported out of service shall be advised at the time an approach clearance is issued. Standard Instrument Approach Procedures shall commence at an Initial Approach Fix or an Intermediate Approach Fix if there is not an Initial Approach Fix. Where adequate radar coverage exists, radar facilities may vector aircraft to the final approach course in accordance with FAAO 7110.65, paragraph 5-9-1.

PHRASEOLOGY-

CLEARED (type) APPROACH.

(for a straight-in-approach- IFR),

CLEARED STRAIGHT-IN (type) APPROACH.

(to authorize a pilot to execute his choice of instrument approach),

CLEARED APPROACH.

(where more than one procedure is published on a single chart and a specific procedure is to be flown),

CLEARED (specific procedure to be flown) APPROACH.

(to authorize a pilot to execute an ils / mls approach when the glideslope / glidepath is out of service),

CLEARED (type) APPROACH, GLIDESLOPE / GLIDEPATH UNUSABLE.

EXAMPLE-

"Cleared approach."

"Cleared V-O-R approach."

"Cleared V-O-R runway Three Six Approach."

"Cleared F-M-S Approach."

"Cleared F-M-S Runway Three Six Approach."

"Cleared I-L-S Approach."

"Cleared Localizer Back Course Runway One Three

Approach."

"Cleared R-NAV Runway Two Two Approach."

"Cleared GPS Runway Two Approach."

"Cleared BRANCH ONE R-NAV Arrival and R-NAV Runway One Three Approach."

"Cleared I-L-S Runway Three Six Approach, glideslope unusable."

"Cleared M-L-S Approach."

"Cleared M-L-S Runway Three Six Approach."

"Cleared M-L-S Runway Three Six Approach, glidepath unusable."

NOTE-

① Clearances authorizing instrument approaches are issued on the basis that, if visual contact with the ground is made before the approach is completed, the entire approach procedure will be followed unless the pilot receives approval for a contact approach, is cleared for a visual approach, or cancels their IFR flight plan.

② Approach clearances are issued based on known traffic. The receipt of an approach clearance does not relieve the pilot of his responsibility to comply with applicable Parts of Title 14 of the Code of Federal Regulations and the notations on instrument approach charts which levy on the pilot the responsibility to comply with or act on an instruction; e.g., "Straight-in minima not authorized at night," "Procedure not authorized when glideslope / glidepath not used," "Use of procedure limited to aircraft authorized to use airport," or "Procedure not authorized at night."

③ The name of the approach, as published, is used to identify the approach, even though a component of the approach aid, other than the localizer on an ILS or the azimuth on an MLS is inoperative. Where more than one procedure to the same runway is published on a single chart, each must adhere to all final approach guidance contained on that chart, even though each procedure will be treated as a separate entity when authorized by ATC. For example, Instrument Approach Procedures published on a chart as either HI-VOR / DME or TACAN 1 would be stated as either "HI V-O-R / D-M-E 1 Runway Six Left Approach" or "HI TACAN 1 Runway Six Left Approach." The use of numerical identifiers in the approach name, such as "HI TACAN 1 Rwy 6L or HI TACAN 2 Rwy 6L," denotes multiple straight-in approaches to the same runway that use the same approach aid. Alphabetical suffixes denote a procedure that does not meet the criteria for straight-in landing minimums authorization."

④ FAR Part 91.175 (j) requires a pilot to receive a clearance for a procedure turn when vectored to a final approach fix or position, conducting a timed approach, or

informs it "radar contact lost" or "radar service terminated."

REFERENCE-
PICG TERM- RADAR CONTACT.

a. When required, inform an aircraft of its position with respect to a fix or airway.

PHRASEOLOGY-
OVER / PASSING (fix)

(number of miles) **MILES FROM (fix).**

(number of miles) **MILES (direction) OF (fix, airway, or location).**

CROSSING / JOINING / DEPARTING (airway or route).

INTERCEPTING / CROSSING (name of navaid)
(specified) RADIAL.

5-1-13. RADAR SERVICE TERMINATION

a. Inform aircraft when radar service is terminated.

PHRASEOLOGY-
RADAR SERVICE TERMINATED (nonradar routing if required).

b. Radar service is automatically terminated and the aircraft need not be advised of termination when:

NOTE-

☐ Termination of radar monitoring when conducting simultaneous ILS / MLS approaches is prescribed in

para 5-9-7.

☑ Termination of radar monitoring where PAR equipment is used to monitor approaches is prescribed in para 5-13-3.

1. An aircraft cancels its IFR flight plan, except within Class B airspace, Class C airspace, TRSA, or where basic radar service is provided.

2. An aircraft conducting an instrument, visual, or contact approach has landed or has been instructed to change to advisory frequency.

3. At tower-controlled airports where radar coverage does not exist to within $\frac{1}{2}$ mile of the end of the runway, arriving aircraft shall be informed when radar service is terminated.

REFERENCE-
FAAO 7110.3, RADAR TOLERANCES, Para 12-55A

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

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

REFERENCE-
FAAO 7110.65, SERVICE PROVIDED WHEN TOWER IS INOPERATIVE, Para 7-6-12.

