Federal Aviation Administration

Initial En Route Qualification Training

Instructor
Lesson 04
Radio and Interphone Procedures

Course 50148001

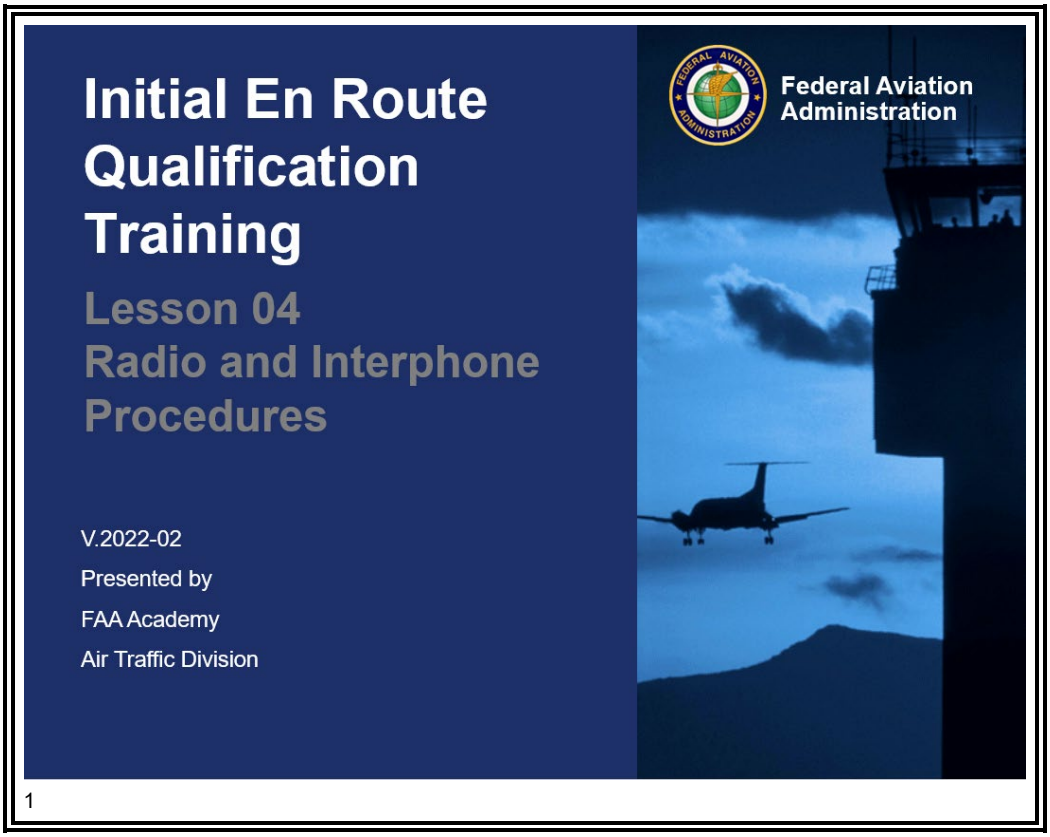
LESSON PLAN DATA SHEET

COURSE NAME:	INITIAL EN ROUTE QUALIFICATION TRAINING
COURSE NUMBER:	50148001
LESSON TITLE:	RADIO AND INTERPHONE PROCEDURES
DURATION:	2+00 HOURS
DATE REVISED:	2022-02
VERSION:	V.2022-02
REFERENCE(S):	FAA ORDER JO 7110.65, AIR TRAFFIC CONTROL
HANDOUT(S):	NONE
EXERCISE(S)/ ACTIVITY(S):	EXERCISE 1: BARRIERS TO COMMUNICATIONS EXERCISE 2: LISTENING FOR READBACK ERRORS
END-OF-LESSON TEST:	YES *(REFER TO ELT04.PDF)*
PERFORMANCE TEST:	NONE
MATERIALS:	NONE
OTHER PERTINENT INFORMATION:	*AUDIO FILES: "ATC COMMUNICATIONS," TOPIC 2 (7:34 MINUTES), AND "CLEARANCES AND READBACKS" (6:47 MINUTES)*

