



**Federal Aviation  
Administration**

# **Initial En Route Qualification Training**

## **Lesson 38 Emergencies**

**Course 50148001**

## LESSON PLAN DATA SHEET

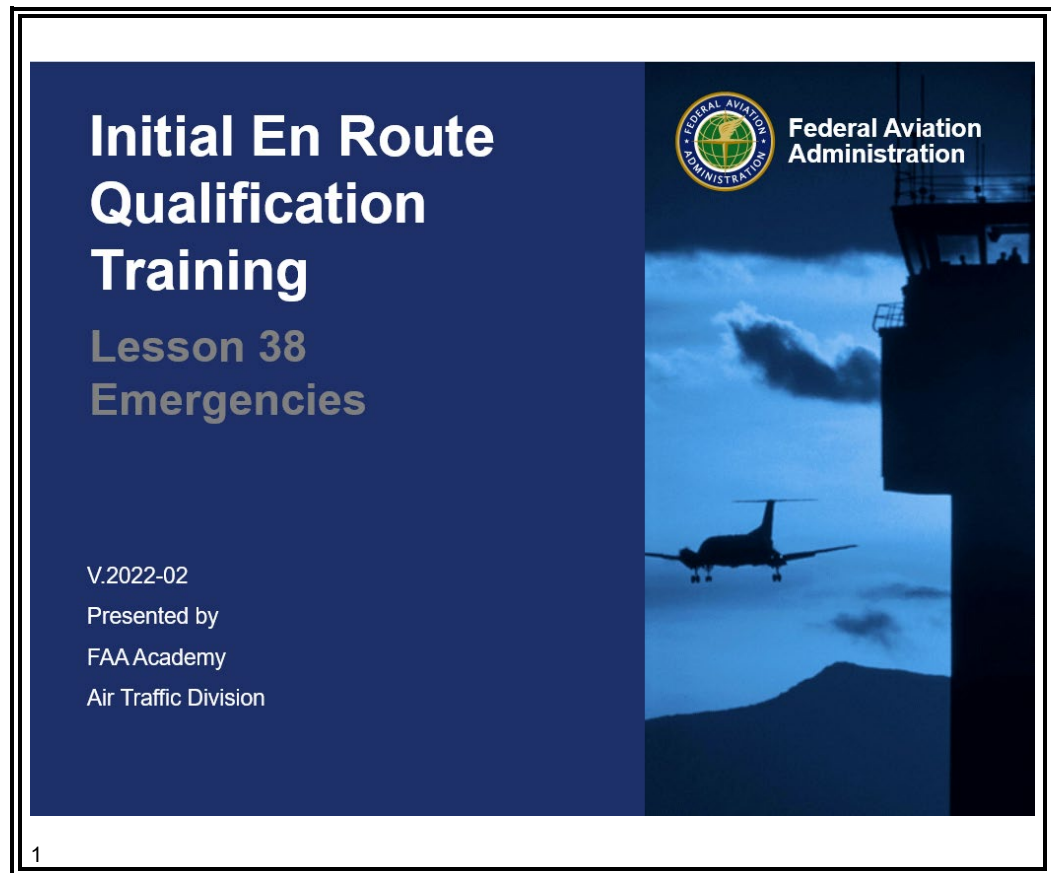
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<b>LESSON TITLE:</b>	EMERGENCIES
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<b>HANDOUT(S):</b>	NONE
<b>EXERCISE(S)/ ACTIVITY(S):</b>	NONE
<b>END-OF-LESSON TEST:</b>	YES
<b>PERFORMANCE TEST:</b>	NONE
<b>MATERIALS:</b>	NONE
<b>OTHER PERTINENT INFORMATION:</b>	NONE