Section 9. RADAR ARRIVALS

5-9-1. VECTORS TO FINAL APPROACH COURSE

Except as provided in para 7-4-2, vector arriving aircraft to intercept the final approach course:

a. At least 2 miles outside the approach gate unless one of the following exists:

1. When the reported ceiling is at least 500 feet above the MVA / MIA and the visibility is at least 3 miles (report may be a PIREP if no weather is reported for the airport), aircraft may be vectored to intercept the final approach course closer than 2 miles outside the approach gate but no closer than the approach gate.

2. If specifically requested by the pilot, aircraft may be vectored to intercept the final approach course inside the approach gate but no closer than the final approach fix.

b. For a precision approach, at an altitude not above the glideslope / glidepath or below the minimum glideslope intercept altitude specified on the approach procedure chart.

c. For a nonprecision approach, at an altitude which will allow descent in accordance with the published procedure.

NOTE-

A pilot request for an "Evaluation Approach," or a "Coupled Approach," or use of a similar term, indicates the pilot desires the application of subparagraphs a. and b.

d. **EN ROUTE:** The following provisions are required before an aircraft may be vectored to the final approach course:

1. The approach gate and a line (solid or broken), depicting the final approach course—starting at or passing through the approach gate and extending away from the airport, be displayed on the radar scope; for a precision approach, the line length shall extend at least the maximum range of the localizer; for a nonprecision approach, the line length shall extend at least 10NM outside the approach gate, and:

2. The maximum range selected on the radar display is 150 NM, or;

3. An adjacent radar display is set at 125 NM or less, configured for the approach in use, and is utilized for the vector to the final approach course.

4. If unable to comply with 1. , 2. , or 3. above, issue the clearance in accordance with Para 4-8-1 of this order.

REFERENCE-

FAAO 7110.65, APPROACH CLEARANCE, Para 4-8-1.
FAAO 7110.65, FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

5-9-2. FINAL APPROACH COURSE INTERCEPTION

a. Assign headings that will permit final approach course interception on a track that does not exceed the interception angles specified in the TBL 5-9-1.

Approach Course Interception Angle

Distance from interception point to approach gate	Maximum interception angle
Less than 2 miles or Triple Simultaneous ILS / MLS Approaches in use	20 degrees
2 miles or more	30 degrees (45 degrees for helicopters)

TBL 5-9-1

b. If deviations from the final approach course are observed after initial course interception, apply the following:

1. Outside the approach gate: Apply procedures in accordance with subpara a. , if necessary, vector the aircraft for another approach.

2. Inside the approach gate: Inform the pilot of the aircraft's position and ask intentions.

PHRASEOLOGY-

(ident) (distance) MILE(S) FROM THE AIRPORT,
(distance) MILE(S) RIGHT / LEFT OF COURSE, SAY INTENTIONS.

NOTE-

The intent is to provide for a trackcourse intercept angle judged by the controller to be no greater than specified by this procedure.

REFERENCE-

FAAO 7110.65, Chapter 5, Section 9. , and Section 10.

c. **EN ROUTE:** When using a radar scope range above 125 NM, the controller shall solicit and receive a pilot report that the aircraft is established on the final approach course. If the pilot has not reported established by the final approach gate, inform the pilot of his observed position and ask intentions.

NOTE-

It may be difficult to accurately determine small distances when using very large range settings.

I-17

5-9-3. VECTORS ACROSS FINAL APPROACH COURSE

Inform the aircraft whenever a vector will take it across the final approach course and state the reason for such action.

NOTE-

In the event you are unable to so inform the aircraft, the pilot is not expected to turn inbound on the final approach course unless approach clearance has been issued.

PHRASEOLOGY-

EXPECT VECTORS ACROSS FINAL FOR (purpose).

EXAMPLE-

"EXPECT VECTORS ACROSS FINAL FOR SPACING."

REFERENCE-

FAAO 7110.65, FINAL APPROACH COURSE INTERCEPTION, Para 5-9-2.

5-9-4. ARRIVAL INSTRUCTIONS

Issue all of the following to an aircraft before it reaches the approach gate:

a. Position relative to a fix on the final approach course. If none is portrayed on the radar display or if none is prescribed in the procedure, issue position information relative to the navigation aid which provides final approach guidance or relative to the airport.

b. Vector to intercept the final approach course if required.

c. Approach clearance except when conducting a radar approach. Issue approach clearance only after the aircraft is:

1. Established on a segment of a published route or instrument approach procedure, or
(See FIG 5-9-1 Example 1)

2. Assigned an altitude to maintain until the aircraft is established on a segment of a published route or instrument approach procedure.
(See FIG 5-9-2 thru FIG 5-9-4.)

EXAMPLE-

☐ Aircraft 1 was vectored to the final approach course but clearance was withheld. It is now at 4,000 feet and established on a segment of the instrument approach procedure. "Seven miles from X-RAY. Cleared I-L-S runway three six approach."
(See FIG 5-9-1.)

