



**Federal Aviation
Administration**


Initial En Route Qualification Training

**Instructor
Lesson 38
Emergencies**

Course 50148001

LESSON PLAN DATA SHEET

COURSE NAME:	INITIAL EN ROUTE QUALIFICATION TRAINING
COURSE NUMBER:	50148001
LESSON TITLE:	EMERGENCIES
DURATION:	2+00 HOURS
DATE REVISED:	2022-02
VERSION:	V.2022-02
REFERENCE(S):	FAA ORDER JO 7110.65, AIR TRAFFIC CONTROL; AERONAUTICAL INFORMATION MANUAL (AIM)
HANDOUT(S):	NONE
EXERCISE(S)/ ACTIVITY(S):	NONE
END-OF-LESSON TEST:	YES (<i>REFER TO ELT38.PDF</i>)
PERFORMANCE TEST:	NONE
MATERIALS:	NONE
OTHER PERTINENT INFORMATION:	NONE

 **NOTE:** *As you prepare for this lesson, recall and be prepared to talk about examples and personal experiences that illustrate or explain the teaching points in the lesson.*

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INTRODUCTION


**Gain
Attention**




Initial En Route Qualification Training

Lesson 38 Emergencies

V.2022-02
Presented by
FAA Academy
Air Traffic Division



Federal Aviation
Administration



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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)*

Opening Scenario



EMERGENCIES

Manchester Ringway International Airport - EGCC

29/4/07

09:15 am

Movie source: Simon Lowe, 2009
2

 **NOTE:** Click to play the video.

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.

Purpose

This lesson covers specific procedures for emergency situations.

INTRODUCTION *(Continued)*


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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 **NOTE:** Teach from graphic.

GENERAL EMERGENCY INFORMATION

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.

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.

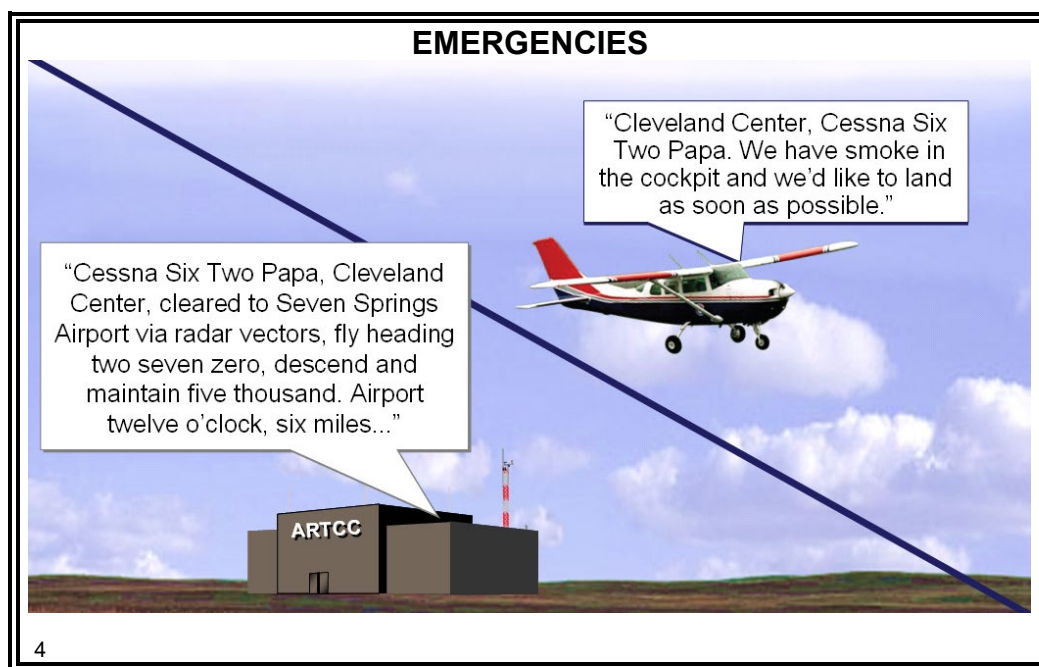


Urgency is a condition of being concerned about safety and of requiring timely but **not** immediate assistance—a potential distress condition.

