Federal Aviation Administration

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

Lesson 2: Radio and Interphone Communication

Version: 1.0 2022.08

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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	Radio and Interphone Communication
Duration	2 hours, 30 minutes (Includes lesson, ELT and exercises)
Version	1.0 2022.08
Reference(s)	JO 7110.65, Air Traffic Control; JO 7610.4, Special Operations; JO 7340.2, Contractions
Prerequisites	NONE
Handout(s)	⊙ Exercise 1: ATC Times ⊙ Exercise 2: Numbers Phraseology, Part 1 ⊙ Exercise 3: Numbers Phraseology, Part 2 ⊙ Exercise 4: Communications Skills ⊙ Exercise 5: Listening for readback errors
Exercise / Activity	Review Activity: Interphone Communication
Scenario	NONE
Assessments	⊙ YES - Written
Materials and Equipment	⊙ Pencil and/or pen ⊙ Appendix: Words and Phrases
Other Pertinent Information	⊙ **Ensure lesson materials are downloaded to the classroom computer** ⊙ Appendix: Words and Phrases ⊙ Audio files: "Barriers to communication" (7:29 minutes) and "Listening for readback errors" (6:33 minutes) will be used in exercises 4 and 5. These files are embedded in the PowerPoint file ⊙ Course 57827, Radio and Interphone Communication (or current) course is available as supplemental training for this lesson ⊙ This lesson is based on ERAM EAE 410 ⊙ The lesson has been reviewed and reflects the current orders and manuals as of April 2022

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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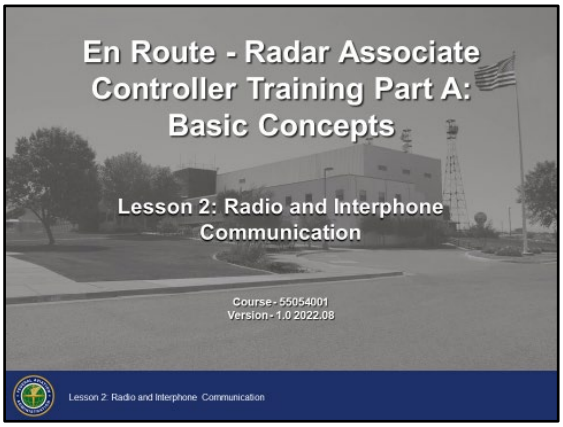
LESSON INTRODUCTION

Lesson Overview



Overview

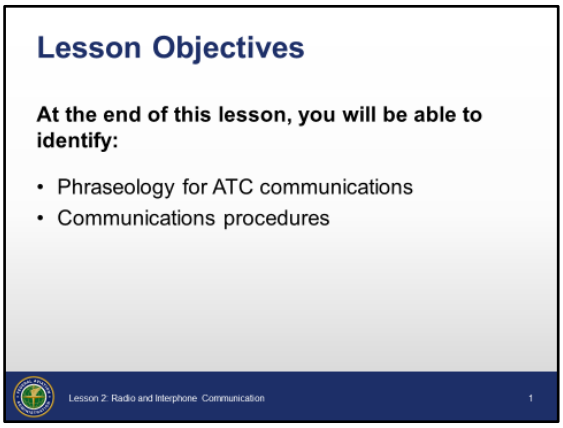
Correct monitoring and use of the radio and interphone equipment is an essential part of your job. How well you communicate is directly related to your ability to apply the procedures, rules, priorities, and formats that govern radio and interphone communication.

This lesson covers the use and monitoring of the radio and interphone circuits, the messages you may transmit and relay, message priorities, and communications. Also covered are controller communications skills, including speaking and listening.

Pilot acknowledgement of ATC instructions is very important. Controller requirements for dealing with missing pilot acknowledgements of clearances will be addressed in this lesson.

LESSON INTRODUCTION *(CONT'D)*

Lesson Objectives



Objectives

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

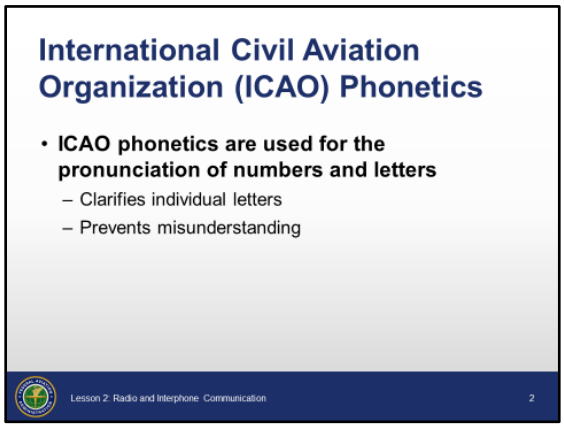
- Phraseology for ATC communications
- Communications procedures

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.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) PHONETICS

ICAO Phonetics

JO 7110.65, par. 2-4-16, table 2-4-1



International Civil Aviation Organization (ICAO) Phonetics

- Used for the pronunciation of numbers and letters
  - Clarifies individual letters
  - Prevents misunderstanding
- JO 7110.65 table 2-4-1 lists the pronunciation of numbers and letters

Character	Word	Pronunciation
0	Zero	ZE-RO
1	One	WUN
2	Two	TOO
3	Three	TREE
4	Four	FOW-ER
5	Five	FIFE
6	Six	SIX
7	Seven	SEV-EN
8	Eight	AIT
9	Nine	NIN-ER

Continued on next page

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO) PHONETICS *(CONT'D)*

ICAO Phonetics (Cont'd)

JO 7110.65, par. 2-4-16, table 2-4-1

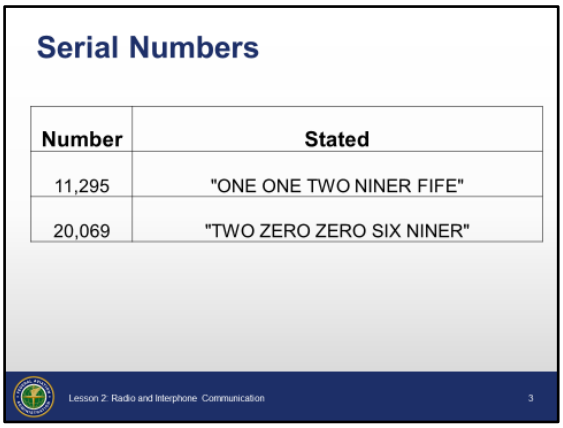
A	Alfa	ALFAH
B	Bravo	**BRAH**VOH
C	Charlie	**CHAR**LEE
D	Delta	**DELL**TAH
E	Echo	**ECK**OH
F	Foxtrot	**FOKS**TROT
G	Golf	GOLF
H	Hotel	HOH**TELL**
I	India	**IN**DEE AH
J	Juliett	**JEW**LEE ETT
K	Kilo	**KEY**LOH
L	Lima	**LEE**MAH
M	Mike	MIKE
N	November	NO**VEM**BER
O	Oscar	**OSS**CAH
P	Papa	PAH**PAH**
Q	Quebec	KEH**BECK**
R	Romeo	**ROW**ME OH
S	Sierra	SEE**AIR**AH
T	Tango	**TAN**GGO
U	Uniform	**YOU**NEE FORM
V	Victor	**VIK**TAH
W	Whiskey	**WISS**KEY
X	X-ray	**ECKS**RAY
Y	Yankee	**YAN**GKEY
Z	Zulu	**ZOO**LOO

NOTE: Syllables to be emphasized in pronunciation are in bold.

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS

Serial Numbers

JO 7110.65, pars. 2-4-17, 2-4-18



Serial Numbers

- When communicating a number, state each digit separately and omit any commas

  Examples:

  “ONE ONE TWO NINER FIFE”

  “TWO ZERO ZERO SIX NINER”

- The number “0” is spoken as ZERO except where it is used in approved group form for authorized aircraft call signs, and in stating altitudes

  Examples:

  “FIELD ELEVATION ONE SIX ZERO”

  “HEADING TREE ZERO ZERO”

  “UNITED FIFE THIRTY”

  “ONE ZERO THOUSAND FIFE HUNDRED”

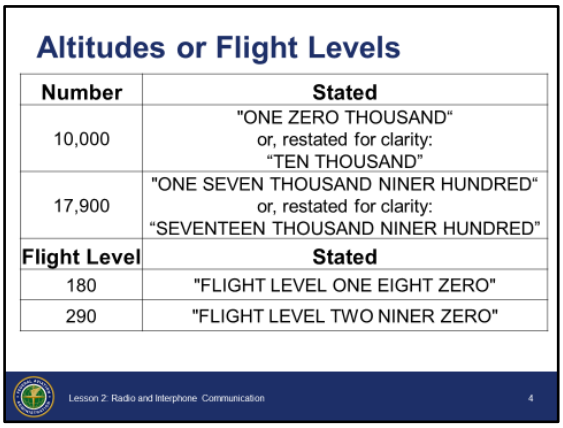
  “TEN THOUSAND FIFE HUNDRED”

NOTE: If necessary for clarification, and after stating numbers as specified in the following sections, controllers may restate numbers using either group or single digit form.