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# INTRODUCTION

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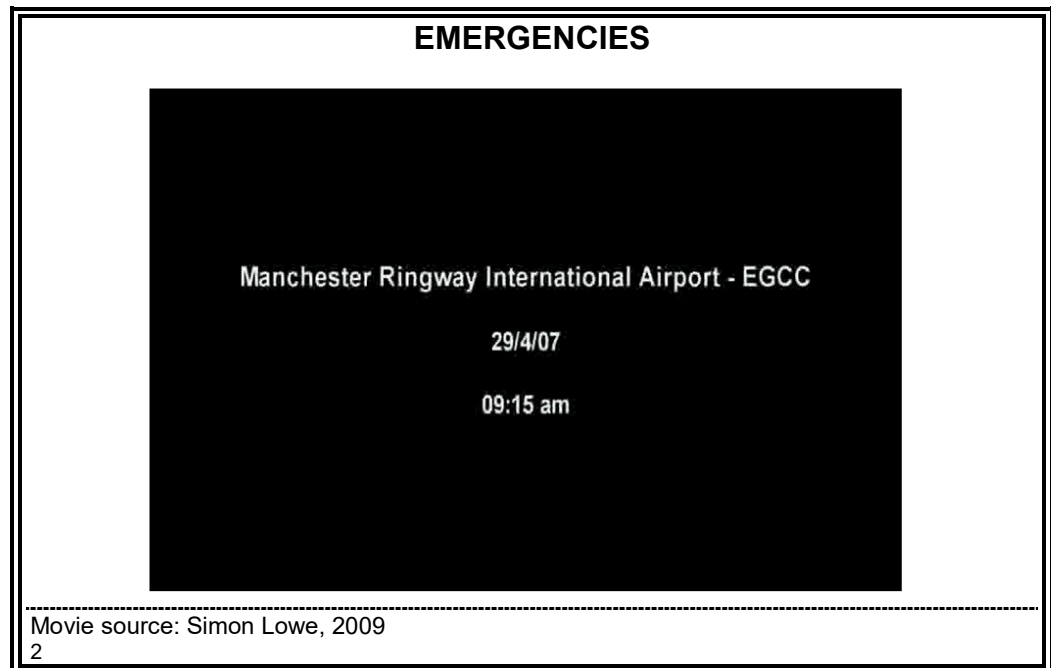


It is necessary for you as a controller to know radar procedures for identification and separation when working aircraft in a routine, everyday environment.

Having a solid working foundation of these procedures will enable you to calmly and effectively handle aircraft in emergency or unusual situations.

# INTRODUCTION *(Continued)*

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Knowledge of the basic procedures for handling emergency situations is necessary for you to be able to provide pilots with the proper information and assistance. A well prepared and knowledgeable controller can turn potential tragedies into safe outcomes. This lesson provides a general understanding of emergency situations as they pertain to Radar Associate duty requirements.

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## **Purpose**

This lesson covers specific procedures for emergency situations.

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# INTRODUCTION *(Continued)*

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## Lesson Objectives

### LESSON OBJECTIVES

- On an End-of-Lesson Test and in accordance with FAA Order JO 7110.65 and the AIM, you will identify procedures and responsibilities for handling:
  - Aircraft emergencies
  - Unusual situations
  - Overdue aircraft
  - Communications failure

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# GENERAL EMERGENCY INFORMATION

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## General Requirements

JO 7110.65,  
par. 10-1-1

- ⦿ When an emergency exists or is imminent:
  - Pursue the most appropriate course of action
    - Conform as nearly as possible to instructions in FAA JO Order 7110.65

**NOTE:** All emergencies and unusual situations **must** be immediately reported to the supervisor.

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## Emergency Terms

JO 7110.65,  
Pilot/Controller  
Glossary

- ⦿ An emergency can be classified as either a **distress** or **urgency** condition.



**Distress** is a condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.



**Urgency** is a condition of being concerned about safety and of requiring timely but **not** immediate assistance—a potential distress condition.

