Federal Aviation Administration

55054001 EN ROUTE RADAR ASSOCIATE CONTROLLER TRAINING PART A: BASIC CONCEPTS

Lesson 10: Lost Communications Procedures

Version: 1.0 2022.08

INSTRUCTOR LESSON PLAN

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LESSON PLAN DATA SHEET

Course Name	En Route Radar Associate Controller Training Part A: Basic Concepts
Course Number	55054001
Lesson Title	Lost Communications Procedures
Duration	1 Hour, 15 minutes (Includes lesson and ELT)
Version	1.0 2022.08
Reference(s)	JO 7110.65, Air Traffic Control; JO 7610.4, Special Operations; Aeronautical Information Manual; 14 CFR Part 91
Prerequisites	NONE
Handout(s)	NONE
Exercise / Activity	NONE
Scenario	NONE
Assessments	YES - Written *(Refer to ELT01_L10, print prior to class)*
Materials and Equipment	⊙ Pencil and/or pen
Other Pertinent Information	⊙ **Ensure lesson materials are downloaded to the classroom computer** ⊙ Course 57845, LOST COMMUNICATIONS PROCEDURES, or current course, is available as supplemental training for this lesson ⊙ This lesson is based on ERAM EAE410 ⊙ The lesson has been reviewed and reflects current orders and manuals as of April 2022

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

LESSON ICON LEGEND

	Description
	The Activity icon indicates an exercise, lab, or hands-on activity.
	The Discussion Question icon signals a discussion question to be asked to the students.
	The Handout icon indicates a handout is to be distributed to the students.
	The Instructor Note icon is in hidden text and indicates text that is for the instructor only.
	The Multimedia icon indicates a video or audio clip is in the presentation.
	The Phraseology icon indicates that phraseology is in the content.
	The WBT icon indicates a component of web-based training.
	The Click icon indicates a PPT slide with click-based functionality to present additional information.
	The Definition icon indicates a published definition.

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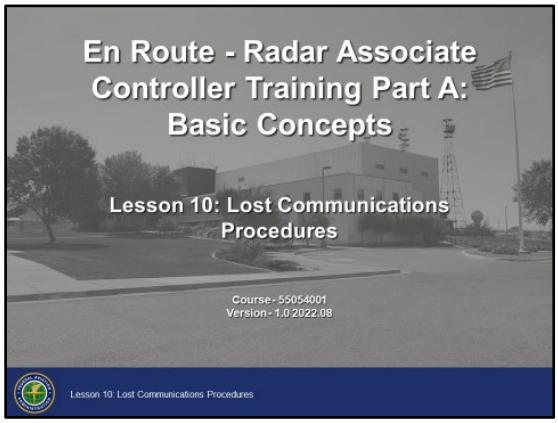
LESSON INTRODUCTION

Overview

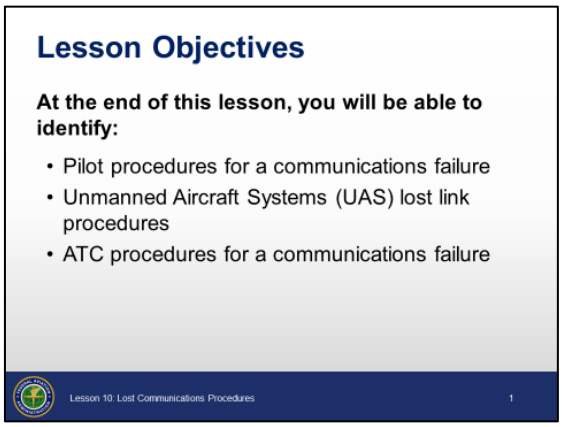


Overview

Understanding pilot and ATC procedures during communication failure is important for controllers to effectively separate aircraft and maintain an orderly flow of traffic. This lesson also includes procedures for handling communication failure for Unmanned Aircraft Systems (UAS). These procedures are necessary to provide the best possible service based on anticipated actions.

LESSON INTRODUCTION *(CONT'D)*

Lesson Objectives



Objectives

Review the lesson objectives.

⊙ At the end of this lesson, you will be able to identify:

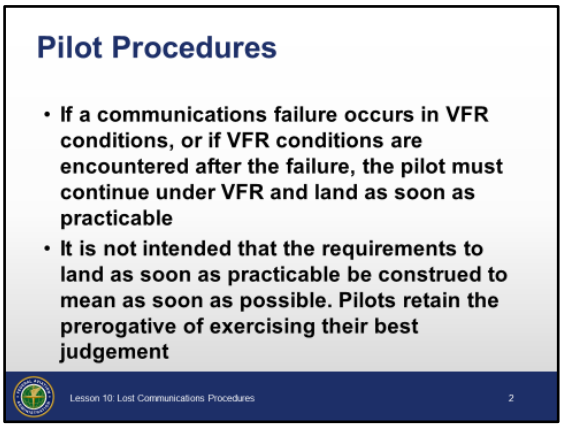
- Pilot procedures for a communications failure
- Unmanned Aircraft Systems (UAS) lost link procedures
- ATC procedures for a communications failure

NOTE: There will be a graded end-of-lesson test upon completion of the lesson. The passing score is 70%. If you do not achieve a score of 70%, you will be provided study time and one retake of an alternate end-of-lesson test.