GENERAL EMERGENCY INFORMATION *(Continued)*

Initial Communication Key Words

JO 7110.65,
par. 10-1-1



 **NOTE:** Click twice to show dialogue.

- ⦿ “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.

GENERAL EMERGENCY INFORMATION *(Continued)*

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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👉 **NOTE:** Click once to show answer.

ANSWER: B

EMERGENCY SITUATIONS

Emergency Determination

JO 7110.65,
par. 10-2-5



EMERGENCY EXAMPLE – ABANDONING AIRCRAFT



⦿ 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)*

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

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

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
-

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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☞ **NOTE:** Click twice to show dialogue.

- ☉ 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)*

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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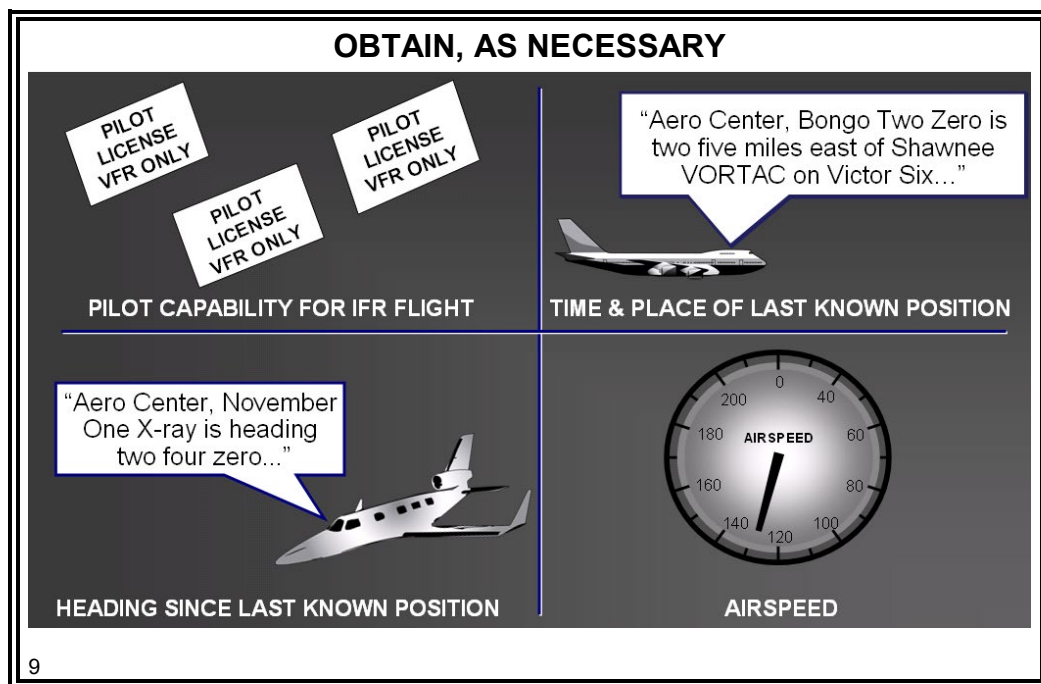
☞ **NOTE:** Click once to show answer.

ANSWER: C

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>AIRCRAFT COLOR</p>  <p>YELLOW MOONEY PINK CESSNA 402 GREEN KING AIR WHITE CITATION</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)*

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



Phraseology

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

“SQUAWK MAYDAY ON 7700.”