☞ ***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.*

INTRODUCTION

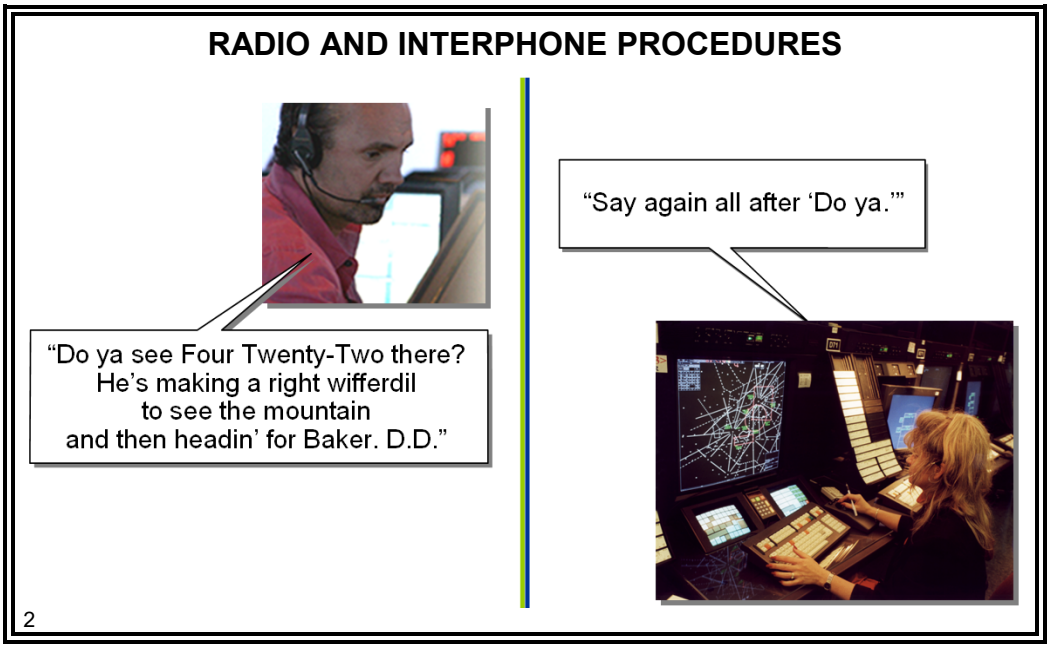
Gain Attention



Communication and coordination with aircraft and other controllers are some of the most important functions of daily air traffic control activities. A thorough understanding of appropriate procedures is critical to your success as an air traffic controller.

INTRODUCTION *(Continued)*

Opening Scenario



Correct monitoring and use of the radio and interphone equipment is an essential part of your job. How well you communicate is directly related to your ability to apply the procedures, rules, priorities, and format that govern radio and interphone communications.

Purpose

Review the use and monitoring of the radio and interphone circuits, the messages transmission and relay, message priorities, and communications. Also covered are controller communications skills, including speaking, listening, and remembering.

INTRODUCTION *(Continued)*

Lesson Objectives

LESSON OBJECTIVES

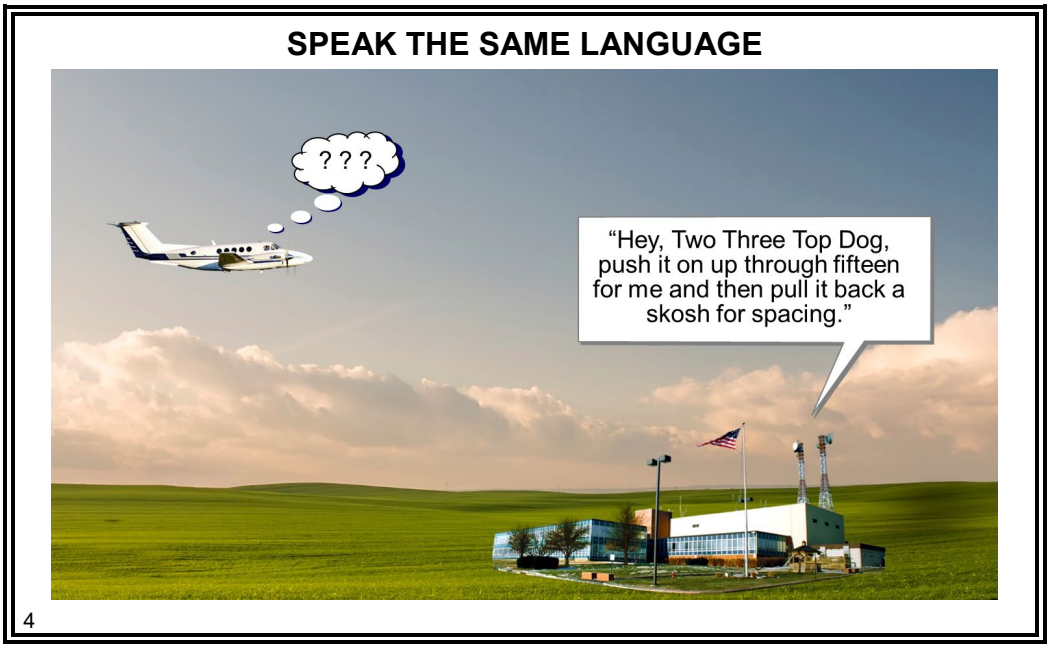
- On an End-of-Lesson Test and in accordance with FAA Order JO 7110.65, you will identify:
  - Requirements for monitoring radio frequencies and interphone circuits
  - Authorized transmissions, relays, and interruptions
  - The four interphone transmission priorities
  - Radio message format

3

☞ ***NOTE:*** *Teach from graphic.*

RADIO COMMUNICATIONS

Words and Phrases
JO 7110.65, par. 2-4-14



- Use the words or phrases in radio and interphone communications contained in the FAA Order JO 7110.65 Pilot/Controller Glossary
- En route controllers may omit the words "super" or "heavy" in communications, except:
  - When in communication with a terminal facility about super or heavy jet operations
  - In communication with or about super or heavy jet aircraft:
    - At an airport where an en route facility provides approach control service
    - When separation may become less than 5 miles by an approved procedure
  - When issuing traffic advisories
- When in communication with Air Force One or Air Force Two:
  - Do **not** use "heavy" with call sign
  - Regardless of the type aircraft, state "Air Force One/Two" **only**

RADIO COMMUNICATIONS *(Continued)*

Emphasis for Clarity
JO 7110.65, par. 2-4-15

⊙ Emphasize digits, letters, or similar sounding words to aid in distinguishing similar sounding call signs.