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Altitudes or Flight Levels

JO 7110.65, par. 2-4-17



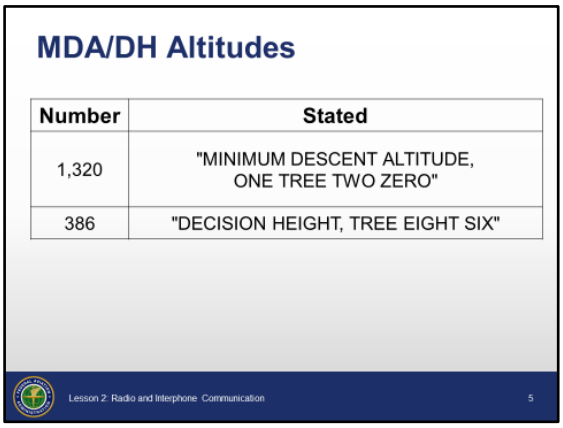
Altitudes or Flight Levels

- Altitudes
  - Pronounce each digit in the number of hundreds or thousands followed by the word HUNDRED or THOUSAND as appropriate
  - Altitudes may be restated in group form for clarity
- Flight Levels
  - When stating flight levels, say the words FLIGHT LEVEL followed by the separate digits

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Minimum Descent Altitude (MDA)/Decision Height (DH) Altitudes

JO 7110.65, par. 2-4-17, Pilot/Controller glossary (PCG)



MDA/DH Altitudes

- State the separate digits of the MDA/DH altitude

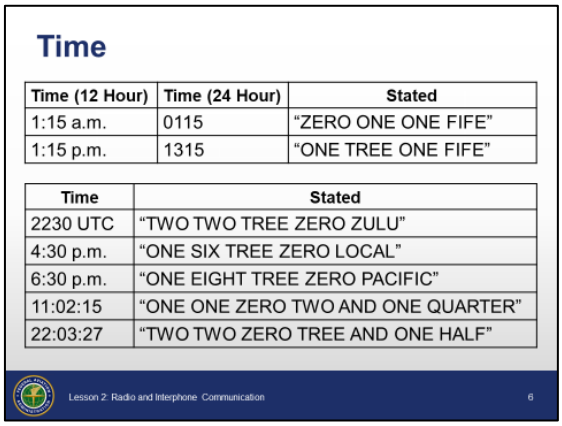
MINIMUM DESCENT ALTITUDE (MDA) - The lowest altitude expressed in feet above mean sea level (MSL) to which descent is authorized on a standard instrument approach procedure.

DECISION ALTITUDE/DECISION HEIGHT - A specified altitude or height (A/H) in the precision approach at which a missed approach must be initiated.

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Time

JO 7110.65, par. 2-4-17

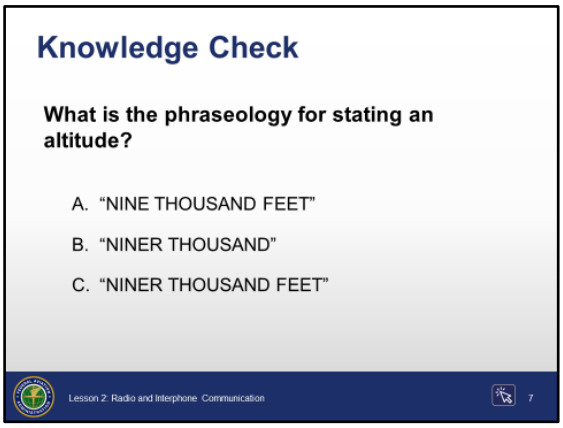


Time

- The 24 hour clock is used in air traffic control and is expressed in terms of Coordinated Universal Time (UTC)
  - UTC is used to ensure that aircraft and air traffic control facilities are all using the same time and are not on different time zones
  - The term ZULU may be used to denote UTC
- Upon request:
  - State the four separate digits of the hours and minute(s) in terms of UTC followed by the local standard time equivalent; or the local time equivalent only
  - Local time may be based on the 24 hour clock system
    - The word LOCAL or the time zone equivalent must be stated when other than UTC is referenced
- When stating time, or giving a time check:
  - State the word TIME followed by the four separate digits of the hour and minutes, and the nearest quarter minute
    - Single digit hours are preceded with a zero
    - Fractions of a quarter minute of eight seconds or more are stated as the following quarter minute
- Abbreviated time
  - State the separate digits of the minutes only

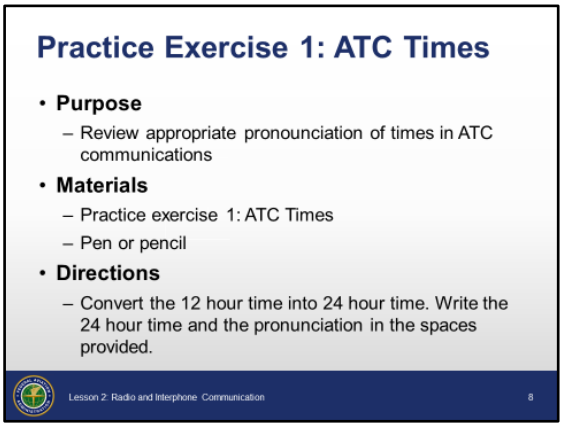
NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Knowledge Check



Question: What is the phraseology for stating an altitude?

PRACTICE EXERCISE 1: ATC TIMES



Purpose

Review appropriate pronunciation of times in ATC communications.

Materials

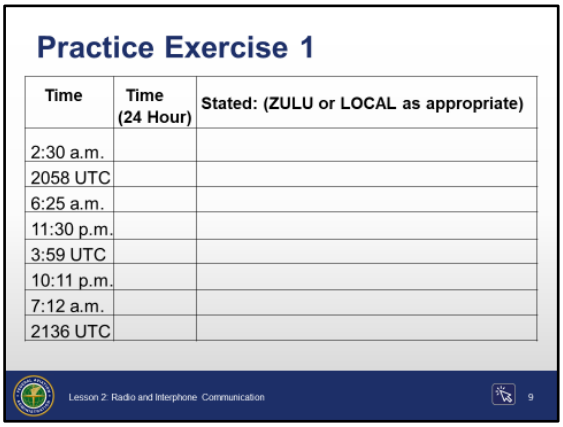
Handout

- Practice Exercise 1 from lesson 2 handout: ATC Times
- Pen or pencil

Directions

This exercise takes approximately 10 minutes to complete. Convert the 12 hour time into the 24 hour time. Write the 24 hour time and the pronunciation of the time in the spaces provided.

PRACTICE EXERCISE 1: ATC TIMES *(CONT'D)*



Practice Exercise 1

Time	Time (24 Hour)	Stated: (ZULU or LOCAL as appropriate)
2:30 a.m.		
2058 UTC		
6:25 a.m.		
11:30 p.m.		
3:59 UTC		
10:11 p.m.		
7:12 a.m.		
2136 UTC		

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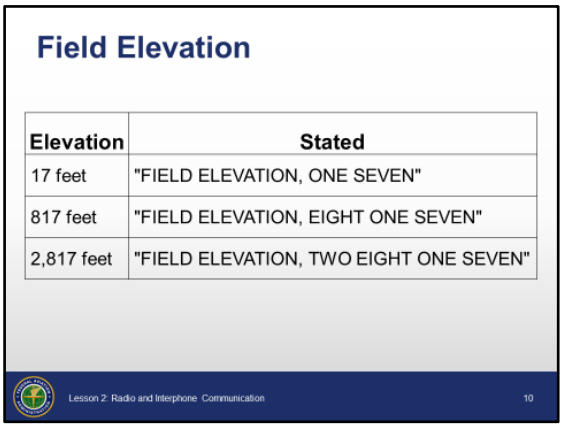
PRACTICE EXERCISE 1: ATC TIMES *(CONT'D)*

Worksheet		
Time	**Time (24 Hour)**	**Stated: (ZULU or LOCAL as appropriate)**
2:30 a.m.		
2058 UTC.		
6:25 a.m.		
11:30 p.m.		
03:59 UTC		
10:11 p.m.		
7:12 a.m.		
2136 UTC.		