Arrival Instructions

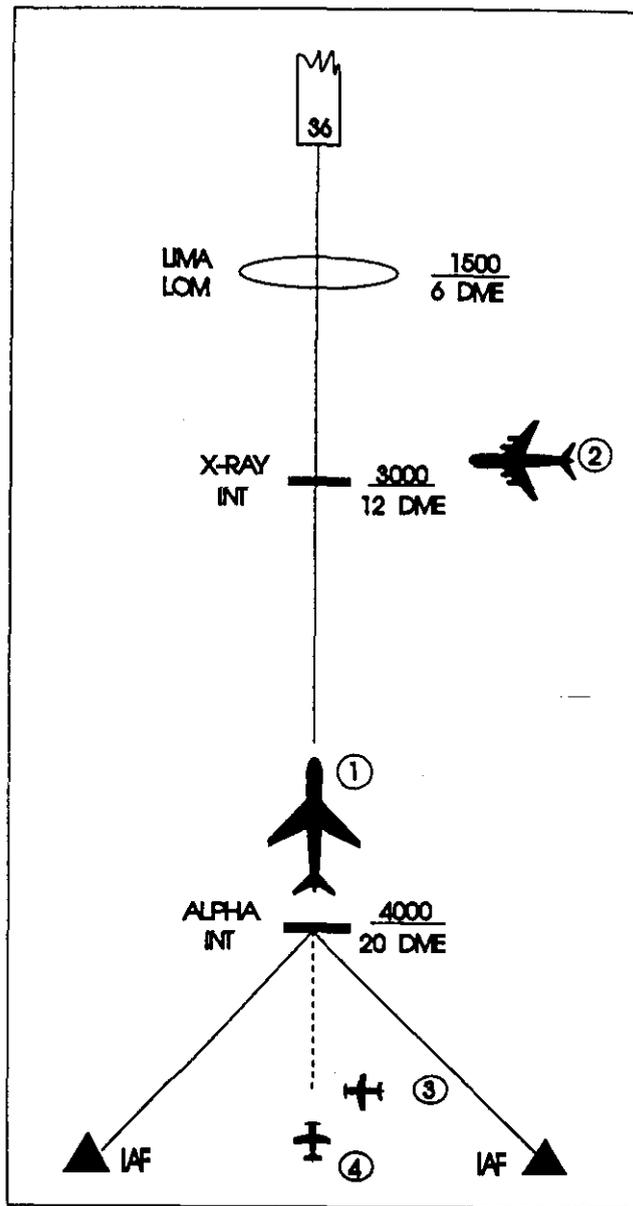


FIG 5-9-1

EXAMPLE-

☒ Aircraft 2 is being vectored to a published segment of the final approach course, 4 miles from LIMA at 2,000 feet. The MVA for this area is 2,000 feet. "Four miles from LIMA. Turn right heading three four zero. Maintain two thousand until established on the localizer. Cleared I-L-S runway three six approach."
(See FIG 5-9-1.)

*M-L-S runway one eight approach.”
(See FIG 5-9-4.)*

NOTE-

① *The altitude assigned must assure IFR obstruction clearance from the point at which the approach clearance is issued until established on a segment of a published route or instrument approach procedure.*

② *If the altitude assignment is VFR-On-Top, it is conceivable that the pilot may elect to remain high until arrival over the final approach fix which may require the pilot to circle to descend so as to cross the final approach fix at an altitude that would permit landing.*

d. Instructions to do one of the following:

NOTE-

The principal purpose of this paragraph is to ensure that frequency changes are made prior to passing the final approach fix. However, at times it will be desirable to retain an aircraft on the approach control frequency to provide a single-frequency approach or other radar services. When this occurs, it will be necessary to relay tower clearances or instructions to preclude changing frequencies prior to landing or approach termination.

1. Monitor local control frequency, reporting to the tower when over the approach fix.

2. Contact the tower on local control frequency.

REFERENCE-

FAAO 7110.65, COMMUNICATIONS RELEASE, Para 4-8-8.

3. Contact the final controller on the appropriate frequency if radar service will be provided on final on a different frequency.

REFERENCE-

FAAO 7110.65, FINAL CONTROLLER CHANGEOVER, Para 5-10-8.

4. When radar is used to establish the final approach fix, inform the pilot that after being advised that he is over the fix he is to contact the tower on local control frequency.

EXAMPLE-

“Three miles from final approach fix. Turn left heading zero one zero. Maintain two thousand until established on the localizer. Cleared I-L-S runway three six approach. I will advise when over the fix.”

“Over final approach fix. Contact tower one one eight point one.”

NOTE-

ARSR may be used for establishment of initial approach and intermediate approach fixes only. ASR must be used to establish the final approach fix.

REFERENCE-

FAAO 7110.65, FINAL APPROACH COURSE INTERSECTION, Para 5-9-2.