- Notify each pilot concerned when in communication with aircraft having similar sounding call signs

  Examples: "American Forty-four Twenty-one, be advised American Four Twenty-one is on frequency."

  "United Thirty-one, United, Cactus Thirty-one is also on this frequency, acknowledge."

- Notify Front Line Manager of any duplicate numbers/similar sounding call signs on aircraft operating simultaneously in the same sector

Radio Frequencies
JO 7110.65, par. 2-4-1

COMMUNICATIONS ARE RECORDED

5

⊙ Use radio frequencies for the specific purpose for which they are intended.

- Radio and interphone communications are recorded and are official government records. They may be reviewed in conjunction with operational errors and deviations, court proceedings, Freedom of Information Act request, etc.

NOTE: Students should be aware that at some facilities, handsets used on midnight shifts may be recorded even when the transmit button is **not** depressed.

RADIO COMMUNICATIONS *(Continued)*

Monitoring
JO 7110.65,
par. 2-4-2

⊙ Monitor interphones and assigned radio frequencies continuously.

⊙ Maintain adequate volume to hear all calls.

Pilot Acknowledge-ment
JO 7110.65,
par. 2-4-3

⊙ Ensure acknowledgment from pilot for all clearances or instructions issued.

NOTE: Pilot may acknowledge by using “WILCO,” “ROGER,” “AFFIRMATIVE,” or other words or remarks. However, without ensuring acknowledgment from the pilot, two clearances may be “in effect” – the last one the pilot is aware of and the one you thought you just gave.

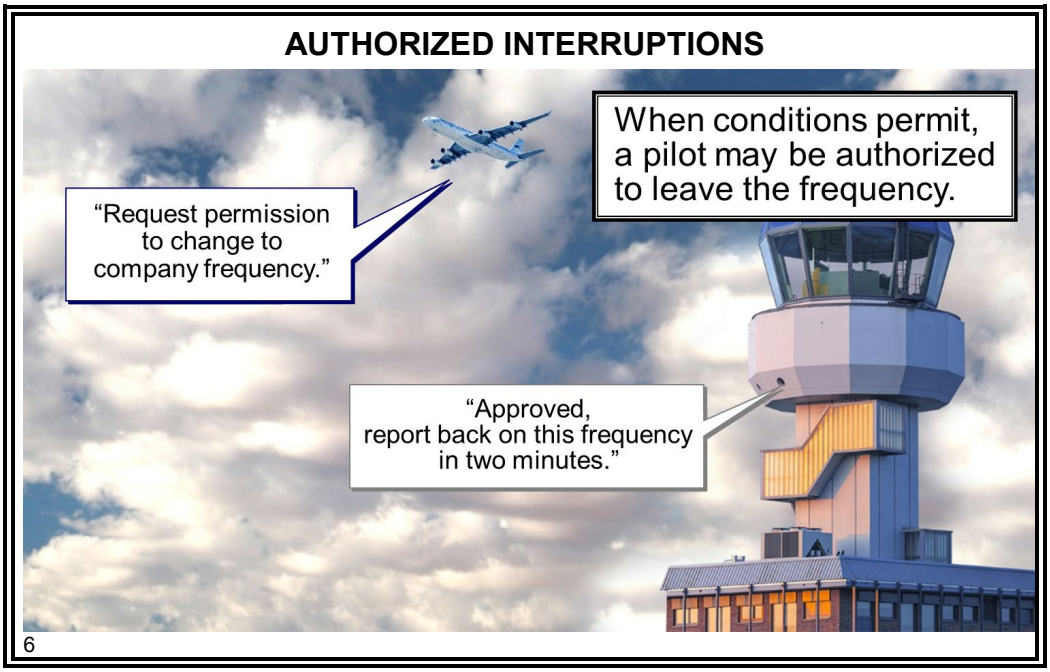
⊙ If altitude, heading, or other items are read back by the pilot, ensure the readback is complete and correct.

NOTE: Incorrect readbacks by the pilot that are **not** heard and corrected by the controller (hearback errors) have the same effect as if the controller issued an incorrect clearance. Readback errors by a pilot that are **not** corrected by a controller are controller errors.

- If incorrect or incomplete, make appropriate corrections

RADIO COMMUNICATIONS *(Continued)*

Authorized Interruptions
JO 7110.65, par. 2-4-4



☞ ***NOTE:*** *Click twice to build graphic.*

⊙ Pilots are required to monitor communications continuously unless otherwise authorized.