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE

Pilot Procedures

AIM, par. 6-4-1



Pilot Procedures

- If a communications failure occurs in VFR conditions, or if VFR conditions are encountered after the failure, the pilot must continue under VFR and land as soon as practicable
- It is not intended that the requirement to land as soon as practicable be construed to mean as soon as possible. Pilots retain the prerogative of exercising their best judgment and are not required to land at:
  - Unauthorized airports
  - Airports unsuitable for the type of aircraft flown
  - Airports only minutes short of their intended destination

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

IFR Aircraft in VFR Conditions

AIM, pars. 6-4-1 through 6-4-2

IFR Aircraft in VFR Conditions

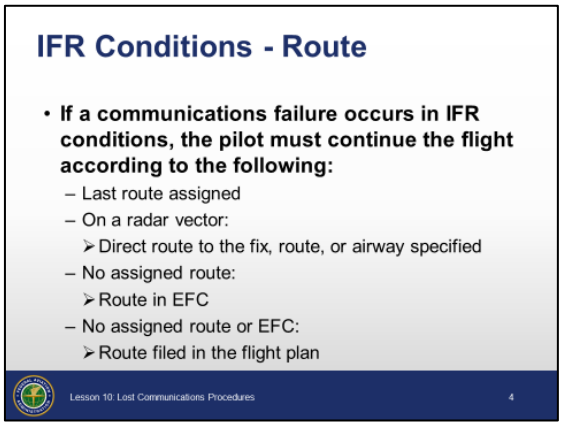
⊙ If a communications failure occurs in VFR conditions, the pilot must:

- Continue the flight under VFR conditions
- Squawk Code 7600
- Land as soon as practicable

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

IFR Conditions - Route

AIM, par. 6-4-1



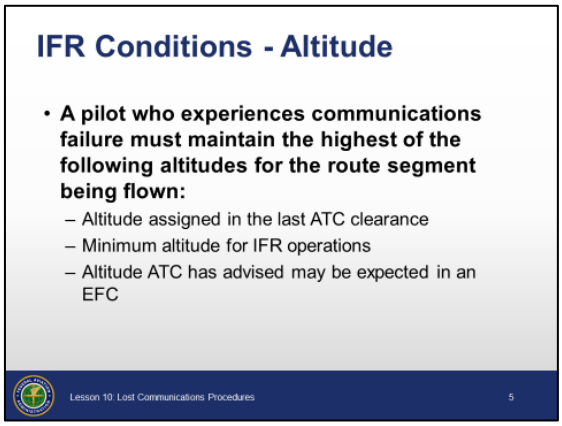
IFR Conditions - Route

- ⊙ If a communications failure occurs in IFR conditions, the pilot must continue the flight according to the following:
  - Last route assigned
  - On a radar vector:
    - Direct route to the fix, route, or airway specified
  - No assigned route:
    - Route in Expect Further Clearance (EFC)
  - No assigned route or EFC:
    - Route filed in the flight plan

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

IFR Conditions - Altitude

AIM, par. 6-4-1



IFR Conditions - Altitude

⊙ A pilot who experiences communications failure must maintain the highest of the following altitudes for the route segment being flown:

- Altitude assigned in the last ATC clearance
- Minimum altitude for IFR operations
- Altitude ATC has advised may be expected in an EFC

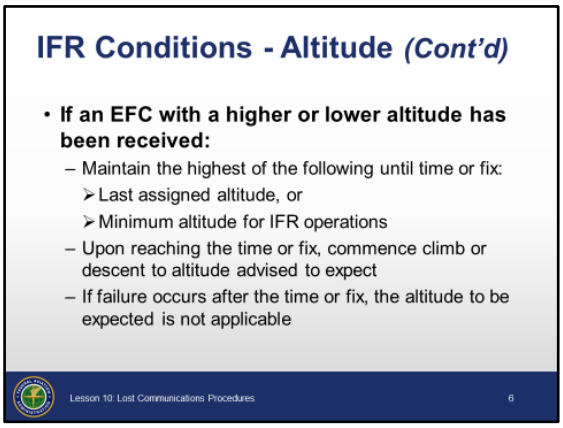
NOTE: The intent of the rule is that a pilot who has experienced two-way radio failure should select the appropriate altitude for the particular route segment being flown. The pilot should also make the necessary altitude adjustments for subsequent route segments.