FAAO 7110.65, SIMULTANEOUS ILS / MLS APPROACHES- DUAL & TRIPLE, Para 5-9-7.

e. Where a Terminal Arrival Area (TAA) has been established to support RNAV approaches, inform the aircraft of its position relative to the appropriate IAF and issue the approach clearance. (See FIG 5-9-5)

EXAMPLE-

① *Aircraft 1: The aircraft is in the straight in area of the TAA. “Seven miles from CENTR, Cleared R-NAV Runway One Eight Approach.”*

② *Aircraft 2: The aircraft is in the right base area of the TAA. “Four miles from Write, Cleared for FMS Runway One Eight Approach.”*

③ *Aircraft 3: The aircraft is in the left base area of the TAA. “Fifteen miles from LEFTT, Cleared GPS Runway One Eight Approach.”*

I-19

Section 14. AUTOMATION— EN ROUTE

5-14-1. CONFLICT ALERT AND MODE C INTRUDER ALERT

a. When a conflict alert or Mode C Intruder (MCI) Alert is displayed, evaluate the reason for the alert without delay and take appropriate action.

NOTE—

DARC does not have conflict / MCI alert capability.

REFERENCE—

FAAO 7110.65, SAFETY ALERT, Para 2-1-6.

b. If another controller is involved in the alert, initiate coordination to ensure an effective course of action. Coordination is not required when immediate action is dictated.

c. Suppressing / Inhibiting Conflict / MCI Alert.

1. The controller may suppress the display of a Conflict / MCI Alert from a control position with the application of one of the following suppress / inhibit computer functions:

(a) The Conflict Suppress (CO) function may be used to suppress the CA / MCI display between specific aircraft for a specific alert.

NOTE—

See NAS—MD—678 for the EARTS conflict suppress message.

(b) The Group Suppression (SG) function shall be applied exclusively to inhibit the displaying of alerts among military aircraft engaged in special military operations where standard en route separation criteria do not apply.

NOTE—

Special military operations where the SG function would typically apply involve those activities where military aircraft routinely operate in proximities to each other that are less than standard en route separation criteria; i.e., air refueling operations, ADC practice intercept operations, etc.

2. The computer entry of a message suppressing a Conflict / MCI Alert constitutes acknowledgment for the alert and signifies that appropriate action has or will be taken.

3. The Conflict / MCI Alert may not be suppressed or inhibited at or for another control position without being coordinated.

5-14-2. EN ROUTE MINIMUM SAFE ALTITUDE WARNING (E-MSAW)

a. When an E-MSAW alert is displayed, immediately analyze the situation and, if necessary, take the appropriate action to resolve the alert.

NOTE—

① *Caution should be exercised when issuing a clearance to an aircraft in reaction to an E-MSAW alert to ensure that adjacent MIA AREAS ARE not a factor.*

② *DARC does not have E-MSAW capability.*

REFERENCE—

FAAO 7110.65, SAFETY ALERT, Para 2-1-6.

b. The controller may suppress the display of an E-MSAW alert from his control position with the application of one of the following suppress / inhibit computer functions:

1. The Specific Alert Suppression message may be used to inhibit the E-MSAW alerting display on a single flight for a specific alert.

2. The Indefinite Alert Suppression message shall be used exclusively to inhibit the display of E-MSAW alerts on aircraft known to be flying at an altitude that will activate the alert feature of one or more MIA areas within an ARTCC.

NOTE—

① *The Indefinite Alert Suppression message will remain in effect for the duration of the referenced flight's active status within the ARTCC unless modified by controller action.*

② *The Indefinite Alert Suppression message would typically apply to military flights with clearance to fly low-level type routes that routinely require altitudes below established minimum IFR altitudes.*

c. The computer entry of a message suppressing or inhibiting E-MSAW alerts constitutes acknowledgment for the alert and indicates that appropriate action has or will be taken to resolve the situation.

5-14-3. COMPUTER ENTRY OF ASSIGNED ALTITUDE

The data block shall always reflect the current status of the aircraft unless otherwise specified in a facility directive. Whenever an aircraft is cleared to maintain an altitude different from that in the flight plan data base, enter into the computer one of the following:

NOTE-

A facility directive may be published deleting the interim altitude computer entry requirements of subparagraph b. The directive would apply to those conditions where heavy traffic or sector complexity preclude meeting these entry requirements.

REFERENCE-

FAAO 7210.3, WAIVER OF INTERIM ALTITUDE REQUIREMENTS, Para 10-27.

a. The new assigned altitude if the aircraft will (climb or descend to and) maintain the new altitude, or

b. An interim altitude if the aircraft will (climb or descend to and) maintain the new altitude for a short period of time and subsequently be recleared to the altitude in the flight plan data base or a new altitude or a new interim altitude.

NOTE-

[1] Use of the interim altitude function will ensure that the data block reflects the actual status of the aircraft and eliminate superfluous altitude updates.

[2] EARTS does not have interim altitude capability.

5-14-4. ENTRY OF REPORTED ALTITUDE

Whenever Mode C altitude information is either not available or is unreliable, enter reported altitudes into the computer as follows:

NOTE-

Altitude updates are required to assure maximum accuracy in applying slant range correction formulas.

- a. When an aircraft reaches the assigned altitude.
- b. When an aircraft at an assigned altitude is issued a clearance to climb or descend.
- c. A minimum of each 10,000 feet during climb to or descent from FL 180 and above.