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Field Elevation

JO 7110.65, par. 2-4-17, PCG



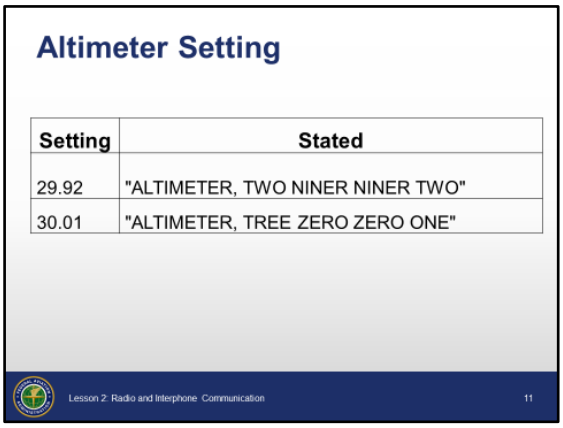
Field Elevation

- When giving Field Elevation, say the words FIELD ELEVATION followed by the separate digits of the elevation
  - Field Elevation is also known as Airport Elevation
- Airport Elevation is the highest point of an airport's usable runways measured in feet from MSL

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Altimeter Setting

JO 7110.65, par. 2-4-17

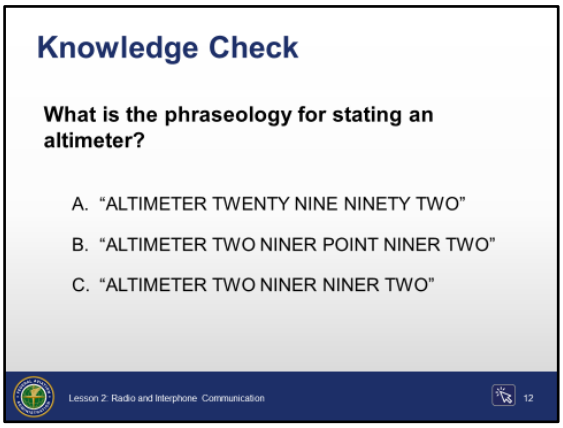


Altimeter Setting

- ⊙ State the word ALTIMETER followed by the separate digits of the altimeter setting
  - The POINT is omitted

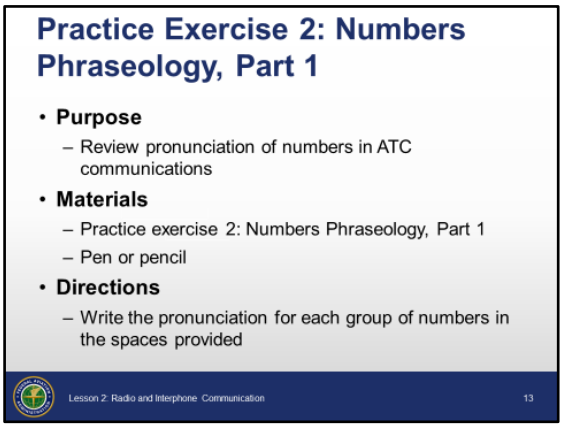
NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Knowledge Check



Question: What is the phraseology for stating an altimeter?

PRACTICE EXERCISE 2: NUMBERS PHRASEOLOGY, PART 1



Purpose

Review pronunciation of numbers in ATC communications.

Materials

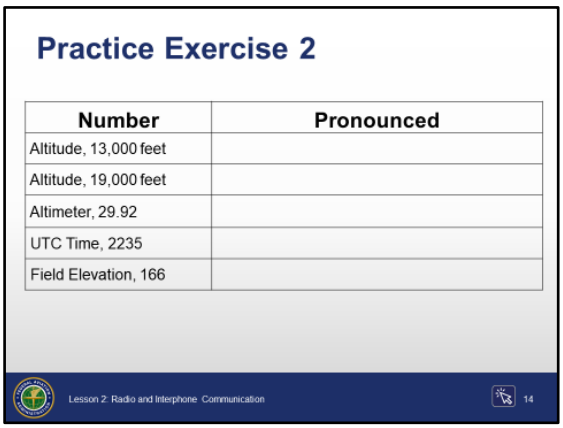
Handout

- Practice Exercise 2 from lesson 2 handout: Numbers Phraseology, Part 1
- Pen or pencil

Directions

This exercise takes approximately 15 minutes to complete. Write the pronunciation for each group of numbers in the spaces provided.

PRACTICE EXERCISE 2: NUMBERS PHRASEOLOGY, PART 1 *(CONT'D)*



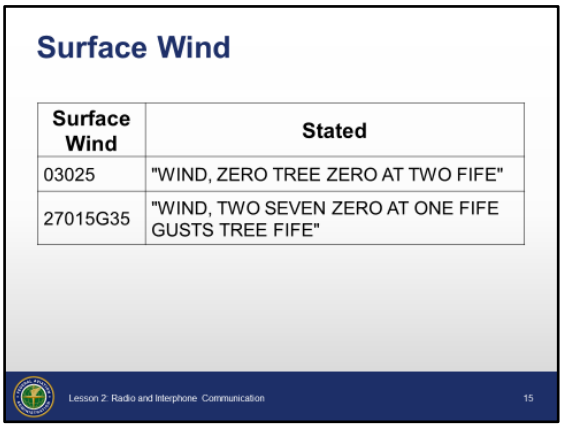
PRACTICE EXERCISE 2: NUMBERS PHRASEOLOGY, PART 1 *(CONT'D)*

Worksheet	
Number	**Pronounced**
Altitude, 13,000	
Flight Level, FL190	
Altimeter, 29.92	
UTC Time, 2235	
Field Elevation, 166	

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Surface Wind

JO 7110.65, par. 2-4-17



Surface Wind

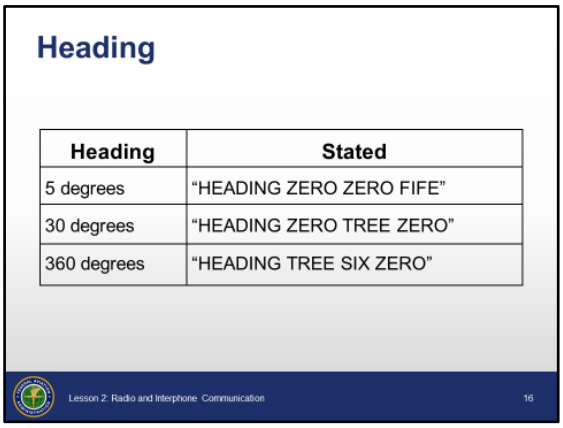
- ⊙ Wind direction is based on 360 degrees and is given to the nearest 10 degrees
  - State the word WIND followed by the separate digits of the indicated direction, then the word AT and the separate digits of the velocity in knots
  - When necessary include the word GUSTS and the gust velocity in knots

NOTE: The direction indicated is always the direction the wind is blowing from.

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Heading

JO 7110.65, par. 2-4-17



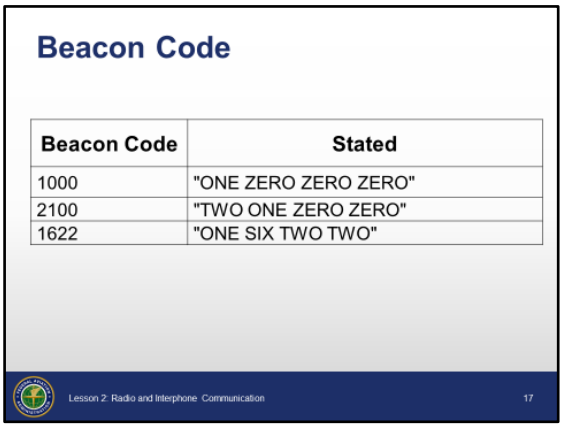
Heading

- Based on 360 degrees and is stated by saying the word HEADING, followed by the three separate digits of the number of degrees
  - When assigning, omit the word DEGREES
  - When the heading is two digits, precede with a ZERO
  - When the heading is a single digit, precede with ZERO ZERO

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Beacon Code

JO 7110.65, par. 2-4-17



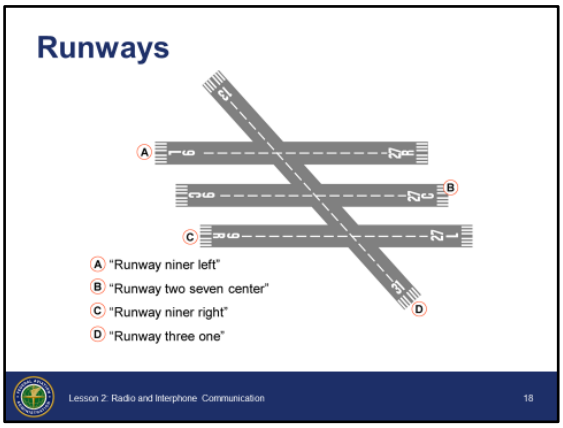
Beacon Code

- State the separate digits of the four digit code

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Runways

JO 7110.65, par. 2-4-17



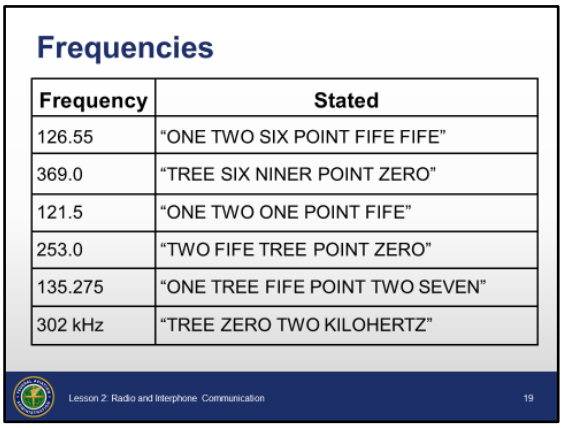
Runways

- State the word RUNWAY followed by the separate digits of the runway
- For parallel runway, state the word LEFT, RIGHT, or CENTER if the letter "L", "R", or "C" is included in the runway designation

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Frequencies

JO 7110.65, par. 2-4-17



Frequencies

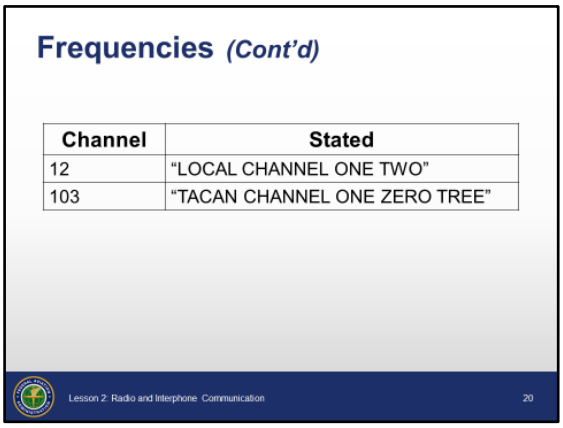
- State the separate digits of the frequency, inserting the word POINT where the decimal point occurs
  - Omit the third digit to the right of the decimal point

    Example: 118.675 stated as "ONE ONE EIGHT POINT SIX SEVEN"
- When the frequency is in the Low/Medium Frequency (L/MF) band, include the word KILOHERTZ

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Frequencies (Cont'd)

JO 7110.65, par. 2-4-17



- Military aircraft may use local channel numbers in lieu of frequencies for locally based aircraft when the local aircraft and ATC use the same channel

  NOTE: This information is contained in the appropriate documents, such as a Letter of Agreement.