Example: A pilot experiencing two-way radio failure at an assigned altitude of 7,000' is cleared along a direct route which will require a climb to a minimum IFR altitude of 9,000', should climb to reach 9,000' at the time or place where it becomes necessary.

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

IFR Conditions - Altitude (Cont'd)

AIM, par. 6-4-1



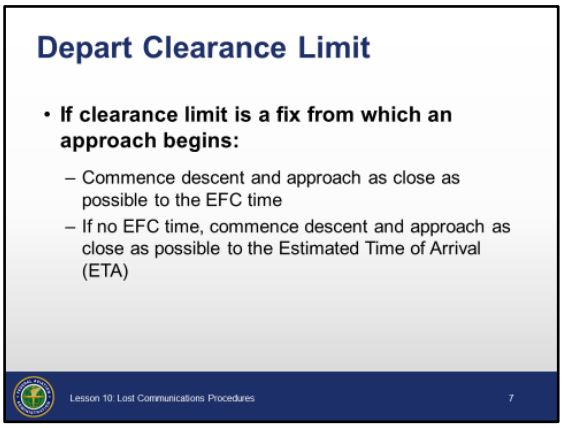
⊙ If an EFC with a higher or lower altitude has been received:

- Maintain the highest of the following until the time or fix:
  - Last assigned altitude, or
  - Minimum altitude for IFR operations
- Upon reaching the time or fix, commence climb or descent to altitude advised to expect
- If failure occurs after the time or fix, the altitude to be expected is not applicable

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

IFR Conditions - Depart Clearance Limit

AIM, par. 6-4-1



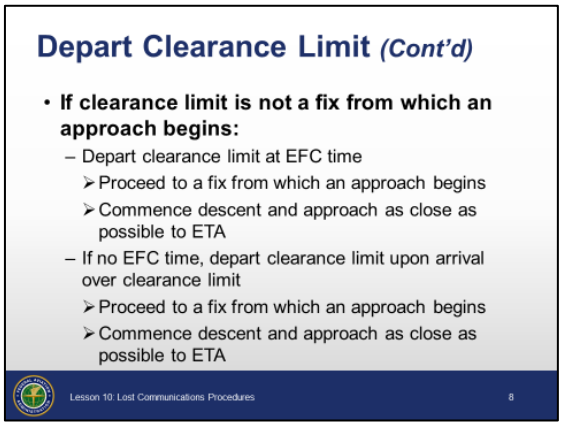
Depart Clearance Limit

- If clearance limit is a fix from which an approach begins:
  - Commence descent and approach as close as possible to the EFC time
  - If no EFC time, commence descent and approach as close as possible to the Estimated Time of Arrival (ETA)

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

IFR Conditions - Depart Clearance Limit (Cont'd)

AIM, par. 6-4-1



⊙ If clearance limit is not a fix from which an approach begins:

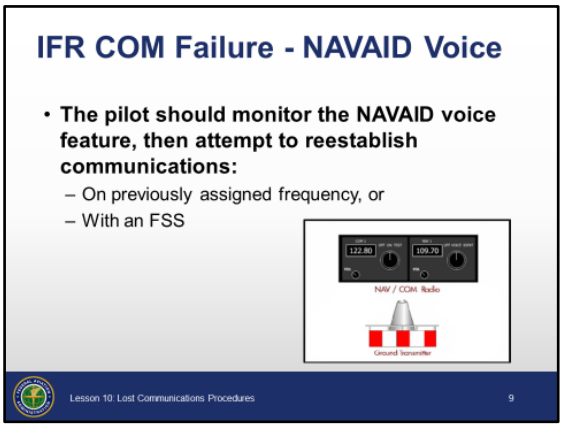
- Depart clearance limit at EFC time
  - Proceed to a fix from which an approach begins
  - Commence descent and approach as close as possible to the ETA
- If no EFC time, depart clearance limit upon arrival over clearance limit
  - Proceed to a fix from which an approach begins
  - Commence descent and approach as close as possible to the ETA