5-14-5. SELECTED ALTITUDE LIMITS

To ensure the display of Mode C targets and data blocks, take the following actions:

NOTE-

Exception to these requirements may be authorized for specific altitudes in certain center sectors if defined in appropriate facility directives and approved by the Regional AT Division manager.

a. National Airspace System (NAS) en route Stage A / direct access radar channel (DARC): Display altitude

limits in the "R" CRD when operating on NAS en route Stage A or on the plan view display (PVD) when operating on DARC and select the display filter keys on the PVD to include, as a minimum, the altitude stratum of the sector, plus:

1. 1,200 feet above the highest and below the lowest altitude or flight level of the sector where 1,000 feet vertical separation is applicable, and

2. 2,200 feet above the highest and below the lowest flight level of the sector where 2,000 feet vertical separation is applicable.

b. En Route Automated Radar Tracking System (EARTS): Display the EARTS altitude filter limits to include, as a minimum, the altitude stratum of the sector, and:

1. 1,200 feet above the highest and below the lowest altitude or flight level of the sector where 1,000 feet vertical separation is applicable, and

2. 2,200 feet above the highest and below the lowest flight level of the sector where 2,000 feet vertical separation is applicable.

REFERENCE-

FAAO 7110.65, ALIGNMENT CHECK, Para 5-1-2.

5-14-6. SECTOR ELIGIBILITY

The use of the OK function is allowed to override sector eligibility only when one of the following conditions is met:

- a. Prior coordination is effected.
- b. The flight is within the control jurisdiction of the sector.

5-14-7. COAST TRACKS

Do not use coast tracks in the application of either radar or nonradar separation criteria.

5-14-8. CONTROLLER INITIATED COAST TRACKS

a. Initiate coast tracks only in Flight Plan Aided Tracking (FLAT) mode, except "free" coast tracking may be used as a reminder that aircraft without corresponding computer-stored flight plan information are under your control.

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Section 15. AUTOMATED RADAR TERMINAL SYSTEMS (ARTS)– TERMINAL

5–15–1. APPLICATION

ARTS may be used for identifying aircraft assigned a discrete beacon code, maintaining identity of targets, and performing handoffs of these targets between controllers.

NOTE–

USAF / USN: Where PIDP / DAIR equipment is capable of performing the functions described in this section, it may be used accordingly.

5–15–2. RESPONSIBILITY

This equipment does not relieve the controller of the responsibility to ensure proper identification, maintenance of identity, handoff of the correct target associated with the alphanumeric data, and separation of aircraft.

5–15–3. FUNCTIONAL USE

In addition to other uses specified herein, terminal automation may be used for the following functions:

- a. Tracking.
- b. Tagging.
- c. Handoff.
- d. Altitude information.

REFERENCE–

FAA ORDER 7110.65, ALTITUDE FILTERS, PARAGRAPH 5–2–24.

- e. Coordination.
- f. Ground speed.
- g. Identification.

5–15–4. SYSTEM REQUIREMENTS

Use the ARTS as follows:

NOTE–

Locally developed procedures, operating instructions, and training material are required because of differences in equipment capability. Such locally developed procedures shall be supplemental to those contained in this section and shall be designed to make maximum use of the arts equipment.

a. Inform all appropriate positions before terminating or reinstating use of the ARTS at a control position. When terminating the use of ARTS, all

pertinent flight data of that position shall be transferred or terminated.

b. Inform other interfaced facilities of scheduled and unscheduled shutdowns.

c. Initiate a track/tag on all aircraft to the maximum extent possible. As a minimum, aircraft identification should be entered, and automated handoff functions should be used.

d. Assigned altitude, if displayed, shall be kept current at all times. Climb and descent arrows, where available, shall be used to indicate other than level flight.

e. Do not use the automatic altitude readout of an aircraft under another controller's jurisdiction for vertical separation purposes without verbal coordination.

5–15–5. INFORMATION DISPLAYED

a. Two-letter ICAO designators or three-letter designators, as appropriate, shall be used unless program limitations dictate the use of a single letter alpha prefix.

b. Use of the inhibit select switches to remove displayed information no longer required shall be in accordance with local directives, which should ensure maximum required use of the equipment.

c. Information displayed in the ATIS, General Information, and Scratch Pad areas shall be in accordance with local directives.

5–15–6. CONFLICT ALERT / MODE C INTRUDER (MCI)

a. When a Conflict Alert or Mode C Intruder (MCI) Alert is displayed, evaluate the reason for the Alert without delay and take appropriate action.

REFERENCE–

FAA ORDER 7110.65, SAFETY ALERT, PARAGRAPH 2–1–6.

b. If another controller is involved in the Alert, initiate coordination to ensure an effective course of action. Coordination is not required when immediate action is dictated.

c. Suppressing / Inhibiting Conflict Alert / MCI alert. ■

1. The suppress function may be used to suppress the display of a specific Conflict Alert / MCI Alert.

2. The inhibit function shall only be used to inhibit the display of Conflict Alert for aircraft routinely engaged in operations where standard separation criteria do not apply.

NOTE-

Examples of operations where standard separation criteria do not apply are ADC practice intercept operations and air shows.