- Pilot **must** receive clearance to leave assigned frequency
- Pilot will request to abandon guard on assigned ATC frequency for a mutually agreeable time period

RADIO COMMUNICATIONS *(Continued)*

Authorized Transmissions
JO 7110.65, par. 2-4-5

AIR TRAFFIC CONTROL MESSAGES

7

⊙ Transmit **only** those messages:

- Necessary for air traffic control
- That contribute to air safety

False or Deceptive Communications
JO 7110.65, par. 2-4-6

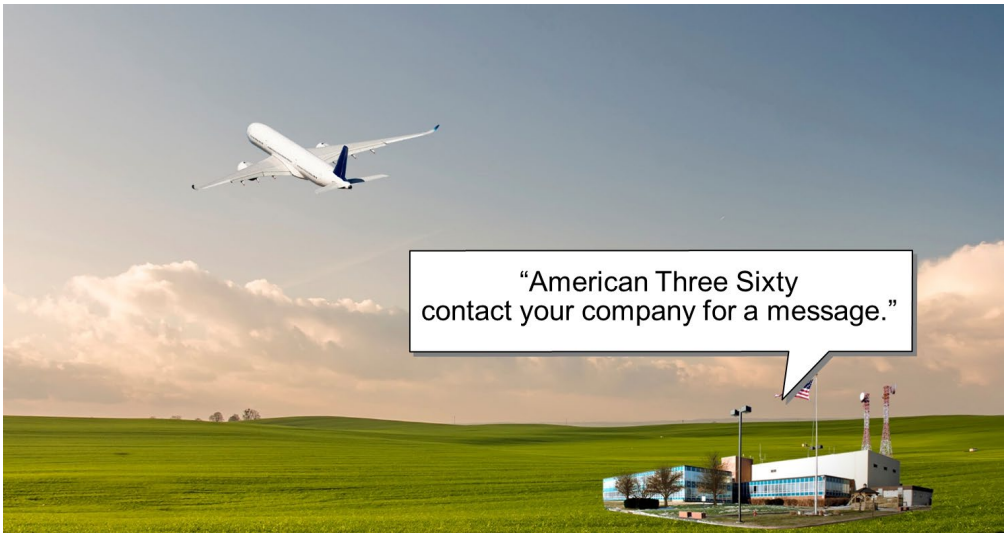
⊙ Take action to prevent and report false, deceptive, or phantom controller communications to an aircraft or controller.

- Correct false information
- Broadcast an alert on all frequencies where deceptive/phantom transmissions have been received
- Collect pertinent information regarding the incident
- Notify supervisor and report all relevant information pertaining to the incident

RADIO COMMUNICATIONS *(Continued)*

Authorized Relays
JO 7110.65, par. 2-4-7

AUTHORIZED RELAYS



8

- Relay operational information to:
  - Aircraft or aircraft operators as necessary
    - Do **not** handle on a regular basis
    - Give the source for any message relayed
  - Military aircraft operating on, or planning to operate on, IFR Military Training Routes (IR Routes)
- Relay official FAA messages as required.

NOTE: Occasionally clearances, flight plan cancellations, search and rescue information, emergency information, etc., may be relayed through other aircraft.

RADIO COMMUNICATIONS *(Continued)*

Radio Message Format

JO 7110.65, par. 2-4-8

RADIO MESSAGE FORMAT

9

☞ ***NOTE:*** *Click once to build graphic.*

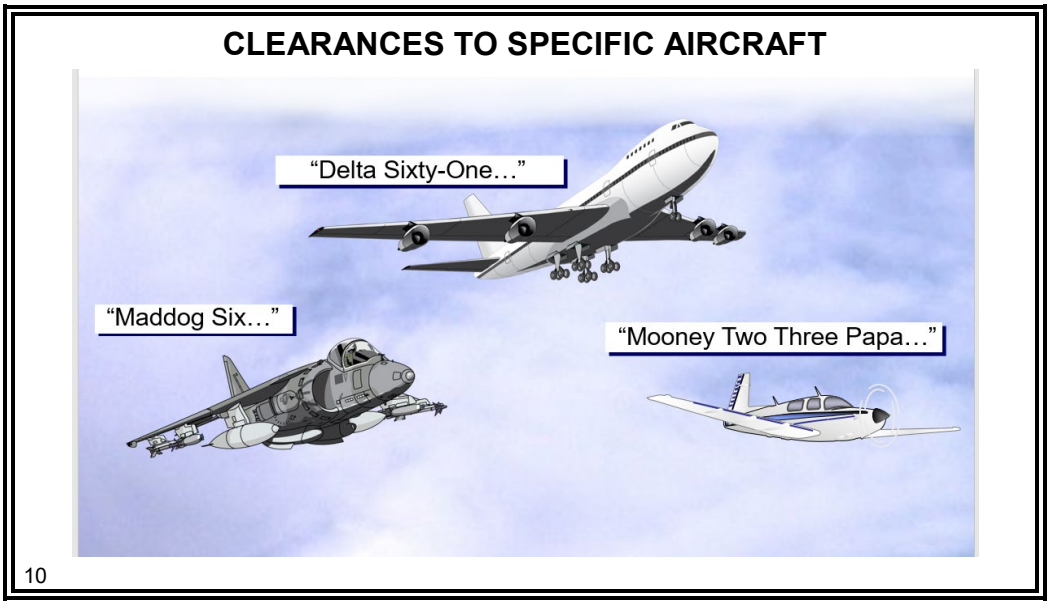
⊙ Initiate communications with an aircraft using the following format:

- On initial radio contact:
  - Identification of aircraft
  - Identification of ATC unit
  - Message (if any)
  - The word "OVER," if required

⊙ For subsequent radio communications from the same sector/position, use the same format, except:

- Identification of ATC unit may be omitted

Clearances to Specific Aircraft
JO 7110.65, par. 2-4-8



⊙ Preface the clearance or instructions with the identification of that aircraft.