Emergency Airport Recommendation

JO 7110.65,
par. 10-2-15

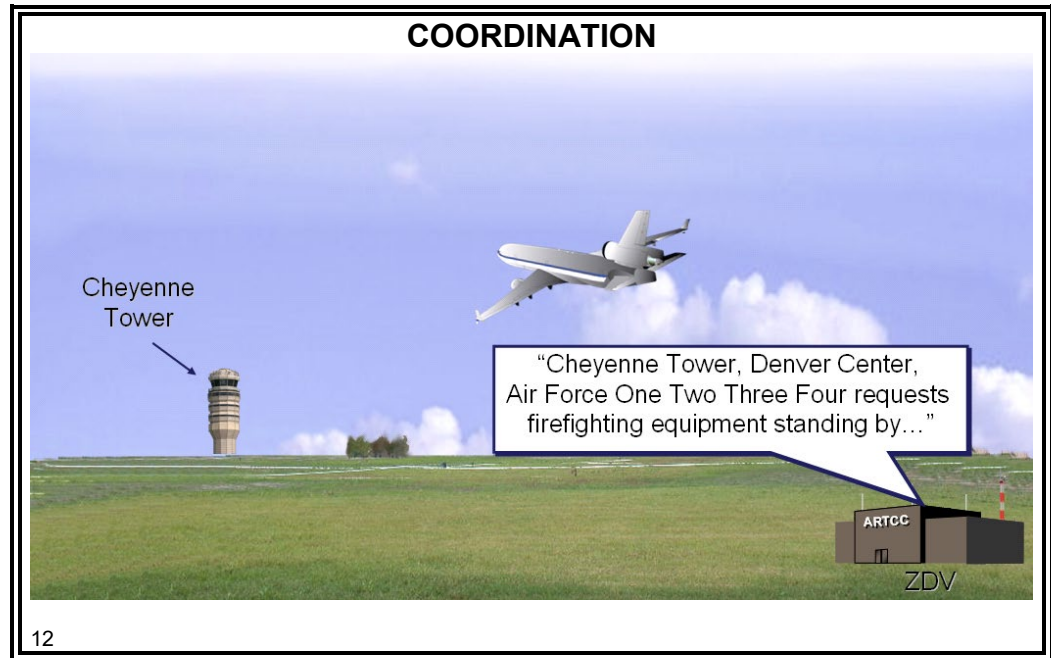
- ⦿ Consider the following factors when recommending an emergency airport:
 - Remaining fuel in relation to airport distance
 - Weather conditions
 - Airport conditions
 - NAVAID status
 - Aircraft type
 - Pilot's qualification
 - Vectoring or homing capability to the emergency airport - Information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

☞ **NOTE:** Examples may include ERIDS or the AI function on the radar display.

EMERGENCY ASSISTANCE *(Continued)*

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.

EMERGENCY ASSISTANCE (Continued)

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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☞ **NOTE:** Click once to show answer.