3. Computer entry of a message suppressing a Conflict Alert / MCI Alert constitutes acknowledgment for the Alert and signifies that appropriate action has or will be taken.

4. Conflict / MCI Alert may not be suppressed or inhibited at or for another control position without being coordinated.

5-15-7. INHIBITING MINIMUM SAFE ALTITUDE WARNING (MSAW)

a. Inhibit MSAW processing of VFR aircraft and

aircraft that cancel instrument flight rules (IFR) flight plans unless the pilot specifically requests otherwise.

REFERENCE-

FAA ORDER 7110.65, VFR AIRCRAFT IN WEATHER DIFFICULTY, PARAGRAPH 10-2-7.

FAA ORDER 7110.65, RADAR ASSISTANCE TO VFR AIRCRAFT IN WEATHER DIFFICULTY, PARAGRAPH 10-2-8.

b. A low altitude alert may be suppressed from the control position. Computer entry of the suppress message constitutes an acknowledgment for the alert and indicates that appropriate action has or will be taken.

5-15-8. TRACK SUSPEND FUNCTION

Use the track suspend function only when data block overlap in holding patterns or in proximity of the final approach create an unworkable situation. If necessary to suspend tracks, those which are not displaying automatic altitude readouts shall be suspended. If the condition still exists, those displaying automatic altitude readouts may then be suspended.

I-23

Section 2. EMERGENCY ASSISTANCE

10-2-1. INFORMATION REQUIREMENTS

a. Start assistance as soon as enough information has been obtained upon which to act. Information requirements will vary, depending on the existing situation. Minimum required information for in-flight emergencies is:

NOTE-

In the event of an ELT signal see para 10-2-10.

1. Aircraft identification and type.
2. Nature of the emergency.
3. Pilot's desires.

b. After initiating action, obtain the following items or any other pertinent information from the pilot or aircraft operator, as necessary:

NOTE-

Normally, do not request this information from military fighter-type aircraft that are at low altitudes (i.e. on approach, immediately after departure, on a low level route, etc.). However, request the position of an aircraft that is not visually sighted or displayed on radar if the location is not given by the pilot.

1. Aircraft altitude.
2. Fuel remaining in time.
3. Pilot reported weather.
4. Pilot capability for IFR flight.
5. Time and place of last known position.
6. Heading since last known position.
7. Airspeed.
8. Navigation equipment capability.
9. NAVAID signals received.
10. Visible landmarks.
11. Aircraft color.
12. Number of people on board.
13. Point of departure and destination.
14. Emergency equipment on board.

10-2-2. FREQUENCY CHANGES

Although 121.5 MHz and 243.0 MHz are emergency frequencies, it might be best to keep the aircraft on the

initial contact frequency. Change frequencies only when there is a valid reason.

10-2-3. AIRCRAFT ORIENTATION

Orientate an aircraft by the means most appropriate to the circumstances. Recognized methods include:

- a. Radar.
- b. DF.
- c. NAVAID's.
- d. Pilotage.
- e. Sighting by other aircraft.

10-2-4. ALTITUDE CHANGE FOR IMPROVED RECEPTION

When you consider it necessary and if weather and circumstances permit, recommend that the aircraft maintain or increase altitude to improve communications, radar, or DF reception.

NOTE-

Aircraft with high-bypass turbofan engines (such as B747) encountering volcanic ash clouds have experienced total loss of power to all engines. Damage to engines due to volcanic ash ingestion increases as engine power is increased, therefore, climb while in the ash cloud is to be avoided where terrain permits.

REFERENCE-

AIM, FLIGHT OPERATIONS IN VOLCANIC ASH, PARA 7-5-7

10-2-5. EMERGENCY SITUATIONS

Consider that an aircraft emergency exists and inform the RCC or ARTCC and alert the appropriate DF facility when:

NOTE-

☐ *USAF facilities are only required to notify the ARTCC.*

☑ *The requirement to alert DF facilities may be deleted if radar contact will be maintained throughout the duration of the emergency.*

a. An emergency is declared by either:

1. The pilot.
2. Facility personnel.
3. Officials responsible for the operation of the aircraft.

b. There is unexpected loss of radar contact and radio communications with any IFR or VFR aircraft.

c. If the pilot states he is not qualified for or not capable of conducting IFR flight, or if he refuses to file an IFR flight plan, take whichever of the following actions is appropriate:

1. Inform the pilot of airports where VFR conditions are reported, provide other available pertinent weather information, and ask if he will elect to conduct VFR flight to such an airport.

2. If the action in subparagraph 1. above is not feasible or the pilot declines to conduct VFR flight to another airport, provide radar assistance if the pilot:

(a) Declares an emergency.

(b) Refuses to declare an emergency and you have determined the exact nature of the radar services the pilot desires.

3. If the aircraft has already encountered IFR conditions, inform the pilot of the appropriate terrain / obstacle clearance minimum altitude. If the aircraft is below appropriate terrain / obstacle clearance minimum altitude and sufficiently accurate position information has been received or radar identification is established, furnish a heading or radial on which to climb to reach appropriate terrain / obstacle clearance minimum altitude.

d. 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.