RADIO COMMUNICATIONS *(Continued)*

Abbreviated Transmis-sions
JO 7110.65, par. 2-4-9

DO NOT ABBREVIATE SIMILAR CALL SIGNS

11

- For general aviation aircraft, use the identification prefix and the last three digits or letters after communications have been established.
- Exceptions
  - Do **not** abbreviate:
    - Similar sounding call signs
    - Military aircraft
    - Air carriers
    - Civil aircraft with an FAA authorized call sign
- Omit the facility identification after communication is established.
- Transmit the message immediately after call-up when:
  - Message is short

NOTE: If message is long or requires writing, warn the pilot before giving the message. Example: "(aircraft identification) I have a message/clearance for you. Advise when ready to copy."

  - Receipt is generally assured
- Omit the word "OVER" if the message obviously required a reply.

RADIO COMMUNICATIONS *(Continued)*

Knowledge Check

KNOWLEDGE CHECK

QUESTION: A clearance is not complete until what is received?

12

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

ANSWER: *An acknowledgement or correct readback*

KNOWLEDGE CHECK

QUESTION: What messages are Air Traffic Controllers authorized to transmit?

13

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

ANSWER: *Air traffic control and those contributing to air safety*

Continued on next page

Knowledge Check (Cont'd)

KNOWLEDGE CHECK

TRUE OR FALSE: After advising ATC of the reason, a pilot may discontinue frequency monitoring.

A. True

B. False

14

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

ANSWER: *False*

☞ ***NOTE:*** *Remind students that frequency monitoring may be discontinued* ***only*** *with ATC permission.*

KNOWLEDGE CHECK

QUESTION: What action should you take if false, deceptive, or phantom controller communications occur?

15

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

ANSWER: *Correct false information, broadcast alert, collect pertinent information, notify Front Line Manager*

Continued on next page

RADIO COMMUNICATIONS *(Continued)*

Knowledge Check (Cont'd)

KNOWLEDGE CHECK

QUESTION: What radio messages are Air Traffic Controllers authorized to relay?

16

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

ANSWER: *Operational information to aircraft or aircraft operators, official FAA messages, and operational information to military aircraft operating on or planning to operate on IR Routes*

KNOWLEDGE CHECK

QUESTION: When does an en route controller need to use the word "heavy"?

17

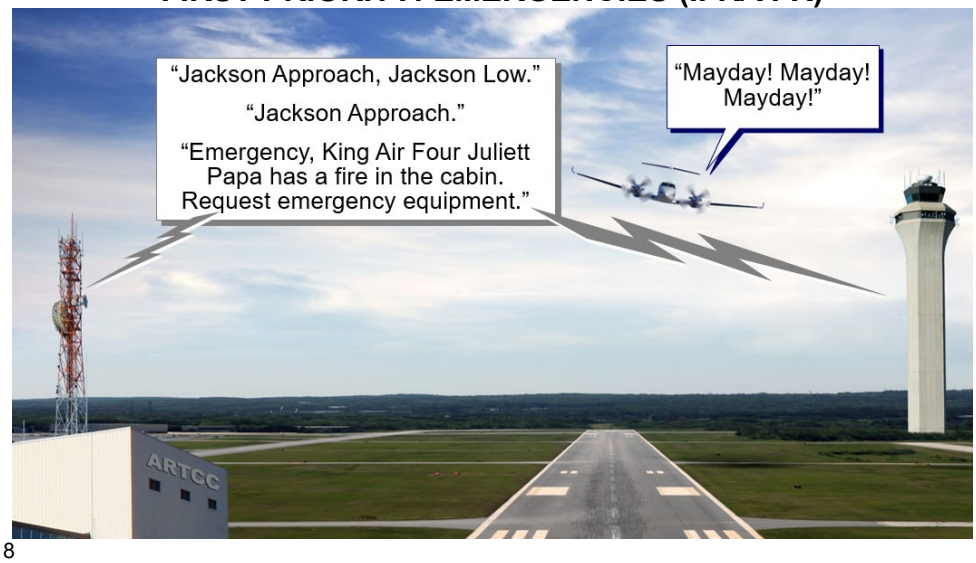
☞ ***NOTE:*** *Click once to show answer.*

ANSWER: *When in communication with a terminal facility about heavy jet operations; when in communication with or about heavy jet aircraft where the en route center is providing approach control service; and when issuing traffic advisories*

INTERPHONE COMMUNICATIONS

Interphone Transmission Priorities
JO 7110.65, par. 2-4-10

FIRST PRIORITY: EMERGENCIES (IFR/VFR)



18

☞ ***NOTE:*** *Click once to build graphic.*

⊙ First priority - emergency messages, including:

- Essential information on aircraft accidents or suspected accidents
  - You may **not** violate separation rules to expedite an emergency