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

IFR COM Failure - NAVAID Voice

AIM, par. 6-4-3

JO 7110.65, PCG



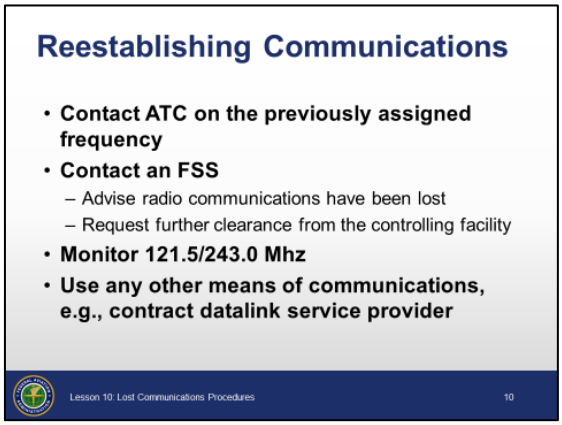
IFR COM Failure - NAVAID Voice

- The pilot should monitor the NAVAID voice feature, then attempt to reestablish communications:
  - On previously assigned frequency, or
  - With an FSS

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Reestablishing Communications

AIM, par. 6-4-3



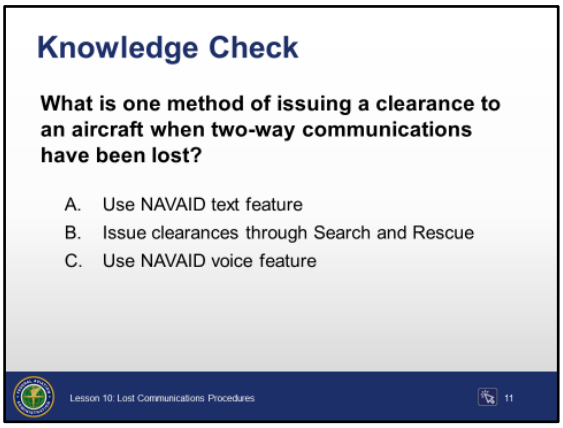
Reestablishing Communications

- Contact ATC on the previously assigned frequency
- Contact an FSS
  - Advise radio communications have been lost
  - Request further clearance from the controlling facility
- Monitor 121.5/243.0 MHz
- Use any other available means of communications, e.g., contract datalink service provider

NOTE: There is no priority on which action should be attempted first. If the capability exists, the pilot should do all at the same time.

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check

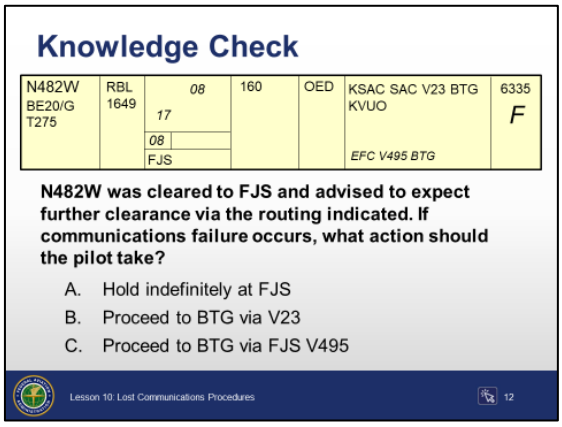


Question: What is one method of issuing a clearance to an aircraft when two-way radio communications have been lost?

Answer: *C. Use NAVAID voice feature*

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check

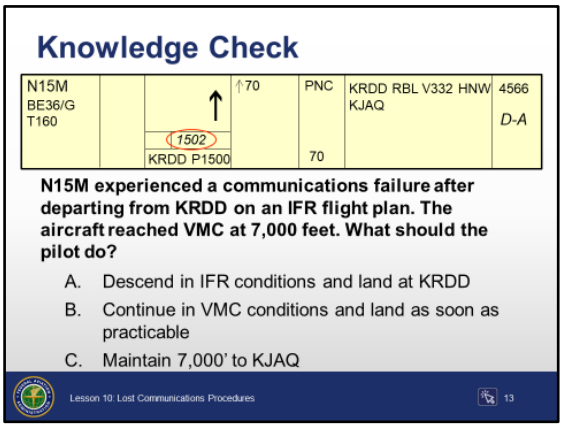


Question: N482W was cleared to FJS and advised to expect further clearance via the routing indicated. If communications failure occurs, what action should the pilot take?

Answer: *C. Proceed to BTG via FJS V495*

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check

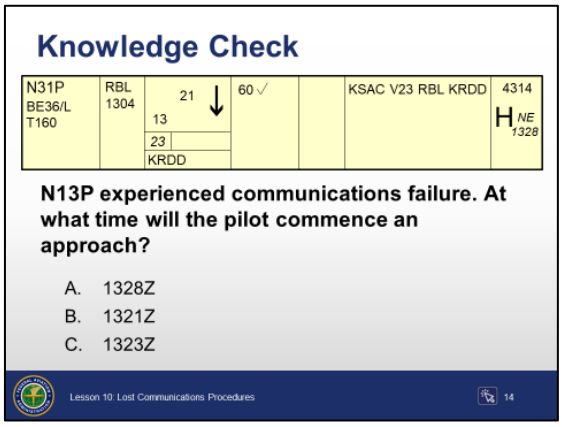


Question: N15M experienced a communications failure after departing from KRDD on an IFR flight plan. The aircraft reached VMC at 7,000'. What should the pilot do?