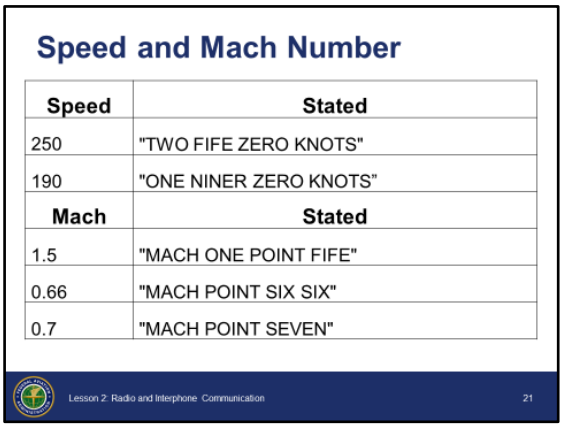
- Issue TACAN frequencies by stating the assigned two or three digit channel number

  NOTE: This information is found on the associated approach or controller charts.

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Speed and Mach Number

JO 7110.65, pars. 2-4-17, 5-7-2



Speed and Mach Number

- Speed
  - State the separate digits of the speed followed by the word KNOTS except as required by JO 7110.65 paragraph 5-7-2, Speed Adjustment Methods

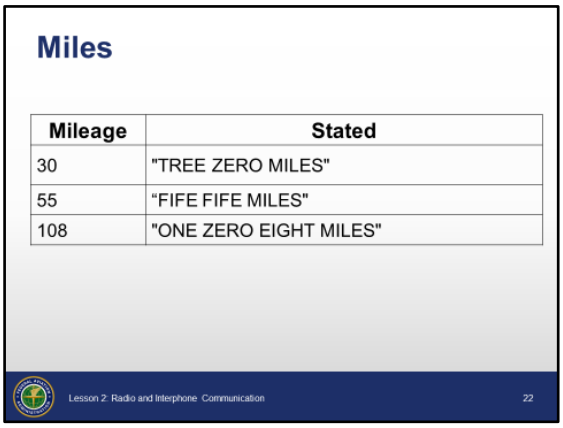
    Example: "REDUCE SPEED TO TWO FIFE ZERO"

    "MAINTAIN TWO EIGHT ZERO KNOTS"
- Mach
  - State the word MACH followed by the separate digits of the Mach number
  - Insert the word POINT where the decimal point appears

NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Miles

JO 7110.65, par. 2-4-17

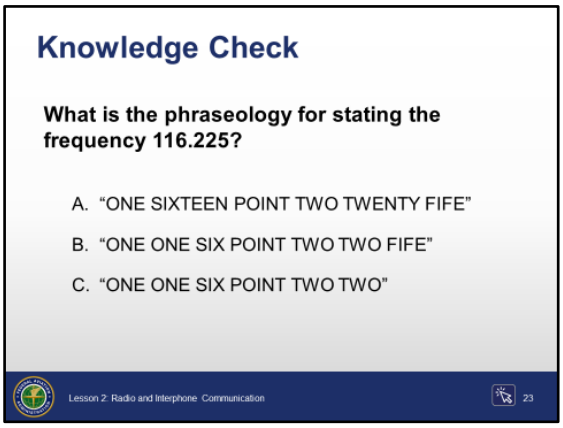


Miles

- State the separate digits of the mileage, followed by the word MILE or MILES

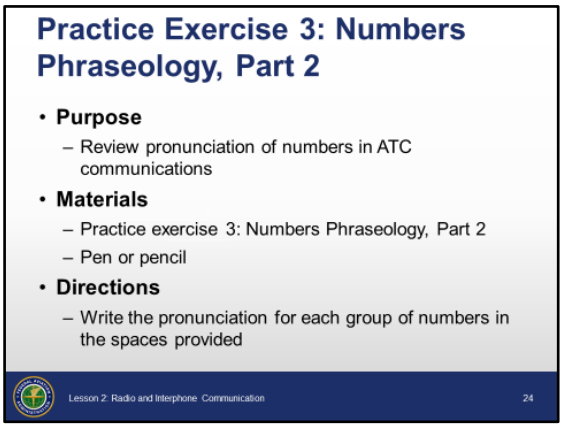
NUMBER PHRASEOLOGY FOR ATC COMMUNICATIONS *(CONT'D)*

Knowledge Check



Question: What is the phraseology for stating the frequency 116.225?

PRACTICE EXERCISE 3: NUMBERS PHRASEOLOGY, PART 2



Purpose

Review pronunciation of numbers in ATC communications.

Materials

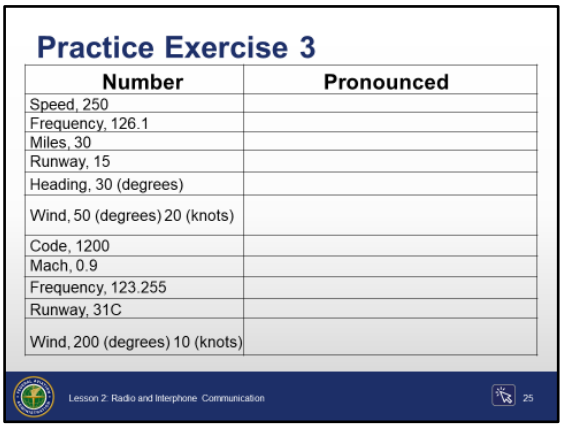
Handout

- Practice Exercise 3 from lesson 2 handout: Numbers Phraseology Part 2
- Pen or pencil

Directions

This exercise takes approximately 10 minutes to complete. Write the pronunciation for each group of numbers in the spaces provided.

PRACTICE EXERCISE 3: NUMBERS PHRASEOLOGY PART 2

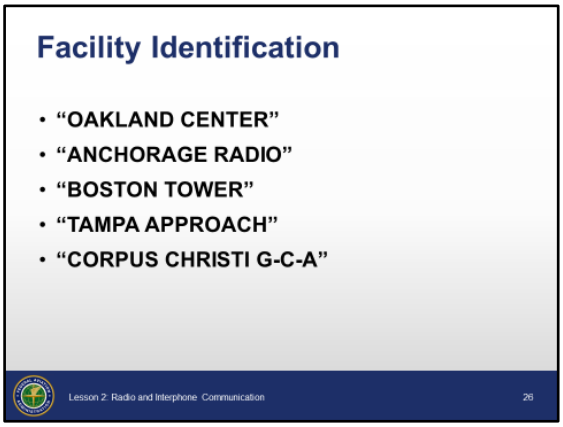


PRACTICE EXERCISE 3: NUMBERS PHRASEOLOGY, PART 2 *(CONT'D)*

Worksheet	
Number	**Pronounced**
Speed, 250	
Frequency, 126.1	
Miles, 30	
Runway, 15	
Heading, 30 (degrees)	
Wind, 50 (degrees), 20 (knots)	
Code, 1200	
Mach, 0.9	
Frequency, 123.255	
Runway, 31C	
Wind, 200 (degrees), 10 (knots)	