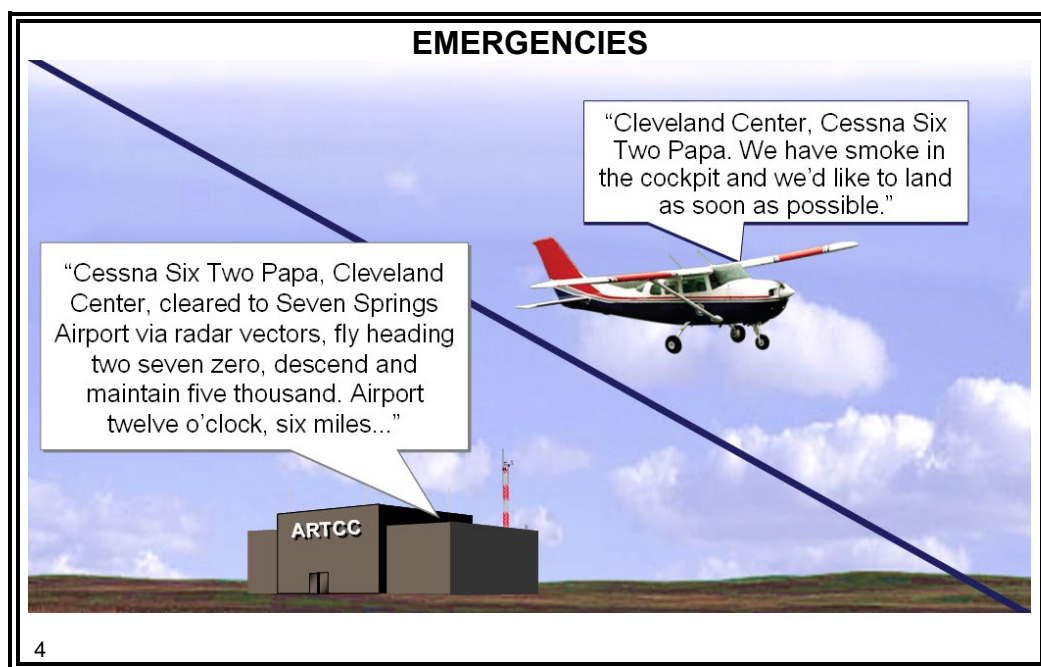
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# GENERAL EMERGENCY INFORMATION *(Continued)*

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## Initial Communication Key Words

JO 7110.65,  
par. 10-1-1



- ⊙ "MAYDAY" - repeated three times by the pilot
  - Distress condition
- ⊙ "PAN-PAN" - repeated three times by the pilot
  - Urgency condition
- ⊙ If "MAYDAY" or "PAN-PAN" is **not** used and you are unsure that a situation constitutes an emergency:
  - Handle as though it were an emergency

**NOTE:** Most emergencies are declared by the pilot in plain language.

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# GENERAL EMERGENCY INFORMATION *(Continued)*

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## Obtaining Information

JO 7110.65,  
par. 10-1-2

- ⦿ Obtain enough information to handle the emergency intelligently.
  - ⦿ Base your decision as to what type assistance is needed on information and requests from the pilot, who is authorized by FAR, Part 91 to determine a course of action.
- 

## Knowledge Check

### KNOWLEDGE CHECK

❓ **QUESTION:** If you are in doubt as to whether an emergency exists, \_\_\_\_\_.

- A. ask the controller
- B. treat the situation as an emergency and inform your supervisor
- C. wait until the pilot declares an emergency

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# EMERGENCY SITUATIONS

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## Emergency Determination

JO 7110.65,  
par. 10-2-5

### EMERGENCY EXAMPLE – ABANDONING AIRCRAFT



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- ⦿ Consider an emergency to exist when any of the following occurs:
  - Emergency is declared by:
    - Pilot
    - Facility personnel
    - Officials responsible for operation of the aircraft
  - There is an unexpected loss of radar contact and radio communications with IFR or VFR aircraft
  - Reports indicate:
    - Forced landing has been made or is imminent
    - Crew has abandoned the aircraft or is about to do so

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# EMERGENCY SITUATIONS *(Continued)*

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## Emergency Determination (Cont'd)

JO 7110.65,  
par. 10-2-5

- Emergency radar beacon response has been received
  - Code 7700 - causes an emergency indicator to blink in Field E of the data block
- Need for ground rescue appears likely
- Emergency Locator Transmitter (ELT) signal is heard or reported

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## Providing Assistance to Aircraft in Distress

JO 7110.65,  
par. 10-1-3

- ⊙ When pilot requests or controller deems necessary, enlist services of:
  - Available radar facilities
  - Military

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## Facility Responsibilities