ANSWER: A

UNUSUAL SITUATIONS

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
-

OVERDUE AIRCRAFT

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
-

Traffic Restrictions

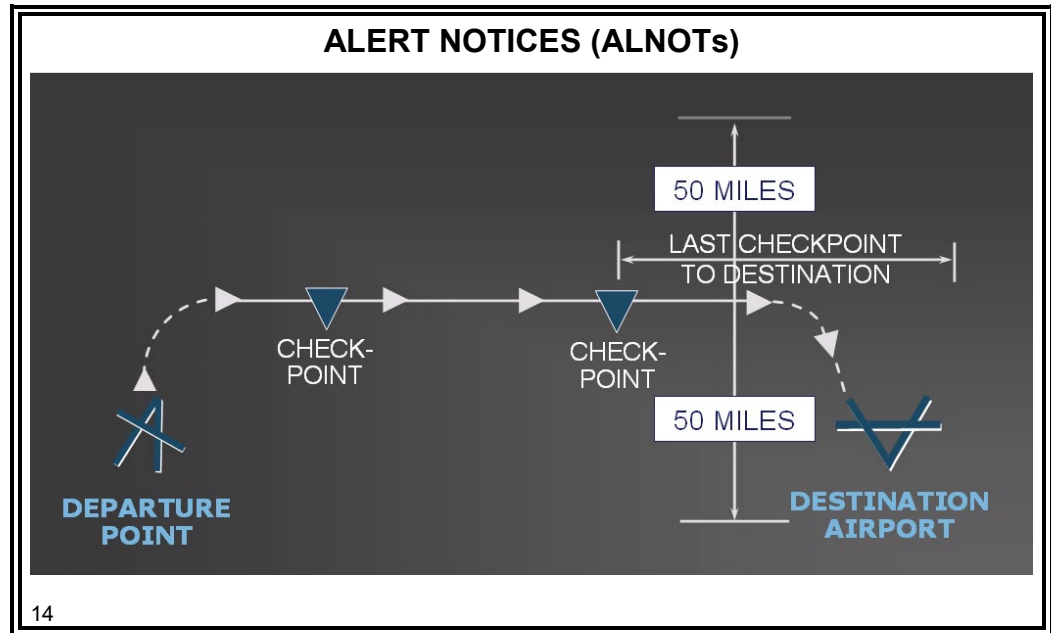
JO 7110.65,
par. 10-4-1

- ⊙ 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)*

ALNOT Cancellation

JO 7110.65,
par. 10-3-7

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

Traffic Resumption

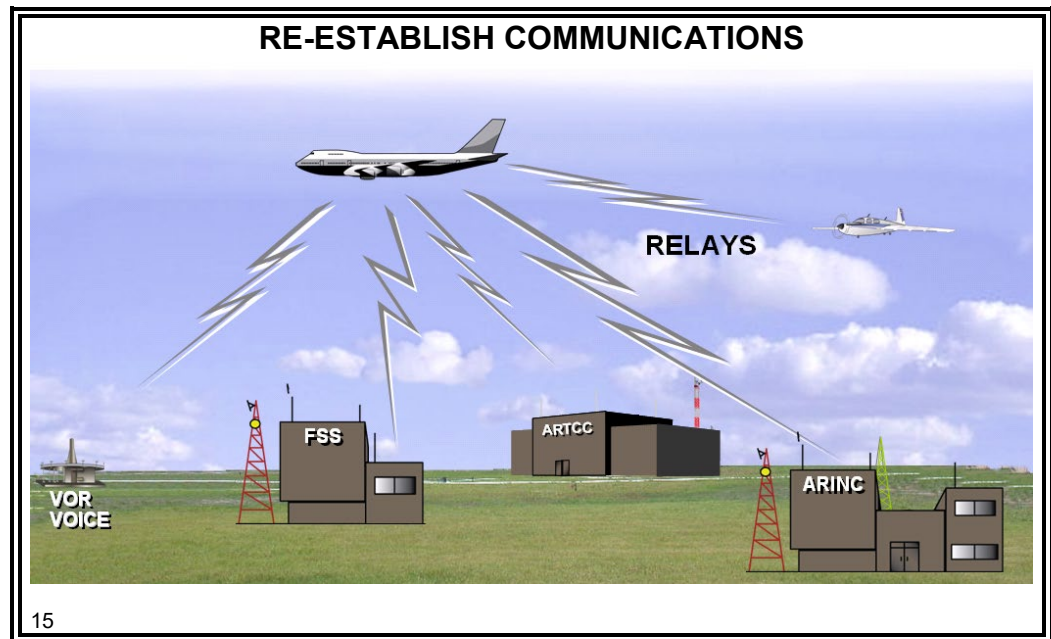
JO 7110.65,
par. 10-4-3

- ⊙ 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
-

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)*

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)*

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)*

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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☞ **NOTE:** Click once to show answer.

ANSWER: B



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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☞ **NOTE:** Click once to show answer.

ANSWER: C

IN CONCLUSION

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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 **NOTE:** Teach from graphic. Review and elaborate briefly on the points on the slide.

End-of-Lesson Test



END-OF-LESSON TEST

Emergencies



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