Facility Identification

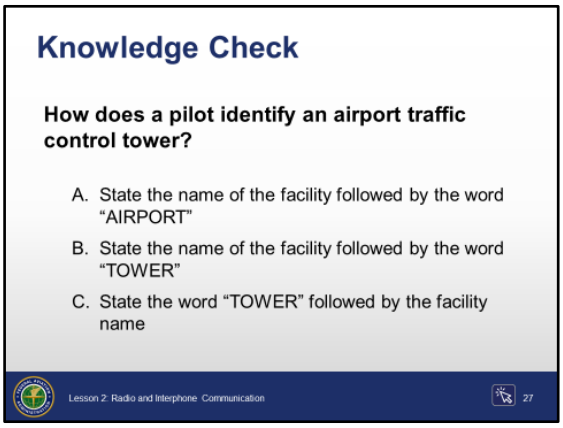
JO 7110.65, par. 2-4-19



Facility Identification

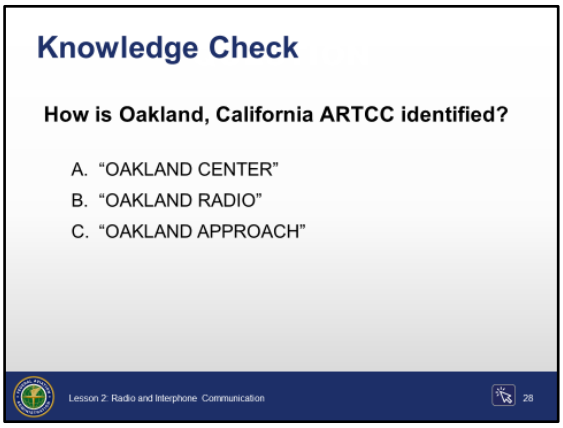
- Airport traffic control towers
  - State the name of the facility followed by the word TOWER
  - Where military and civil airports are located in the same general area and have similar names, state the name of the military service followed by the name of the military facility and the word TOWER
- Air route traffic control centers
  - State the name of the facility followed by the word CENTER
- Approach control facilities, including military approach facilities
  - State the name of the facility followed by the word APPROACH
  - Where military and civil facilities are located in the same general area and have similar names, state the name of the military service followed by the name of the military facility and the word APPROACH
- FAA flight service stations
  - State the name of the station followed by the word RADIO
- Radar facilities having Airport Surveillance Radar (ASR) or Precision Approach Radar (PAR) but not providing approach control service
  - State the name of the facility, followed by the letters G-C-A

Knowledge Check



Question: How does a pilot identify an airport traffic control tower?

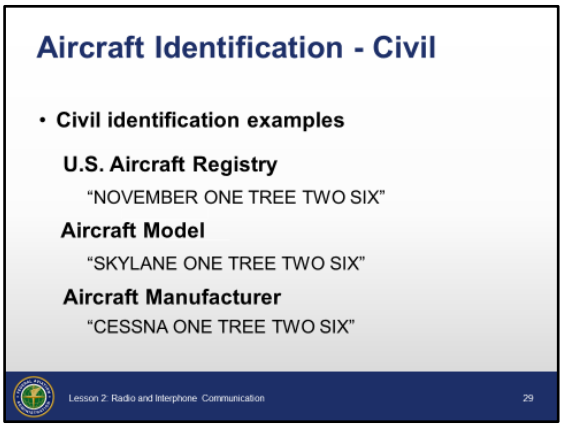
Knowledge Check



Question: How is Oakland, California ARTCC identified?

Aircraft Identification

JO 7110.65, pars. 2-4-8, 2-4-9, 2-4-20

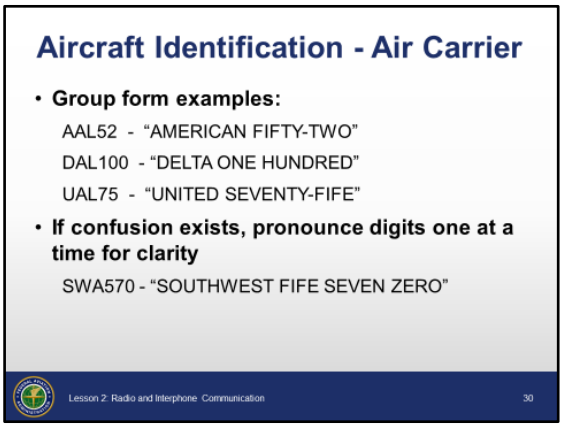


Aircraft Identification - Civil

- ⊙ Initial contact
  - Aircraft identification
    - State the prefix November with U.S. registered aircraft
    - May state the aircraft type, the model, the manufacturer's name if used by the pilot on the initial or subsequent call
    - Include all numbers and/or letters in the aircraft identification

Aircraft Identification (Cont'd)

JO 7110.65, par. 2-4-20



Aircraft Identification - Air Carrier

- For air carrier and other civil aircraft with FAA authorized or ICAO 3LD call signs, state the call sign followed by the flight numbers in group form
  - Group form may be negated by four digit identifiers or the placement of zeros in the identifier
  - If confusion exists stating numbers in group form, pronounce digits one at a time for clarity

Aircraft Identification (Cont'd)

JO 7110.65, par. 2-4-20

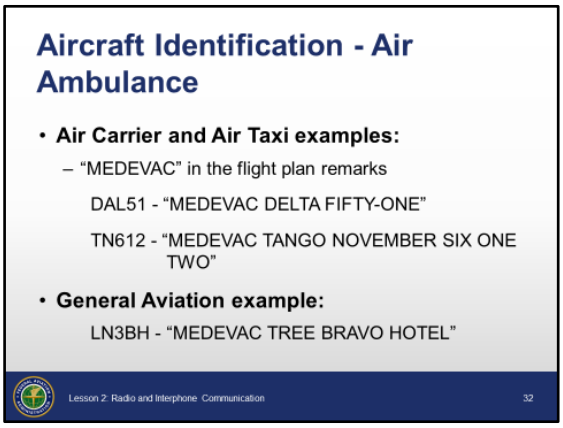
Aircraft Identification - Air Taxi

- For air taxi and commercial operators not having FAA authorized call signs, state the prefix TANGO on initial contact if used by the pilot, followed by registration numbers
  - The prefix may be dropped in subsequent communications

COMMUNICATION PROCEDURES *(CONT'D)*

Aircraft Identification (Cont'd)

JO 7110.65, par. 2-4-20

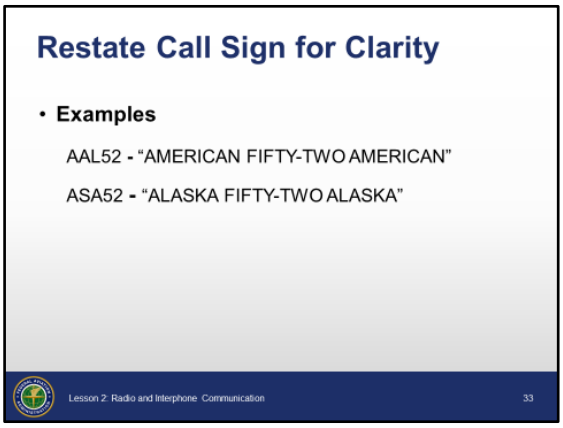


Aircraft Identification - Air Ambulance

- For air carrier ambulance state:
  - Prefix MEDEVAC if used by the pilot followed by call sign and flight numbers in group form
- For air taxi ambulance state
  - Prefix MEDEVAC followed by TANGO and the aircraft registration number
- For civilian air ambulance state:
  - Prefix MEDEVAC followed by the registration numbers and letters

Aircraft Identification (Cont'd)

JO 7110.65, pars. 2-4-15, 2-4-20

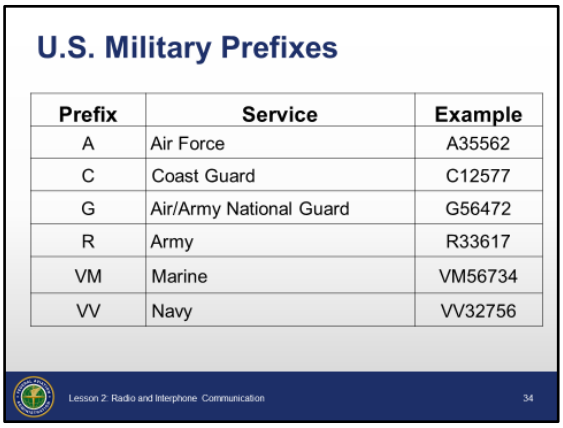


Restate Call Sign for Clarity

- If aircraft identification becomes a problem, the call sign must be restated after the flight number of the aircraft involved
  - This is typically used for similar sounding call signs

U.S. Military Prefixes

JO 7110.65, pars. 2-3-5, 2-4-20



U.S. Military Prefixes

- Military aircraft are identified with prefixes indicating branch of service and/or type of mission

Prefix	Service	Example
A	Air Force	A35562
C	Coast Guard	C12577
G	Air/Army National Guard	G56472
R	Army	R33617
VM	Marine	VM56734
VV	Navy	VV32756

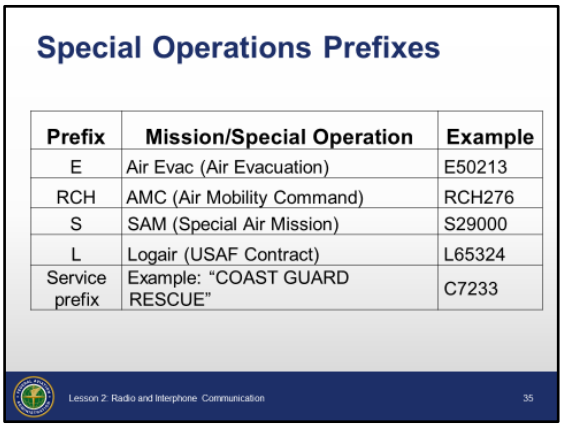
- For military aircraft, state in the following order:
  - Service name
  - Copter when appropriate

  Example:

  R33617 - "ARMY COPTER TREE TREE SIX ONE SEVEN"

U.S. Military (Cont'd)