JO 7110.65,  
pars. 10-1-4,  
10-2-10

- ⊙ ARTCCs (centers) **must** be responsible for receiving and relaying all pertinent ELT signal information to appropriate authorities.
  - ⊙ FSSs serve as central points for collecting and disseminating information on overdue/missing VFR aircraft.
    - Notifying the center about a VFR aircraft emergency allows provision for IFR separation, if necessary
  - ⊙ The facility in communication with an aircraft in distress:
    - **Must** handle the emergency
    - **Must** coordinate and direct activities of assisting facilities
    - May transfer responsibility to another facility **only** if better handling will result
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# EMERGENCY SITUATIONS *(Continued)*

## Controller Responsibilities

JO 7110.65,  
par. 10-1-4

**FACILITY HANDLING EMERGENCY**

"Aero Center, Jackson Approach, point out five miles southwest HEDUD intersection code seven-seven-zero-zero, one zero thousand five hundred, declared an emergency, requesting IFR clearance direct Jackson Airport."



"Code seven seven zero zero, point out approved."

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- ⦿ Forward data about an aircraft in distress to the center in whose area the emergency exists.
- ⦿ When a foreign air carrier is involved:
  - Notify the ARTCC serving the departure or destination airport when either point is in the U.S. for relay to the aircraft operator.

## EMERGENCY SITUATIONS *(Continued)*

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### Knowledge Check

#### KNOWLEDGE CHECK

❖ **QUESTION:** All pertinent ELT signal information shall be forwarded to the appropriate authorities by the \_\_\_\_.

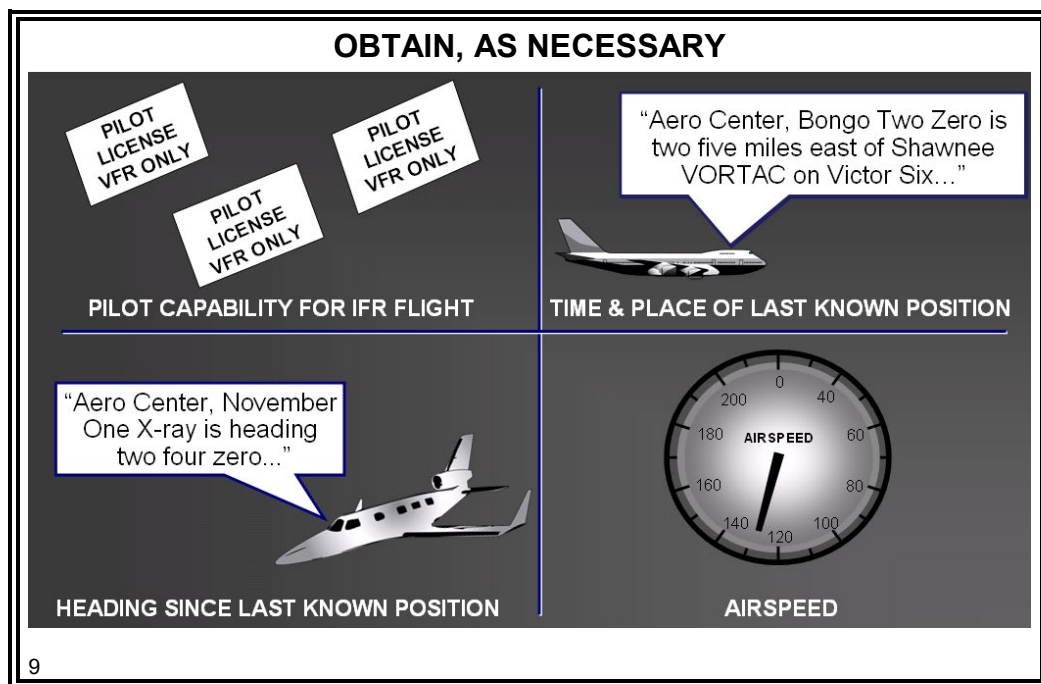
- A. Flight Service Station
- B. Control Tower
- C. Air Route Traffic Control Center

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# EMERGENCY ASSISTANCE

## Information Requirements

JO 7110.65,  
par. 10-2-1



- ⊙ Start providing assistance when enough information has been obtained upon which to act.