Answer: *B. Continue in VMC and land as soon as practicable*

PILOT PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check



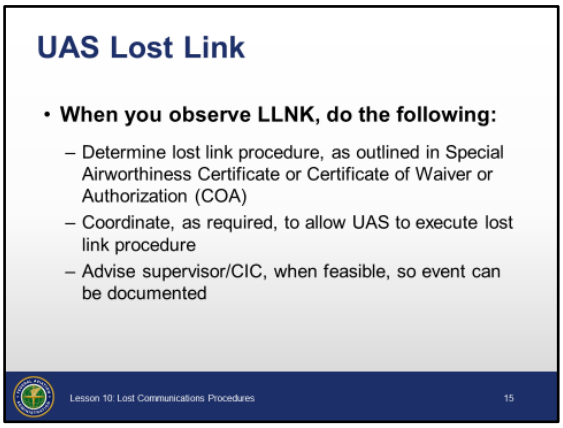
Question: N31P experienced communications failure. At what time will the pilot commence an approach?

Answer: *A. 1328Z*

UNMANNED AIRCRAFT SYSTEMS (UAS) LOST LINK PROCEDURES

Unmanned Aircraft Systems (UAS) Lost Link

JO 7110.65, par. 5-2-6



Unmanned Aircraft Systems (UAS) Lost Link

⊙ UAS may squawk 7400 when experiencing a lost link

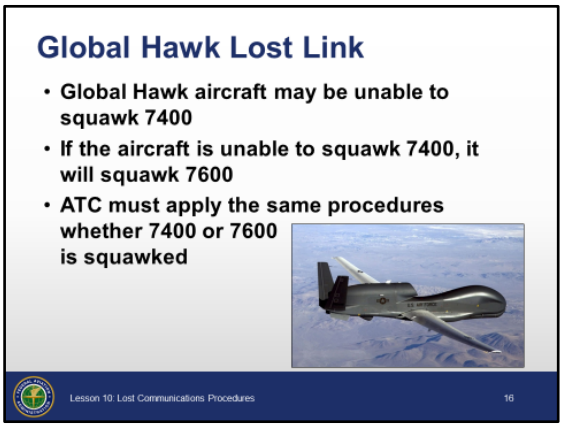
- When you observe LLNK displayed in the FDB, do the following:
  - Determine lost link procedure, as outlined in Special Airworthiness Certificate or Certificate of Waiver or Authorization (COA)
  - Coordinate, as required, to allow UAS to execute lost link procedure
  - Advise supervisor/CIC, when feasible, so event can be documented
- The available lost link procedure should, at a minimum, include:
  - Route of flight
  - Orbit points
  - Altitudes
  - Communications procedures
  - Preplanned flight termination points

NOTE: Lost link procedures are dependent upon airframe and operation and must be made available to ATC personnel at positions responsible for UAS.

UAS LOST LINK PROCEDURES *(CONT'D)*

Global Hawk Lost Link

JO 7110.65, par. 5-2-6

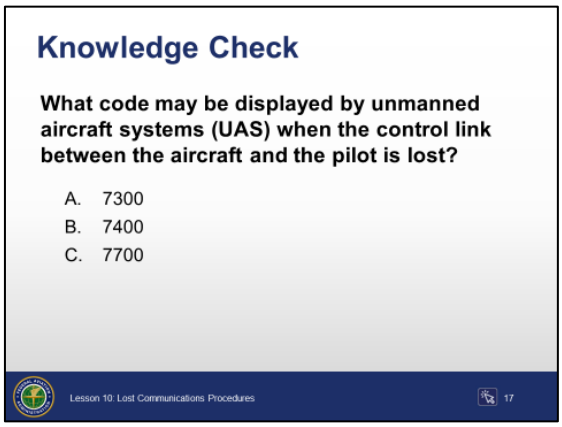


Global Hawk Lost Link

- Global Hawk aircraft may be unable to squawk 7400
  - If the aircraft is unable to squawk 7400, it will squawk 7600
- ATC must apply the same procedures whether 7400 or 7600 is squawked

UAS LOST LINK PROCEDURES *(CONT'D)*

Knowledge Check



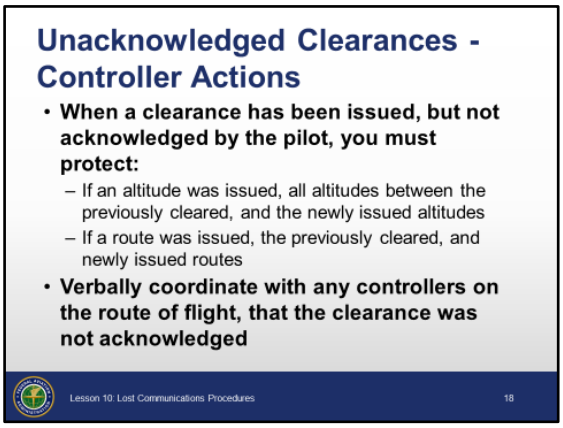
Question: What code may be displayed by unmanned aircraft systems (UAS) when the control link between the aircraft and the pilot is lost?