JO 7110.65, pars. 2-3-5, 2-4-20



Special Operations Prefixes

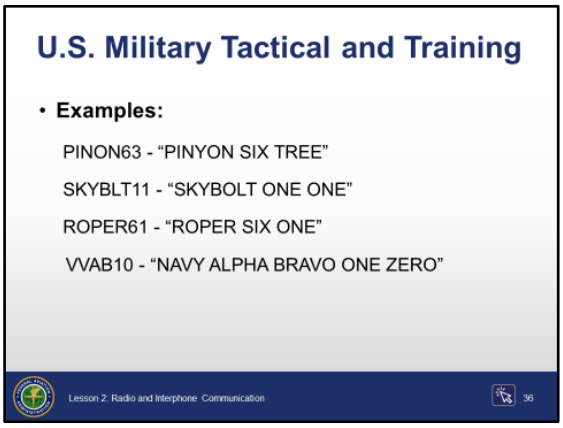
- Special military operations are identified with prefixes indicating the type of mission and/or special operations call sign
- State one of the following followed by up to 5 digits:
  - Air evacuation flights
    - AIR EVAC, MARINE AIR EVAC, or NAVY AIR EVAC
    - Military Air Evacuation flights always use the call sign AIR EVAC even if they are not carrying patients. These flights are only given priority handling when requested by the pilot.
  - Air Mobility Command
    - REACH
  - Special Air Mission
    - SAM
  - USAF contract aircraft
    - LOGAIR
  - Rescue flights
    - (Service name) RESCUE

    Example: "COAST GUARD RESCUE"

NOTE: This is not an all-inclusive list of special operations prefixes.

U.S. Military (Cont'd)

JO 7110.65, pars. 2-3-5, 2-4-20

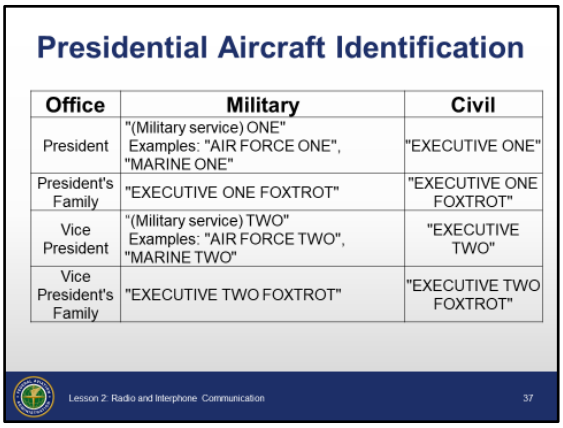


U.S. Military Tactical and Training

- U.S. Air Force, Air National Guard, Military District of Washington priority aircraft, and USAF civil disturbance aircraft
  - Can be identified by using any pronounceable word of 3 to 6 letters followed by a 1 to 5 digit number
- Navy or Marine fleet and training command aircraft
  - The service name and 2 letters, or a digit and a letter (use letter phonetic equivalents), followed by 2 or 3 digits

Presidential Aircraft Identification

JO 7110.65, par. 2-4-20, tables. 2-3-8, 2-3-9

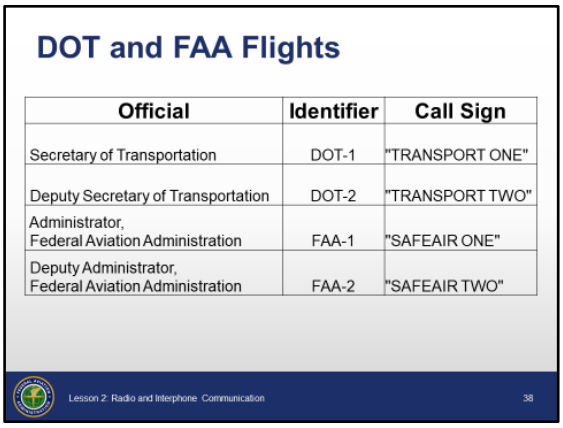


Presidential Aircraft Identification

- President
  - When the President is aboard a military aircraft, state the name of the military service, followed by the word ONE
  - When the President is aboard a civil aircraft, state the words EXECUTIVE ONE
  - When a member of the President's family is aboard any aircraft, if the U.S. Secret Service or the White House Staff determines it is necessary, state the words EXECUTIVE ONE FOXTROT
- Vice President
  - When the Vice President is aboard a military aircraft, state the name of the military service, followed by the word TWO
  - When the Vice President is aboard a civil aircraft, state the words EXECUTIVE TWO
  - When a member of the Vice President's family is aboard any aircraft, if the U.S. Secret Service or the White House Staff determines it is necessary, state the words EXECUTIVE TWO FOXTROT
- Presidential and vice presidential call signs using Air Force aircraft are displayed as AF1 and AF2

DOT and FAA Flights

JO 7110.65, par. 2-4-20



DOT and FAA Flights

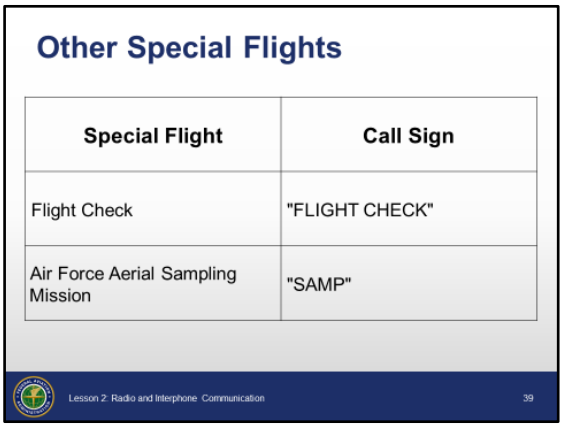
- The table shows alphanumeric identifiers and radio/interphone call signs established for use in air/ground communications when the Secretary of Transportation, Deputy Secretary of Transportation, FAA Administrator or FAA Deputy Administrator have a requirement to identify themselves

Official	Identifier	Call Sign
Secretary of Transportation	DOT-1	"TRANSPORT ONE"
Deputy Secretary of Transportation	DOT-2	"TRANSPORT TWO"
Administrator, Federal Aviation Administration	FAA-1	"SAFEAIR ONE"
Deputy Administrator, Federal Aviation Administration	FAA-2	"SAFEAIR TWO"

Other Special Flights

JO 7110.65, par. 2-4-20

JO 7210.3, par. 5-3-2



Other Special Flights

- ⊙ Flight inspections of navigational aids
  - State the call sign FLIGHT CHECK (prefix FLC) followed by the digits of the registration number

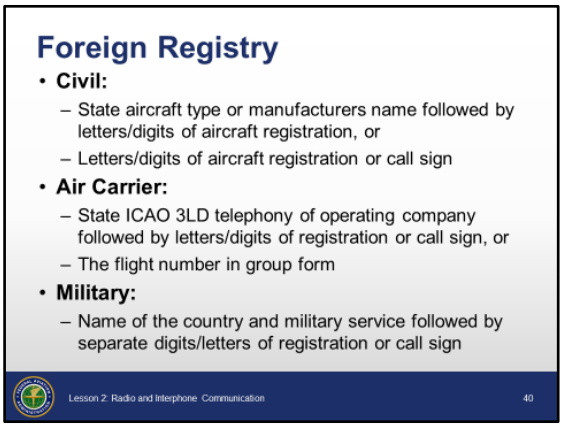
    Example: "FLIGHT CHECK TREE NINER SIX FIFE"
- ⊙ USAF aircraft engaged in aerial sampling/surveying for nuclear contamination
  - State the call sign SAMP followed by the last three digits of the serial number

    Example: "SAMP TREE TWO FIFE"
- ⊙ Use a pilot's name to identify an aircraft only in special or emergency situations

NOTE: This is not an all-inclusive list of possible special flight call signs.

Foreign Registry

JO 7110.65, par. 2-4-20



Foreign Registry

- ⊙ Civil
  - State aircraft type, or manufacturers name followed by letters/digits of aircraft registration, or
  - Letters/digits of aircraft registration or call sign

    Examples: "STATIONAIR F-L-R-B", *or*

    "CHARLIE FOXTROT LIMA ROMEO BRAVO"

NOTE: Letters may be spoken individually or phonetically.