**NOTE:** Emergency checklists are available at all sectors.

- ⊙ Minimum information requirements:
  - Aircraft identification and type
  - Nature of emergency
  - Pilot's desires
- ⊙ After initiating action, obtain the following from the pilot, as necessary:
  - Altitude
  - Fuel remaining (in time)
  - Pilot-reported weather
  - Pilot capability for IFR flight
  - Time and place of last known position
  - Heading since last known position
  - Airspeed





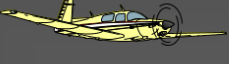

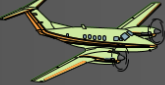

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# EMERGENCY ASSISTANCE (Continued)

## Information Requirements (Cont'd)

JO 7110.65,  
par. 10-2-1

**OBTAIN, AS NECESSARY (CONT'D)**

<p>VOR</p>  <p>ADF</p>  <p>NAVIGATION EQUIPMENT CAPABILITY</p>	<p>NAVAID SIGNALS RECEIVED</p>  <p>VISIBLE LANDMARKS</p>  <p>YELLOW MOONEY</p>  <p>PINK CESSNA 402</p>  <p>GREEN KING AIR</p>  <p>WHITE CITATION</p>  <p>AIRCRAFT COLOR</p>
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- Navigation equipment capability
- NAVAID signals received
- Visible landmarks
- Aircraft color




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# EMERGENCY ASSISTANCE (Continued)

## Information Requirements (Cont'd)

JO 7110.65,  
par. 10-2-1

**OBTAIN, AS NECESSARY (CONT'D)**

 <p>NUMBER OF PEOPLE ON BOARD</p>	<p>POINT OF DEPARTURE AND DESTINATION</p> 
 <p>EMERGENCY EQUIPMENT ON BOARD</p>	

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- Number of people on board
  - Point of departure and destination
  - Emergency equipment on board
- ⊙ Request aircraft position if:
- Pilot has **not** given this information
  - Aircraft is **not** visually sighted or displayed on radar

# EMERGENCY ASSISTANCE *(Continued)*

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## Frequency Changes

JO 7110.65,  
par. 10-2-2

- ⦿ Keep aircraft on initial contact frequency.
    - Change frequencies **only** when there is a valid reason
  - ⦿ Emergency frequencies:
    - 121.5 MHz (VHF)
    - 243.0 MHz (UHF)
- 

## Emergency Code Assignment

JO 7110.65,  
par. 5-2-7

- ⦿ Assign code 7700 to an aircraft when the pilot declares an emergency and the aircraft is **not** radar-identified.



## Phraseology

“SQUAWK MAYDAY ON 7700.”

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## Emergency Airport Recommendation

JO 7110.65,  
par. 10-2-15

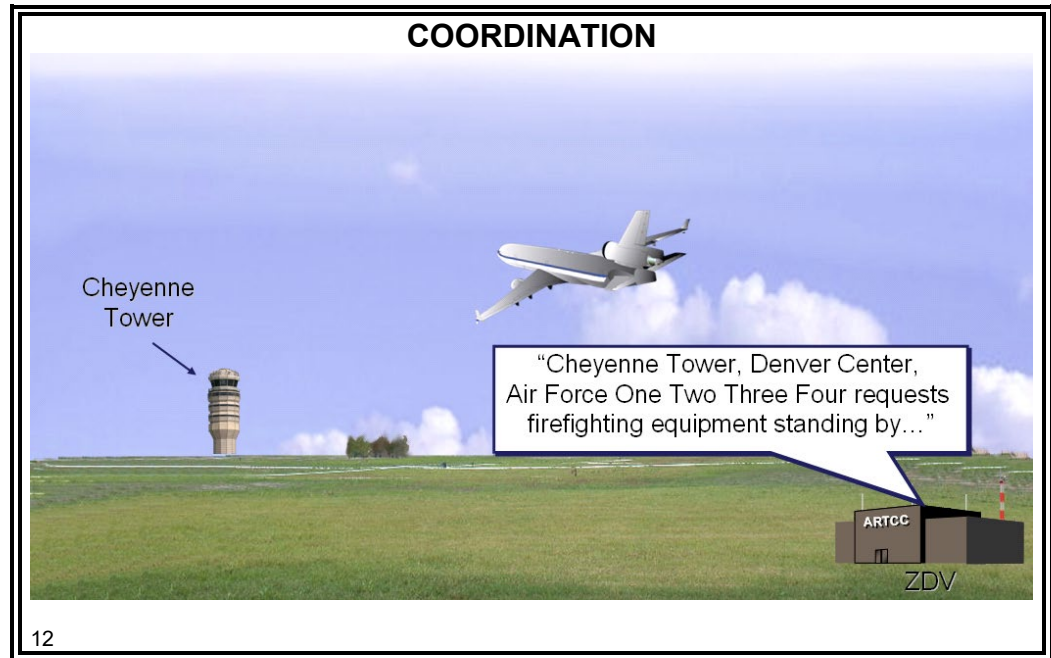
- ⦿ Consider the following factors when recommending an emergency airport:
    - Remaining fuel in relation to airport distance
    - Weather conditions
    - Airport conditions
    - NAVAID status
    - Aircraft type
    - Pilot's qualification
    - Vectoring or homing capability to the emergency airport - Information derived from any automated emergency airport information source
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# EMERGENCY ASSISTANCE *(Continued)*