Answer: B. 7400

ATC PROCEDURES FOR COMMUNICATIONS FAILURE

Unacknowledged Clearances - Controller Actions

JO 7110.65, par. 2-4-3



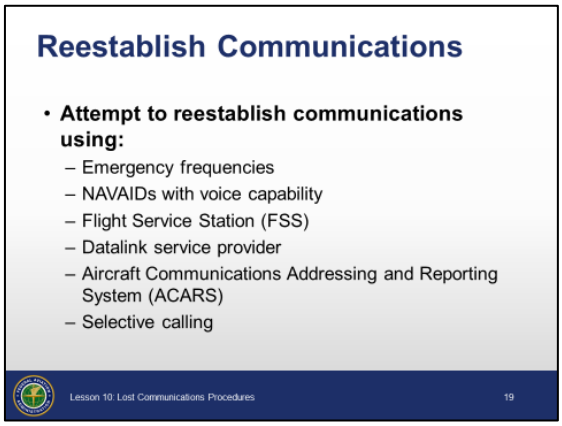
Unacknowledged Clearances - Controller Actions

- When a clearance has been issued, but not acknowledged by the pilot, you must protect:
  - If an altitude was issued, all altitudes between the previously cleared, and the newly issued altitudes
  - If a route was issued, the previously cleared, and the newly issued routes
- Verbally coordinate with any controllers on the route of flight, that the clearance was not acknowledged

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Reestablish Communica-tions - Controller

JO 7110.65, par. 10-4-4



Reestablish Communications

⊙ Attempt to reestablish communications using any of the following:

- Emergency frequencies
- NAVAIDs with voice capability
- Flight Service Station (FSS)
- Datalink service provider
- Aircraft Communications Addressing and Reporting System (ACARS)
- Selective Calling (SELCAL)

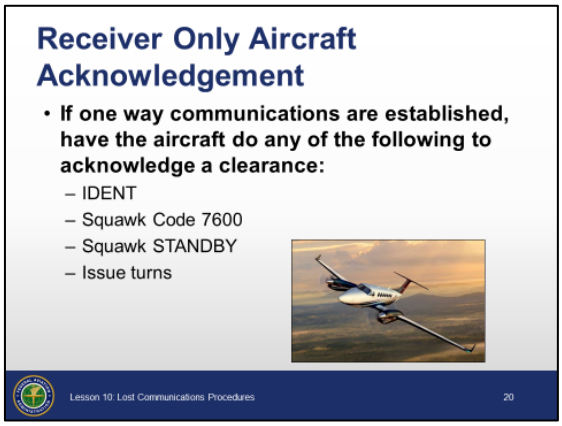
NOTE: SELCAL and ACARS are systems to alert a suitably equipped individual aircraft that a ground station is attempting to communicate with it.

NOTE: Contact the previous or subsequent controllers to have them attempt to switch the aircraft to your frequency.

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Receiver Only Aircraft Acknowledge-ment

JO 7110.65, par. 10-4-4



Receiver Only Aircraft Acknowledgment

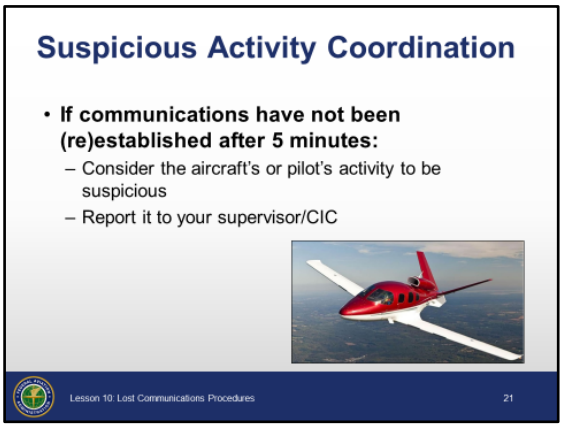
⊙ If one way communications are established, have the aircraft do any of the following to acknowledge a clearance:

- IDENT
- Squawk Code 7600
- Squawk STANDBY
- Issue a turn

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Suspicious Activity Coordination

JO 7110.65, par. 10-4-4



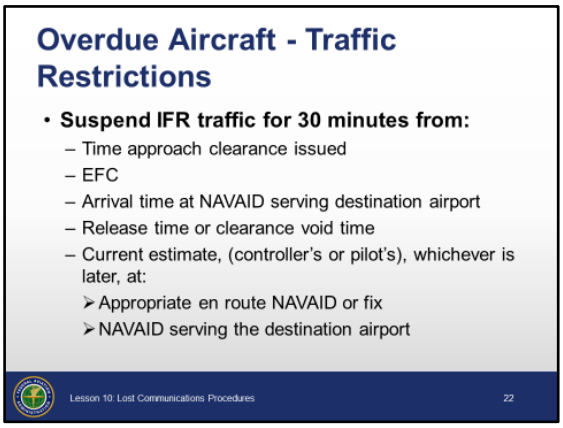
Suspicious Activity Coordination

- If communications have not been (re)established after 5 minutes:
  - Consider the aircraft's or pilot's activity to be suspicious
  - Report it to your supervisor/CIC

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Overdue Aircraft

JO 7110.65, par. 10-4-1



Traffic Restrictions

⊙ Suspend IFR traffic for 30 minutes if communications are lost and the aircraft is no longer observed on radar, from:

- Time at which approach clearance was delivered
- EFC time
- Arrival time over the NAVAID serving the destination airport
- Release time or if issued, clearance void time
- Current estimate, (controller's or pilot's), whichever is later, at:
  - Appropriate en route NAVAID or fix, *and*
  - NAVAID serving the destination airport

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Overdue Aircraft (Cont'd)

JO 7110.65, par. 10-4-2

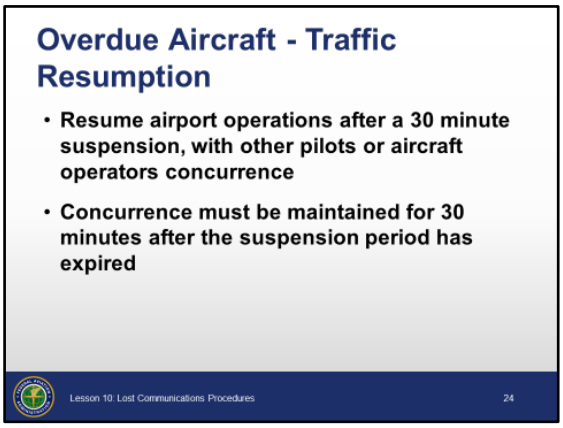
Lighting Requirements

- At nontower or non-FSS locations, request airport management to light all:
  - Runway lights
  - Approach lights
  - Other required airport lighting systems
- Lighting requirements begin
  - 30 minutes before the ETA of the aircraft
- Lighting requirements end
  - When aircraft has been located, or
  - 30 minutes after its fuel supply is estimated to be exhausted

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Overdue Aircraft (Cont'd)

JO 7110.65, par. 10-4-3

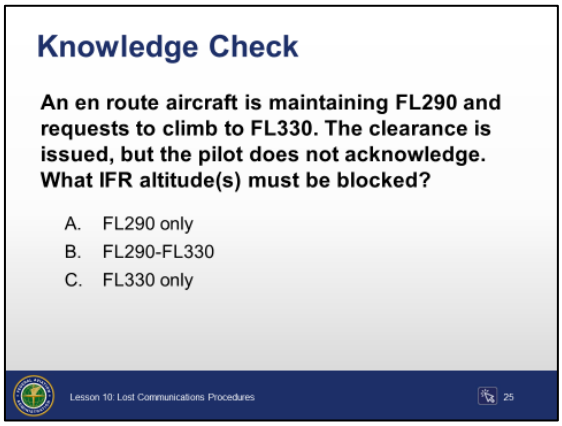


Traffic Resumption

- Resume airport operations after a 30 minute suspension, with other pilots or aircraft operators concurrence
- Concurrence must be maintained for a period of 30 minutes after the suspension period has expired

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check

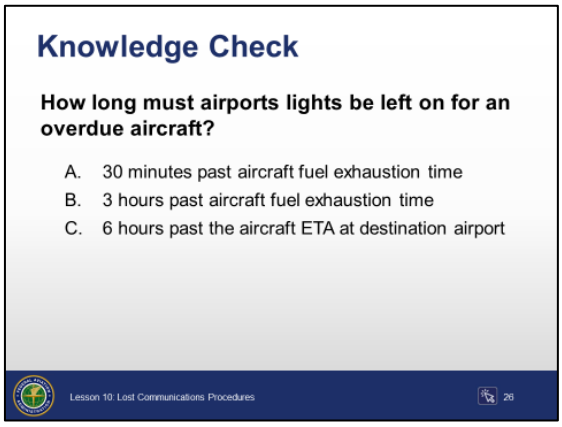


Question: An en route aircraft is maintaining FL290 and requests to climb to FL330. The clearance is issued, but the pilot does not acknowledge. What IFR altitude(s) must be blocked?