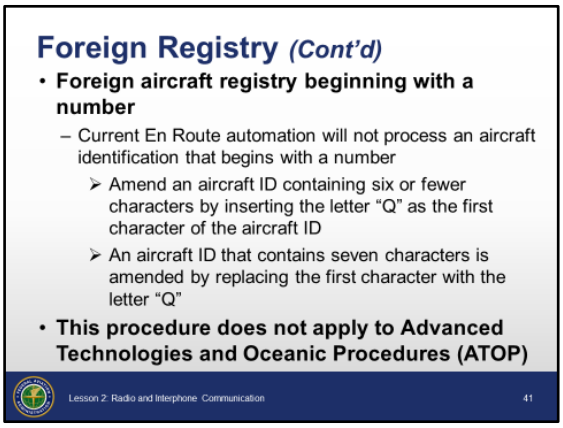
- ⊙ Air carrier
  - State associated ICAO 3LD telephony of operating company followed by letters or digits of registration or call sign

    Example: "AEROMEXICO X-A-M-A-Z"

  - The flight number in group form, or separate digits if that is the format used by the pilot
- ⊙ Military
  - Name of the country and military service followed by separate digits and/or letters of registration or call sign
- ⊙ For military services listed in FAA Order JO 7340.2, the approved telephony followed by the separate digits of the serial number

COMMUNICATION PROCEDURES *(CONT'D)*

Foreign Registry (Cont'd)

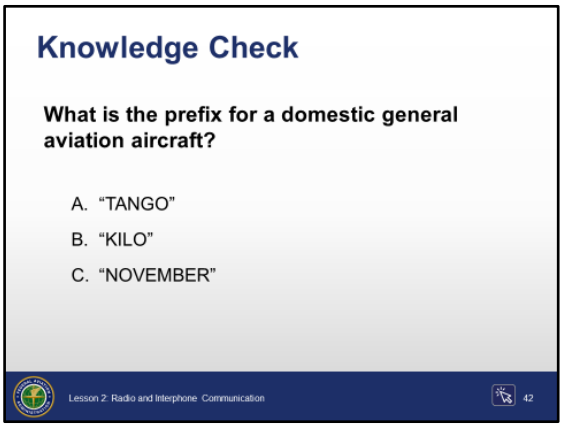


- Foreign aircraft registry beginning with a number
  - Current en route automation will not process an aircraft identification that begins with a number
  - Amend an aircraft ID containing six or fewer characters by inserting the letter "Q" as the first character of the aircraft ID

    Example: 9HRA is amended to Q9HRA
  - An aircraft ID that contains seven characters is amended by replacing the first character with the letter "Q"

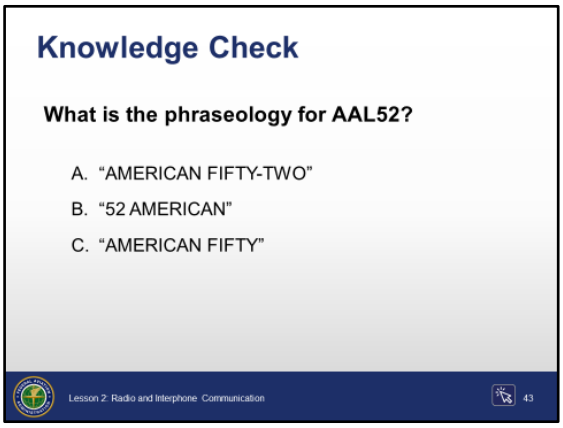
    Example: 2TRAVSA is amended to QTRAVSA
- Do not use the "Q" prefix when communicating with the aircraft
- Unless otherwise specified in a Standard Operating Procedure, verbally coordinate the aircraft's actual Aircraft Identification (ACID) when conducting interfacility transfers of control
- Verbally coordinate the aircraft's ACID when conducting interfacility transfers of control
- This procedure does not apply to Advanced Technologies and Oceanic Procedures (ATOP) sectors, as ATOP is able to process an ACID that begins with a number

Knowledge Check



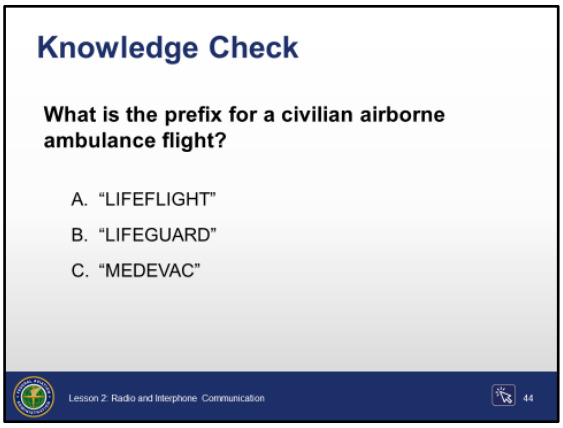
Question: What is the prefix for a domestic general aviation aircraft?

Knowledge Check



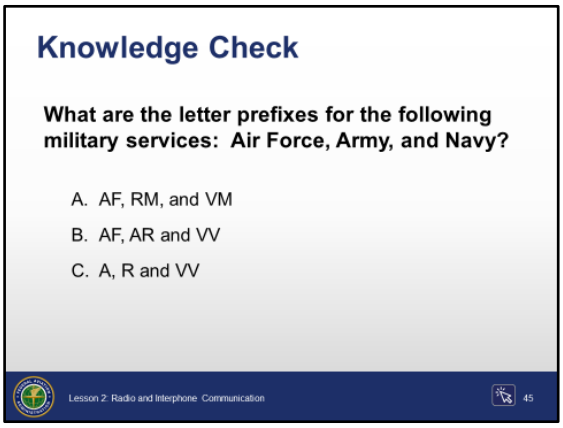
Question: What is the phraseology for AAL52?

Knowledge Check



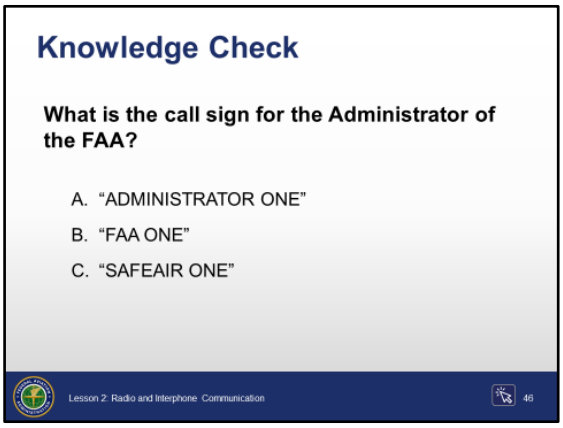
Question: What is the prefix for a civilian airborne ambulance flight?

Knowledge Check



Question: What are the letter prefixes for the following military services: Air Force, Army, and Navy?

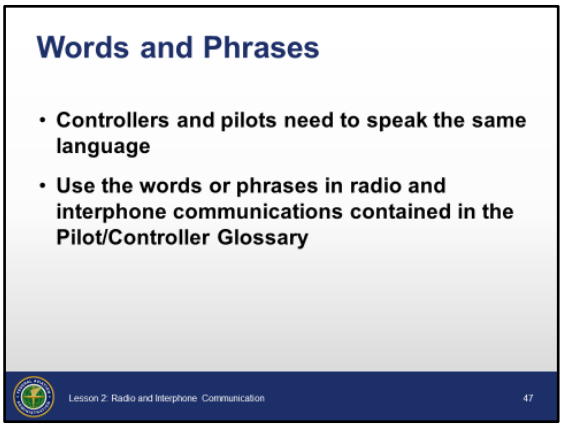
Knowledge Check



Question: What is the call sign for the Administrator of the FAA?

Words and Phrases

JO 7110.65, par. 2-4-14, PCG

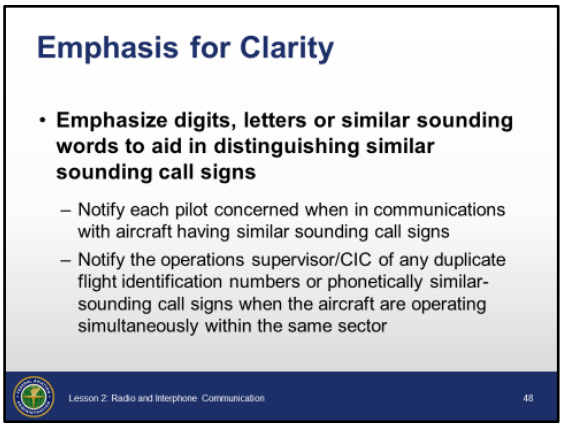


Words and Phrases

- Controllers and pilots need to speak the same language
- Use the words or phrases in radio and interphone communications contained in the Pilot/Controller Glossary
  - Additional words and phrases can be found in the appendix at the end of this lesson
  - En route controllers may omit the words HEAVY or SUPER in communications, except when:
    - Issuing traffic advisories
    - Coordinating with a terminal facility about super or heavy jet operations
    - Coordination about super or heavy jet aircraft at an airport where an en route facility provides approach control service
    - Coordination about super or heavy jet aircraft when separation may become less than five miles by an approved procedure
- When communicating with Air Force One or Air Force Two do not use HEAVY, regardless of aircraft type

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 communications with aircraft having similar sounding call signs

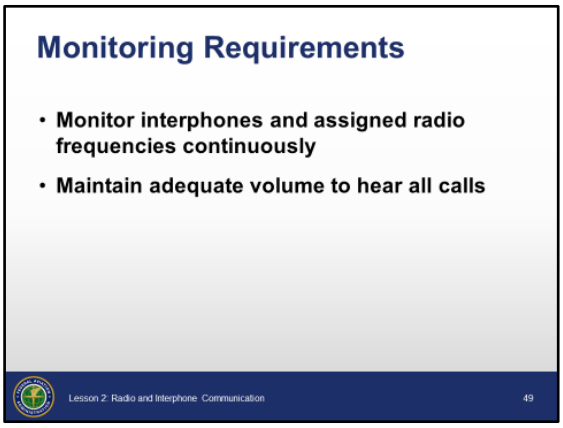
  Example: "AMERICAN FORTY-TWO TWENTY-ONE AMERICAN, BE ADVISED UNITED TWO TWENTY-ONE IS ON FREQUENCY, ACKNOWLEDGE"