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## Coordination

JO 7110.65,  
par. 10-1-5



☉ Coordinate all efforts possible to assist any aircraft believed to be:

- Overdue
- Lost
- In emergency status

**NOTE:** This list may also include any other unusual situations. Actual situations will dictate the type of coordination required.

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## EMERGENCY ASSISTANCE *(Continued)*

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### Knowledge Check

#### KNOWLEDGE CHECK

❖ **QUESTION:** The minimum initial information required to assist an inflight emergency is the aircraft identification, type aircraft, pilot's desires, and \_\_\_\_.

- A. nature of emergency
- B. fuel remaining
- C. aircraft location

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# UNUSUAL SITUATIONS

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## Unusual Situations

JO 7110.65,  
pars. 10-2-7,  
10-2-8, 10-2-18

⊙ Unusual situations may include, but are **not** limited to:

- Volcano ash clouds
  - VFR aircraft in weather difficulty
  - Bird strike
  - Other non-routine events
- 

## Emergency Locator Transmitter (ELT) Signals

JO 7110.65,  
par. 10-2-10

⊙ When an ELT is heard or reported:

- Notify the supervisor

**NOTE:** Supervisor initiates coordination.

- Obtain any pertinent information such as time, altitude, location, etc.
  - Solicit assistance of other aircraft operating in the signal area
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# OVERDUE AIRCRAFT

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## Determination

JO 7110.65,  
par. 10-3-1

- ⊙ Consider an aircraft to be overdue; initiate procedures in FAA Order JO 7110.65, Chapter 10, Section 3; and issue an ALNOT when:
    - Neither communications nor radar contact can be established and 30 minutes have passed since:
      - ETA over specified or compulsory reporting point in your area, or clearance limit in your area
      - Clearance void time
  - ⊙ If you have reason to believe an aircraft is overdue prior to 30 minutes, take appropriate action immediately.
    - Center in whose area the aircraft is first overdue/unreported will make this determination
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## Traffic Restrictions