Continued on next page

INTERPHONE COMMUNICATIONS *(Continued)*

Interphone Transmission Priorities (Cont'd)
JO 7110.65, par. 2-4-10

SECOND PRIORITY: CLEARANCE AND CONTROL INSTRUCTIONS

- Second priority - clearances and control instructions

Continued on next page

INTERPHONE COMMUNICATIONS *(Continued)*

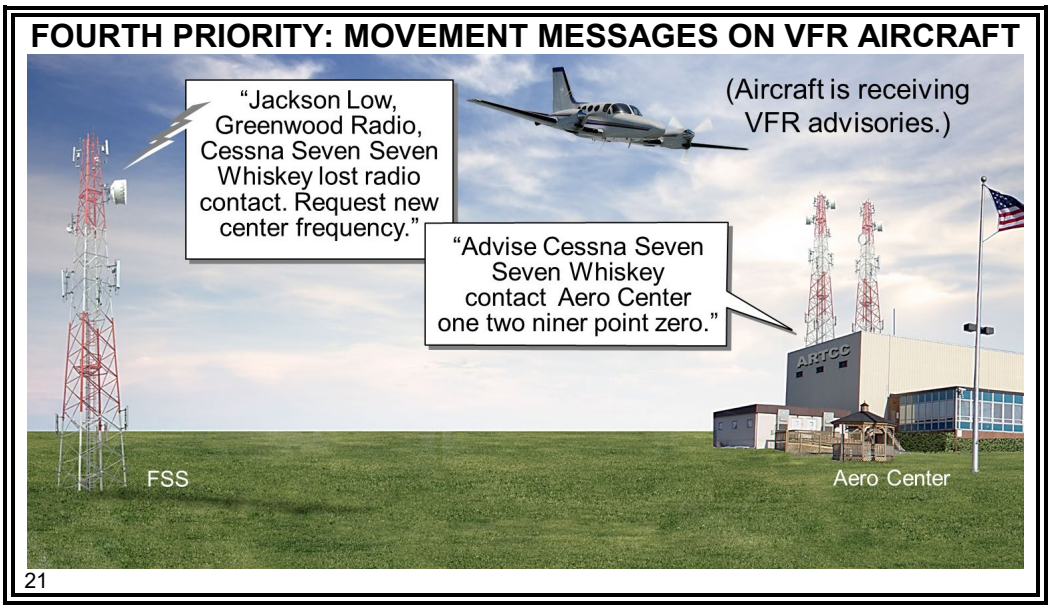
Interphone Transmission Priorities (Cont'd)
JO 7110.65, par. 2-4-10

- Third priority - movement and control messages in the following order of preference:
  - Progress reports
  - Departure or arrival reports
  - Flight plans

Continued on next page

INTERPHONE COMMUNICATIONS *(Continued)*

Interphone Transmission Priorities (Cont'd)
JO 7110.65, par. 2-4-10



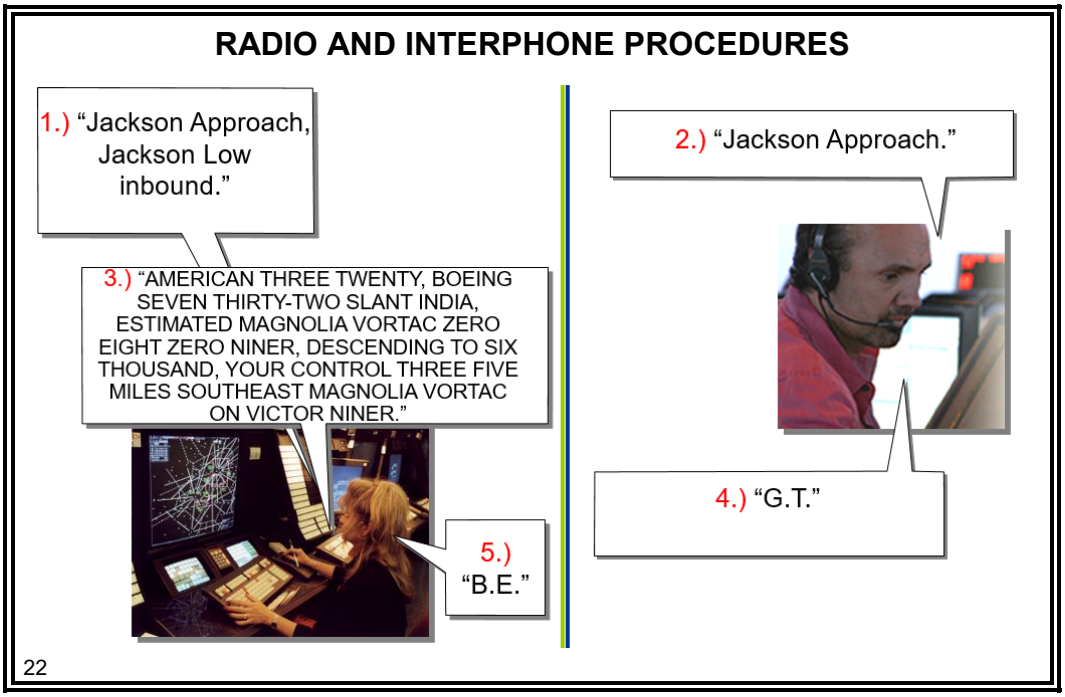
- Fourth priority - movement messages on VFR aircraft