10-2-9. RADAR ASSISTANCE TECHNIQUES

Use the following techniques to the extent possible when you provide radar assistance to a pilot not qualified to operate in IFR conditions:

a. Avoid radio frequency changes except when necessary to provide a clear communications channel.

b. Make turns while the aircraft is in VFR conditions so it will be in a position to fly a straight course while in IFR conditions.

c. Have pilot lower gear and slow aircraft to approach speed while in VFR conditions.

d. Avoid requiring a climb or descent while in a turn if in IFR conditions.

e. Avoid abrupt maneuvers.

f. Vector aircraft to VFR conditions.

g. 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.

10-2-10. EMERGENCY LOCATOR TRANSMITTER (ELT) SIGNALS

When an ELT signal is heard or reported:

a. **EN ROUTE:** Notify the Rescue Coordination Center (RCC).

NOTE-

FAA Form 7210-8, *ELT INCIDENT*, contains standardized format for coordination with the RCC.

REFERENCE-

FAAO 7210.3, PARA 11-30.

b. **TERMINAL:** Notify the ARTCC which will coordinate with the Rescue Coordination Center (RCC).

NOTE-

Operational ground testing of emergency locator transmitters (ELT'S) has been authorized during the first 5 minutes of each hour. To avoid confusing the tests with an actual alarm, the testing is restricted to no more than three audio sweeps.

Controllers can expect pilots to report aircraft position and time the signal was first heard, aircraft position and time the signal was last heard, aircraft position at maximum signal strength, flight altitude, and frequency of the emergency signal (121.5 / 243.0). (See AIM, *Emergency Locator Transmitters, Para 6-2-5.*)

c. **EN ROUTE:** Request DF facilities obtain fixes or bearings on signal. Forward bearings or fixes obtained plus any other pertinent information to the RCC.

d. **TERMINAL:** Attempt to obtain fixes or bearings on the signal.

e. Solicit the assistance of other aircraft known to be operating in the signal area.

a. In designated mountainous areas, 2,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

b. Other than mountainous areas, 1,000 feet above the highest obstacle within a horizontal distance of 4 nautical miles from the course to be flown; or

c. As otherwise authorized by the Administrator or assigned by ATC.

(See *MINIMUM EN ROUTE IFR ALTITUDE*).

(See *MINIMUM OBSTRUCTION CLEARANCE ALTITUDE*).

(See *MINIMUM CROSSING ALTITUDE*).

(See *MINIMUM SAFE ALTITUDE*).

(See *MINIMUM VECTORING ALTITUDE*).

(Refer to Part 91).

MINIMUM NAVIGATION PERFORMANCE SPECIFICATION— A set of standards which require aircraft to have a minimum navigation performance capability in order to operate in MNPS designated airspace. In addition, aircraft must be certified by their State of Registry for MNPS operation.

MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS AIRSPACE— Designated airspace in which MNPS procedures are applied between MNPS certified and equipped aircraft. Under certain conditions, non-MNPS aircraft can operate in MNPSA. However, standard oceanic separation minima is provided between the non-MNPS aircraft and other traffic. Currently, the only designated MNPSA is described as follows:

a. Between FL 275 and FL 400;

b. Between latitudes 27° N and the North Pole;

c. In the east, the eastern boundaries of the CTA's Santa Maria Oceanic, Shanwick Oceanic, and Reykjavik;

d. In the west, the western boundaries of CTA's Reykjavik and Gander Oceanic and New York Oceanic excluding the area west of 60° W and south of 38°–30' N.

MINIMUM OBSTRUCTION CLEARANCE ALTITUDE— The lowest published altitude in effect between radio fixes on VOR airways, off-airway routes, or route segments which meets obstacle clearance requirements for the entire route segment and which assures acceptable navigational signal coverage only within 25 statute (22 nautical) miles of a VOR.

(Refer to Part 91).

(Refer to Part 95).

MINIMUM RECEPTION ALTITUDE— The lowest altitude at which an intersection can be determined.

(Refer to Part 95).

MINIMUM SAFE ALTITUDE—

a. The minimum altitude specified in Part 91 for various aircraft operations.

b. Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance for emergency use within a specified distance from the navigation facility upon which a procedure is predicated. These altitudes will be identified as Minimum Sector Altitudes or Emergency Safe Altitudes and are established as follows:

1. **Minimum Sector Altitudes.** Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance within a 25-mile radius of the navigation facility upon which the procedure is predicated. Sectors depicted on approach charts must be at least 90 degrees in scope. These altitudes are for emergency use only and do not necessarily assure acceptable navigational signal coverage.

(See *ICAO term Minimum Sector Altitude*).

2. **Emergency Safe Altitudes.** Altitudes depicted on approach charts which provide at least 1,000 feet of obstacle clearance in nonmountainous areas and 2,000 feet of obstacle clearance in designated mountainous areas within a 100-mile radius of the navigation facility upon which the procedure is predicated and normally used only in military procedures. These altitudes are identified on published procedures as "Emergency Safe Altitudes."