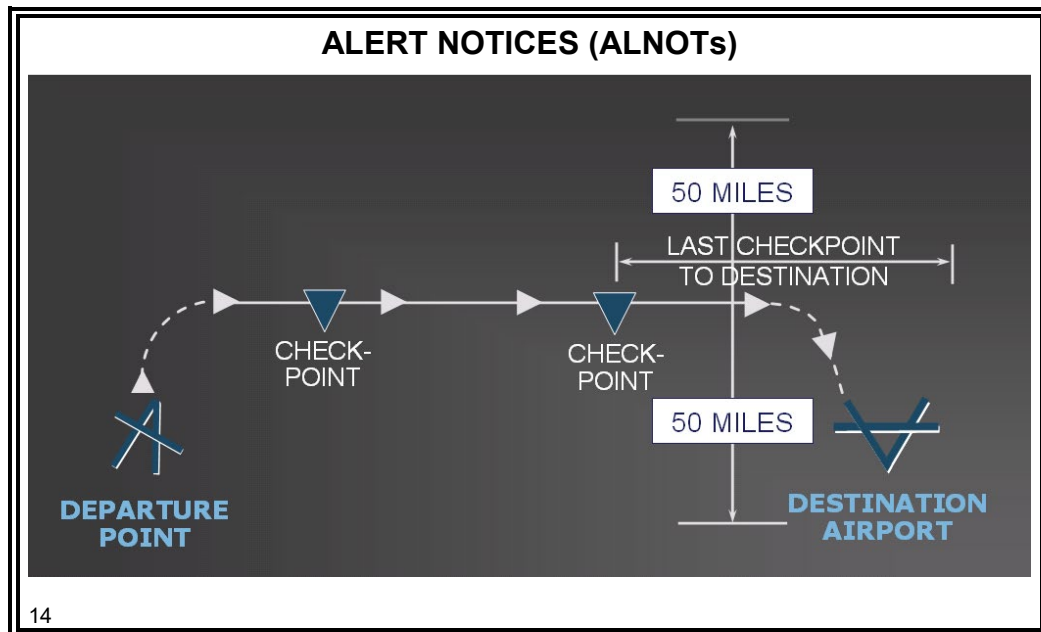
JO 7110.65,  
par. 10-4-1

- ⊙ IFR traffic which could be affected by an overdue or unreported aircraft **must** be restricted or suspended unless:
    - Radar separation is used
  - ⊙ The facility responsible **must** restrict/suspend IFR traffic for a period of 30 minutes following the applicable time listed:
    - Time at which approach clearance was delivered to pilot
    - EFC time delivered to pilot
    - Arrival time over NAVAID serving destination airport
    - Current estimate, facility or pilot, whichever is later
      - Appropriate en route NAVAID or fix
      - NAVAID serving destination airport
      - Release time and, if issued, clearance void time
-

# OVERDUE AIRCRAFT *(Continued)*

## Alert Notices (ALNOTs)

JO 7110.65,  
par. 10-3-4



- ⦿ In addition to routing to the regional office operations center for the area in which the facility is located, issue an ALNOT to all ARTCCs:
  - 50 miles either side of the route of flight from the last reported position to the destination

# OVERDUE AIRCRAFT *(Continued)*

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## **ALNOT Cancellation**

JO 7110.65,  
par. 10-3-7

- ⊙ An ALNOT is cancelled when either:
    - Aircraft has been located, or
    - Search has been abandoned
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## **Traffic Resumption**

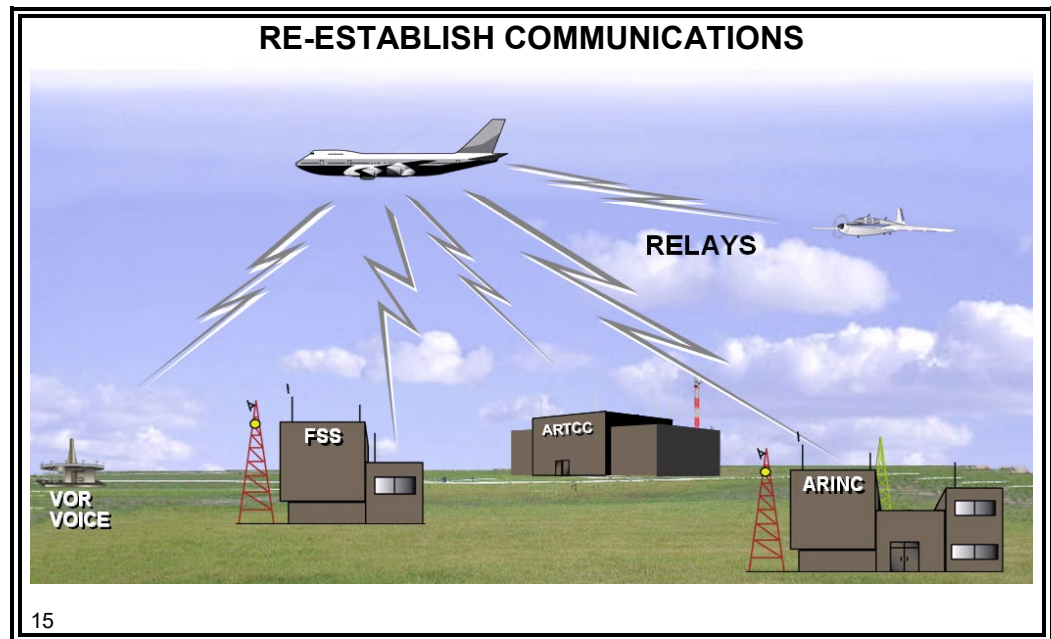
JO 7110.65,  
par. 10-4-3

- ⊙ Normal air traffic control is resumed after the 30-minute traffic suspension has expired if operators or pilots of other aircraft concur.
    - Concurrence **must** be maintained for 30 minutes after the suspension period has expired
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# COMMUNICATIONS FAILURE