Priority Interruption
JO 7110.65, par. 2-4-11

- To interrupt a lower priority message when you have an emergency or control message to transmit, use the words:
  - "Emergency," or
  - "Control"

  Example: "Break for control"

Interphone Message Format
JO 7110.65, par. 2-4-12



☞ ***NOTE:*** *Click five times to display dialogue*

⊙ Use the following format for inter/intrafacility communications:

- Caller states identification of:
  - Position being called
  - Position calling and line being used, if necessary

☞ ***NOTE:*** *If the facilities utilize numeric position identification, the caller* ***must*** *identify both the facility and position.*

- Receiver states position identification
- Caller states type of coordination to be accomplished, when advantageous

NOTE: "Handoff" or "APREQ." Sometimes it may be more advantageous to include this after identification of position calling. **Example:** "Rocket, Smyrna, Ninety-line, point out."

- Caller states message
- Receiver states response to the caller's message followed by receiver's operating initials

Continued on next page

INTERPHONE COMMUNICATIONS *(Continued)*

Interphone Message Format (Cont'd)
JO 7110.65, par. 2-4-12

NOTE: Receiver's response includes readback of caller's request/ information when appropriate.

- Caller states operating initials

Interphone Message Termination
JO 7110.65, par. 2-4-13

⊙ Terminate all interphone messages with your operating initials.

Facility Identification
JO 7110.65, par. 2-4-19

⊙ Identify facilities as follows:

- Airport traffic control towers: state the name of the facility followed by the word "tower," e.g., Greenwood Tower
- Approach control facilities: state the name of the facility followed by the word "approach," e.g., Jackson Approach
- Flight Service Stations: state the name of the facility followed by the word "radio," e.g., Greenwood Radio

COMMUNICATION SKILLS

Information to be Communicated

⊙ Controllers are required to speak, hear, and remember massive amounts of critical operational data.

☞ ***NOTE:*** *Ask students to give examples of data that controllers typically communicate. Add items as needed so that the list includes: call signs, altitudes, positions of aircraft, headings, speeds, routes and destinations, pilot requests, and weather.*

Characteristics of Controller Information

⊙ Dynamic

- Data is constantly changing

⊙ Requires prioritization

- There are so many items communicated that the controller **must** be able to identify those which are most critical to safety

⊙ Data is transmitted amid distractions

- Both the speaker and listener **must** focus and communicate so that the message is clearly understood and remembered

Controller Responsibilities in Communication

⊙ Speaking

- Use standard phraseology
- Use concise format
- Enunciate clearly
- Use even tone, pitch, and rate
- Be specific and explicit

⊙ Listening

- Focus and pay attention
- Use active listening

📖 **Active listening**, generally speaking, is a form of listening and responding that focuses on the speaker.

- The listener **must** attend to the speaker fully, and then repeat, in the listener's own words, what he or she thinks the speaker has said

Continued on next page

COMMUNICATION SKILLS *(Continued)*

Controller Responsibilities in Communication (Cont'd)

- The listener does **not** have to agree with the speaker - he or she **must** simply state what they think the speaker said

⊙ In pilot/controller communication, the pilot (speaker) is stating what he/she plans to do in the clearance readback. Therefore, it is essential that the controller (listener):

- Devote his/her full attention to the pilot readback of a clearance or instruction
- Verify that all essential elements of the clearance are read back correctly
- Separate the unexpected or unusual information from the expected information

⊙ Pilot/controller interaction requires:

- Good speaking and listening skills
- Professional attitude
- Assertive communication
- Communication that is appropriate for the type of pilot

EXERCISE 1: BARRIERS TO COMMUNICATION

Exercise 1

BARRIERS TO COMMUNICATION EXERCISE

Audio 1 Audio 4 Audio 7

Audio 2 Audio 5

Audio 3 Audio 6

Purpose: to practice identifying strengths and weaknesses in controller/ pilot communications

Directions: listen to verbal exchanges and list the strengths and weaknesses of each controller's style of communication

23

Directions

You will hear seven different audios of verbal exchanges between controllers and pilots. As you listen to the segment, write down the strengths and weaknesses of each controller's style of communication, and what impact that style might have on the controllers' communication. Be prepared to discuss your answers after each audio file.

☞ ***NOTE:*** *Click on the audio icon left of the "Audio 1" button. Students will record their answers in the table provided. Discuss their answers. Then click on the second audio icon and continue in the same format. Replay the segments, as necessary.*

After discussing the seventh audio segment have the students answer the three questions listed after the table. Then discuss the student's answers .