MINIMUM SAFE ALTITUDE WARNING— A function of the ARTS III computer that aids the controller by alerting him when a tracked Mode C— equipped aircraft is below or is predicted by the computer to go below a predetermined minimum safe altitude.

(Refer to AIM).

MINIMUM SECTOR ALTITUDE [ICAO]— The lowest altitude which may be used under emergency conditions which will provide a minimum clearance of 300 m (1,000 feet) above all obstacles located in an area contained within a sector of a circle of 46 km (25 NM) radius centered on a radio aid to navigation.

MINIMUMS— Weather condition requirements established for a particular operation or type of operation; e.g., IFR takeoff or landing, alternate airport for IFR flight plans, VFR flight, etc.

(See *LANDING MINIMUMS*).

(See *IFR TAKEOFF MINIMUMS AND DEPARTURE PROCEDURES*).

(See *VFR CONDITIONS*).

(See *IFR CONDITIONS*).

(Refer to Part 91).

(Refer to AIM).

MINIMUM VECTORING ALTITUDE— The lowest MSL altitude at which an IFR aircraft will be vectored by a radar controller, except as otherwise authorized for radar approaches, departures, and missed approaches. The altitude meets IFR obstacle clearance criteria. It may be

provided until radar identification is terminated. Radar service may also be provided within the limits of necessity and capability. When a pilot is informed of "radar contact," he automatically discontinues reporting over compulsory reporting points.

(See *RADAR CONTACT LOST*).

(See *RADAR FLIGHT FOLLOWING*).

(See *RADAR SERVICE*).

(See *RADAR SERVICE TERMINATED*).

(Refer to *AIM*).

b. The term used to inform the controller that the aircraft is identified and approval is granted for the aircraft to enter the receiving controllers airspace.

(See *ICAO term RADAR CONTACT*).

RADAR CONTACT LOST— Used by ATC to inform a pilot that radar data used to determine the aircraft's position is no longer being received, or is no longer reliable and radar service is no longer being provided. The loss may be attributed to several factors including the aircraft merging with weather or ground clutter, the aircraft operating below radar line of sight coverage, the aircraft entering an area of poor radar return, failure of the aircraft transponder, or failure of the ground radar equipment.

(See *CLUTTER*).

(See *RADAR CONTACT*).

RADAR CLUTTER [ICAO]— The visual indication on a radar display of unwanted signals.

RADAR CONTACT [ICAO]— The situation which exists when the radar blip or radar position symbol of a particular aircraft is seen and identified on a radar display.

RADAR ENVIRONMENT— An area in which radar service may be provided.

(See *ADDITIONAL SERVICES*).

(See *RADAR CONTACT*).

(See *RADAR SERVICE*).

(See *TRAFFIC ADVISORIES*).

RADAR FLIGHT FOLLOWING— The observation of the progress of radar identified aircraft, whose primary navigation is being provided by the pilot, wherein the controller retains and correlates the aircraft identity with the appropriate target or target symbol displayed on the radar scope.

(See *RADAR CONTACT*).

(See *RADAR SERVICE*).

(Refer to *AIM*).

RADAR IDENTIFICATION— The process of ascertaining that an observed radar target is the radar return from a particular aircraft.

(See *RADAR CONTACT*).

(See *RADAR SERVICE*).

(See *ICAO term RADAR IDENTIFICATION*).

RADAR IDENTIFICATION [ICAO]— The process of correlating a particular radar blip or radar position symbol with a specific aircraft.

RADAR IDENTIFIED AIRCRAFT— An aircraft, the position of which has been correlated with an observed target or symbol on the radar display.

(See *RADAR CONTACT*).

(See *RADAR CONTACT LOST*).

RADAR MONITORING— (See *RADAR SERVICE*).

RADAR NAVIGATIONAL GUIDANCE— (See *RADAR SERVICE*).

RADAR POINT OUT— An action taken by a controller to transfer the radar identification of an aircraft to another controller if the aircraft will or may enter the airspace or protected airspace of another controller and radio communications will not be transferred.

RADAR REQUIRED— A term displayed on charts and approach plates and included in FDC Notams to alert pilots that segments of either an instrument approach procedure or a route are not navigable because of either the absence or unusability of a NAVAID. The pilot can expect to be provided radar navigational guidance while transiting segments labeled with this term.

(See *RADAR ROUTE*).

(See *RADAR SERVICE*).

RADAR ROUTE— A flight path or route over which an aircraft is vectored. Navigational guidance and altitude assignments are provided by ATC.

(See *FLIGHT PATH*).

(See *ROUTE*).

RADAR SEPARATION— (See *RADAR SERVICE*).

RADAR SERVICE— A term which encompasses one or more of the following services based on the use of radar which can be provided by a controller to a pilot of a radar identified aircraft.

a. **Radar Monitoring.** The radar flight-following of aircraft, whose primary navigation is being performed by the pilot, to observe and note deviations from its authorized flight path, airway, or route. When being applied specifically to radar monitoring of instrument approaches; i.e., with precision approach radar (PAR) or radar monitoring of simultaneous ILS/MLS approaches, it includes advice and instructions whenever an aircraft