Answer: *B. FL290-FL330*

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check

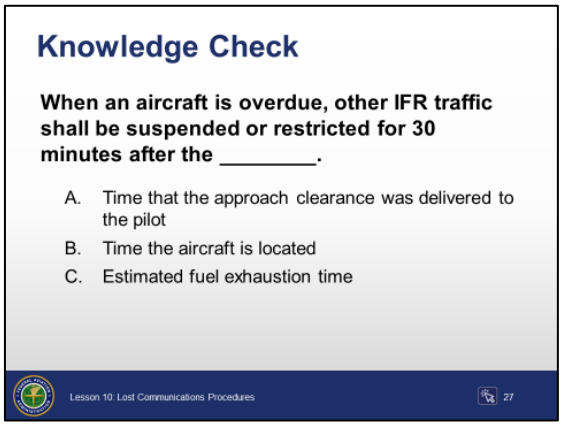


Question: How long must airport lights be left on for an overdue aircraft?

Answer: *A. 30 minutes past aircraft fuel exhaustion time*

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check

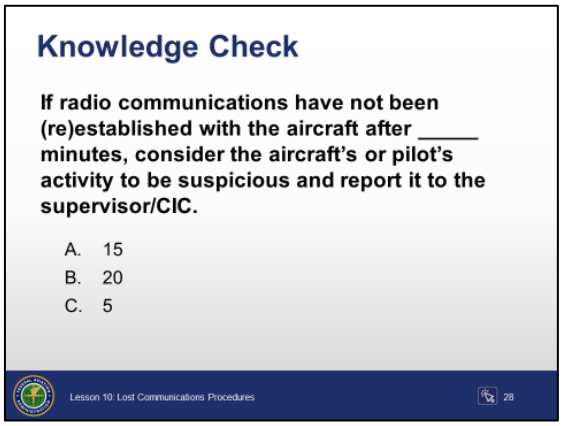


Question: When an aircraft is overdue, other IFR traffic shall be suspended or restricted for 30 minutes after the _____.

Answer: *A. Time that the approach clearance was delivered to the pilot*

ATC PROCEDURES FOR COMMUNICATIONS FAILURE *(CONT'D)*

Knowledge Check

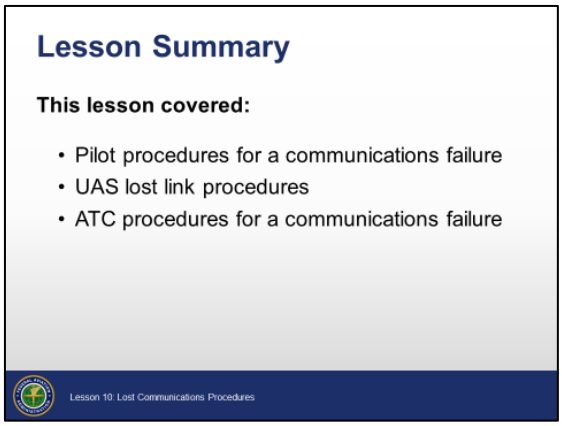


Question: If radio communications have not been (re)established with the aircraft after _____ minutes, consider the aircraft's or pilot's activity to be suspicious and report it to the supervisor/CIC.

Answer: *C. 5*

CONCLUSION

Lesson Summary



Review and elaborate briefly on the following topics. Ask students if they have questions about any of the concepts covered in the lesson.

Summary

- Pilot procedures for a communications failure
  - IFR aircraft in VFR Conditions
  - IFR aircraft in IFR Conditions
    - Route
    - Altitude
    - Depart clearance limit
    - NAVAID voice
    - Reestablishing communications
- UAS lost link procedures
  - Code 7400
  - Procedures
    - Route
    - Orbit points
    - Altitudes
    - Communications
  - Global Hawk procedures
    - Cannot squawk 7400
    - Will squawk radio failure - 7600

Continued on next page

CONCLUSION *(CONT'D)*

Lesson Summary (Cont'd)

- ATC procedures for a communications failure
  - Unacknowledged clearances
  - Reestablish communications
  - Receiver only aircraft
  - Suspicious activity coordination
  - Overdue aircraft

Hand out and administer the end of lesson test. Provide feedback on missed items, including why particular answers are correct, as well as why some responses are incorrect.