EXERCISE 1: BARRIERS TO COMMUNICATION

(Continued)

Answers

#	Communications Strengths/Weaknesses	Impact on Communication
1	*Controller is uptight and irritable - **not** professional.*	*Pilots may respond in the same manner - won't be willing to help out controller.*
2	*Controller uses slang and nonstandard phraseology.*	*Pilots may **not** understand what controller means.*
3	*Controller speaks very quietly.*	*Hard for pilots to hear*
4	*Controller is tentative, unsure - **not** convincing.*	*Pilots may walk all over controller - **not** confident in controller's ability.*
5	*Controller speaks very rapidly.*	*Pilots might miss something important - feel rushed.*
6	*Controller repeats information (not necessary).*	*Pilots will be annoyed.*
7	*Controller speaks rapidly and presents too much information in a single transmission.*	*Pilots will miss something important.*

EXERCISE 1: BARRIERS TO COMMUNICATION

(Continued)

Discussion Questions

☞ ***NOTE:*** *Use the following questions to generate a discussion about barriers to communication.*

QUESTION: What barriers to communication were created by the controllers' manner of speaking or attitude?

QUESTION: What impact might these types of barriers have on the effectiveness of communication?

QUESTION: What might be causing the controllers to communicate this way?

EXERCISE 2: LISTENING FOR READBACK ERRORS

Exercise 2

LISTENING FOR READBACK ERRORS EXERCISE

Purpose: to practice detecting readback errors

Directions: listen for readback errors and write them in the spaces provided; be prepared to discuss each situation

24

Directions

You will hear an audio file that contains recordings of eight typical situations with numerous clearances being issued. Listen for readback errors and write them in the spaces provided. Be prepared to discuss each situation.

☞ ***NOTE:*** *Start the audio file and let it play through all eight examples. A transcript of the examples is included on the following pages. Students should record their answers in the table provided.*

EXERCISE 2: LISTENING FOR READBACK ERRORS
(Continued)

Answers

Aircraft ID	Errors
1. LN92DF	*Pilot read back wrong altitude and exact direction. Controller phraseology: call sign "Fox."*
2. LOBO544	*Pilot read back the wrong altitude.*
3. AAL1	*None*
4. DAL663	*Pilot read back the wrong altitude.*
5. USA1856	*Pilot read back the wrong point to cross. Controller used grouped form of ten.*
6. USA1781	*Pilot read back the wrong altitude.*
7. N13D	*None*
8. AAL846	*Pilot read back the wrong altitude.*

EXERCISE 2: LISTENING FOR READBACK ERRORS
(Continued)

Transcript

1. *Controller: "LN92DF, cross seven five south of Richmond at FL290"*
   Pilot: "Seventy-five miles southwest of Richmond at FL250"
   Error: *Pilot read back wrong altitude and exact direction. Controller phraseology: call sign "Fox."*

2. *Controller: "LOBO544, cross three zero miles southwest of Dupont at and maintain FL260"*
   Pilot: "Three zero southwest of Dupont at 230, LOBO544"
   Error: *Pilot read back the wrong altitude.*

3. *Controller: "AAL1, descend and maintain one two thousand"*
   Pilot: "AAL1, Roger, descending to one two thousand"
   Error: *None*

4. *Controller: "DAL663, cross one five northeast of Waterloo at FL180"*
   Pilot: "One five fifteen northeast of Waterloo at one five zero, DAL663"
   Error: *Pilot read back the wrong altitude. Controller did not say "miles."*

5. *Controller: "USA 1856, descend to cross ten east of Tar River FL210."*
   Pilot: "Descend to cross Tar River at 210, USA1856"
   Error: *Pilot read back the wrong point to cross. Controller used grouped form of ten.*

6. *Controller: "USA1781, cross three zero miles southwest of Dupont at FL260"*
   Pilot: "Thirty southwest of Dupont at 270, USA1781"
   Error: *Pilot read back the wrong altitude.*

7. *Controller: "Lear One Three Delta, fly heading zero two zero, vectors for traffic"*
   Pilot: "Lear One Three Delta, heading zero two zero for traffic"
   Error: *None*

8. *Controller: "AAL846, cross niner zero miles southwest of Armel at and maintain FL270"*
   Pilot: "OK nine zero southwest of Armel at and maintain two zero for Amer… 240 for AAL846"
   Error: *Pilot read back the wrong altitude.*

☞ ***NOTE:*** *In the next segment on the audio file, the controller corrects the readback errors. Use this segment to allow students to check their work.*

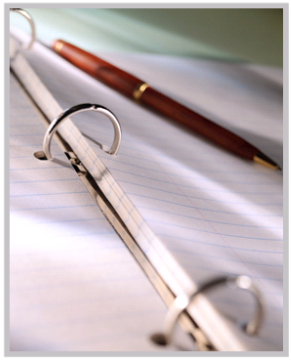
IN CONCLUSION

Lesson Review

LESSON REVIEW

The following information was covered in this lesson:

- Radio communications
- Interphone communications
- Communication skills



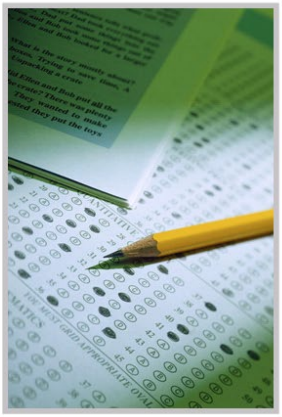
25

☞ ***NOTE:*** *Teach from graphic. Review and elaborate briefly on the topics covered in this lesson.*

End-of-Lesson Test

END-OF-LESSON TEST

Radio and Interphone Procedures



26