## Controller Actions

JO 7110.65,  
par. 10-4-4



- ⦿ Air traffic control is based on anticipated pilot action.
- ⦿ Use all appropriate means available to re-establish communications with the aircraft, including:
  - NAVAID voice features
  - Flight Service Stations
  - Other aircraft
  - Aeronautical Radio Incorporated (ARINC)
  - Emergency frequency, if warranted

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# COMMUNICATIONS FAILURE *(Continued)*

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## Controller Actions (Cont'd)

JO 7110.65,  
par. 10-4-4

- ⊙ Attempt to re-establish communications by requesting aircraft to:
  - Make turns to acknowledge clearances and answer questions
  - Reply with transponder change to acknowledge clearances and answer questions
    - Squawk ident
    - Squawk 7600
      - “RDOF” blinks in Field E of the data block
    - Squawk other appropriate stratum code
    - Squawk standby
      - Allow sufficient time to ensure change was caused by pilot action

**NOTE:** The Radar Associate Controller may also coordinate with other controllers to re-establish communications.

- ⊙ If radio communications have **not** been established or re-established after five minutes, consider the aircraft’s activity to be possibly suspicious.
    - Notify your supervisor who will give you further instructions based on requirements in FAA JO 7610.4, Chapter 7, Hijacked/Suspicious Aircraft Reporting and Procedures
-

# COMMUNICATIONS FAILURE *(Continued)*

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## Pilot Actions

JO 7110.65,  
par. 10-4-4;  
AIM, pars. 6-4-1  
thru 6-4-3

- ⊙ Expect the pilot to:
  - Adjust the transponder to reply Mode 3/A code 7600
  - Proceed VFR and land as soon as practicable if VFR conditions:
    - Exist when radio failure occurs
    - Are encountered after the failure
  - Proceed IFR via:
    - Routing last assigned
    - Direct to fix, route, or airway specified in vector clearance
      - When radio failure occurs during a vector
    - Routing ATC advised to expect in a further clearance
      - In the absence of an assigned route
    - Route filed in flight plan
      - If route was **not** assigned and ATC has **not** advised a route to expect
  - Maintain the highest of the following altitudes for the route segment being flown:
    - Last assigned
    - Minimum altitude/flight level for IFR operations
    - Altitude/flight level ATC advised to expect
  - Depart clearance limit
    - If an approach fix, as close as possible to either:
      - Expect Further Clearance (EFC) time, or
      - Estimated Time of Arrival (ETA)
    - If other than an approach fix, at EFC or upon arrival at the fix to commence approach as close as possible to the ETA
  - Attempt to re-establish radio contact:
    - With FSS or ARINC
    - On previously assigned frequency
      - Monitor the NAVAID voice feature

## COMMUNICATIONS FAILURE *(Continued)*

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### Knowledge Check

#### KNOWLEDGE CHECK

❖ **QUESTION:** An aircraft that has experienced communication failure is expected to adjust the transponder to reply Mode 3/A code \_\_\_\_.

- A. 7700
- B. 7600
- C. 1277

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#### KNOWLEDGE CHECK

❖ **QUESTION:** An aircraft operating on an IFR flight plan in VFR conditions experiencing a loss of communications shall \_\_\_\_.

- A. continue on the flight plan route
- B. descend to the MEA while VFR
- C. continue VFR and land

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# IN CONCLUSION

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## Lesson Review

### LESSON REVIEW

**The following topics were covered in this lesson:**

- General emergency information
- Emergency situations
- Emergency assistance
- Unusual situations
- Overdue aircraft
- Communications failure



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## End-of- Lesson Test

### END-OF-LESSON TEST

**Emergencies**



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