  Example: "UNITED THIRTY-ONE UNITED, DELTA THIRTY-ONE IS ALSO ON THIS FREQUENCY, ACKNOWLEDGE"

- Notify the supervisor/CIC of any duplicate flight identification numbers or phonetically similar-sounding call signs when the aircraft are operating simultaneously within the same sector

Monitoring Requirements

JO 7110.65, par. 2-4-2

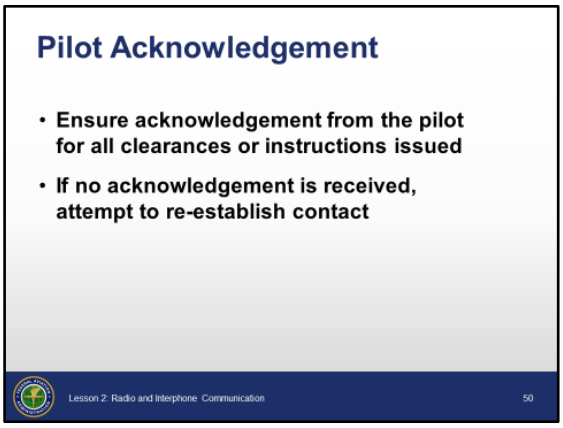


Monitoring Requirements

- Monitor interphones and assigned radio frequencies continuously
- Maintain adequate volume to hear all calls

Pilot Acknowledge-ment

JO 7110.65, par. 2-4-3

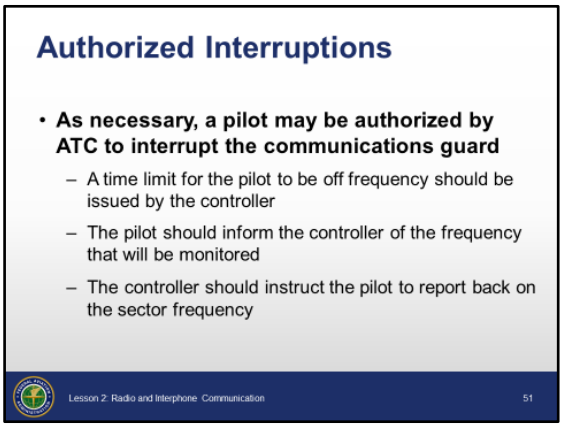


Pilot Acknowledgement

- ⊙ Ensure pilots acknowledge all Air Traffic Clearances and ATC Instructions. When a pilot reads back an Air Traffic Clearance or ATC Instruction:
  - Ensure that items read back are correct
  - Ensure pilots use call signs and/or registration numbers in any read back acknowledging an Air traffic clearance or ATC instruction
  - Although pilots should read back the numbers, unless otherwise required by procedure or controller request, pilots may acknowledge clearances, control instructions, or other information by using WILCO, ROGER, AFFIRMATIVE, or other words or remarks with their aircraft identification
  - Altitudes contained in charted procedures, such as departure procedures, instrument approaches, etc., need not be read back unless they are specifically stated by the controller
  - Until a pilot acknowledges a controller's clearance or instruction, a controller cannot know if a pilot will comply with the clearance or remain as previously cleared
- ⊙ If no acknowledgment is received, attempt to re-establish contact

Authorized Interruptions

JO 7110.65, par. 2-4-4



Authorized Interruptions

- ⊙ As necessary, a pilot may be authorized by ATC to interrupt the communications guard
  - A time limit for the pilot to be off frequency should be issued by the controller
  - Pilot should inform the controller of the frequency that will be monitored
  - The controller should instruct the pilot to report back on the sector frequency

Authorized Transmis-sions

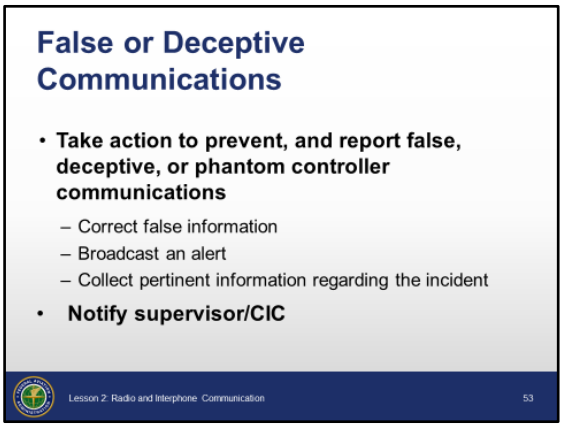
JO 7110.65, par. 2-4-5

Authorized Transmissions

- ⊙ Transmit only those messages:
  - Necessary for air traffic control
  - That contribute to air safety

False or Deceptive Communica-tions

JO 7110.65, par. 2-4-6



False or Deceptive Communications

⊙ 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 or phantom transmissions have been received

  Example: "ATTENTION ALL AIRCRAFT. FALSE ATC INSTRUCTIONS HAVE BEEN RECEIVED IN THE AREA OF LONG BEACH AIRPORT. EXERCISE EXTREME CAUTION ON ALL FREQUENCIES AND VERIFY INSTRUCTIONS."

- Collect pertinent information regarding the incident

⊙ Notify the supervisor/CIC of the false, deceptive, or phantom transmission and report all relevant information pertaining to the incident

Authorized Relays

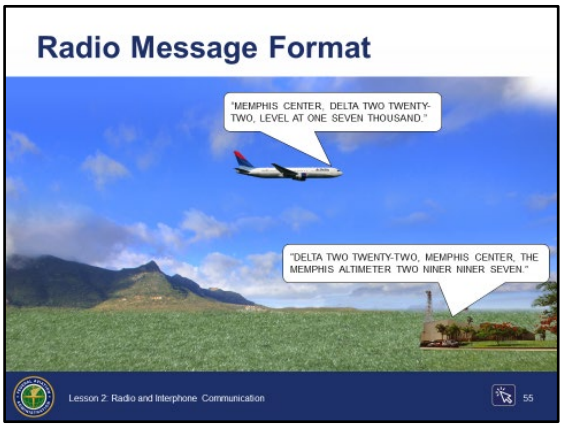
JO 7110.65, par. 2-4-7

Authorized Relays

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

Radio Message Format

JO 7110.65, par. 2-4-8

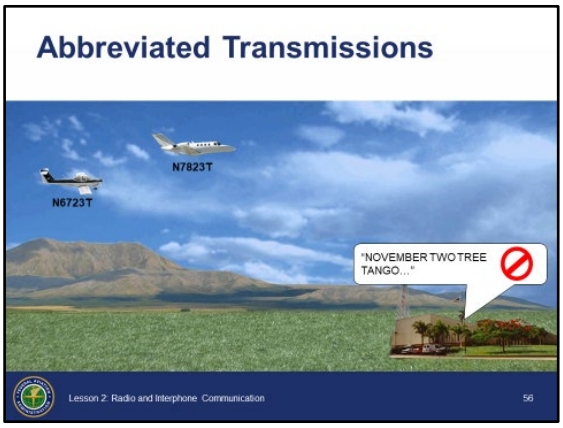


Radio Message Format

- Initiate communications with an aircraft using the following format:
  - Sector/position on initial radio contact states:
    - Identification of aircraft
    - Identification of ATC unit
    - Message (if any)
    - The word OVER, if required
- Subsequent transmissions from the same sector/position
  - Must use the same format, except the identification of the ATC unit may be omitted
- Always preface any clearances, instructions, or communication with the identification of that aircraft

Radio Message Format (Cont'd)

JO 7110.65, par. 2-4-9



Abbreviated Transmissions

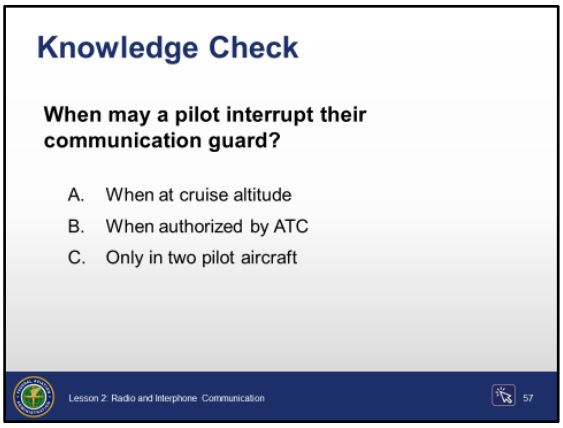
- Use the identification prefix and the last 3 digits or letters of the aircraft identification after communications have been established
  - Do not abbreviate:
    - Similar sounding call signs
    - Air carriers
    - Civil aircraft that have an ICAO 3LD or FAA authorized call sign
    - Aircraft with military call signs
- Omit facility identification after communication is established
- Transmit message immediately after call-up (without waiting for the aircraft's reply) when:
  - Message is short
  - Receipt is generally assured

NOTE: If the message is long or requires writing, inform the pilot before giving the message.

Example: "N783T I HAVE A MESSAGE FOR YOU, ADVISE WHEN READY TO COPY."

- Omit the word OVER if message obviously requires a reply

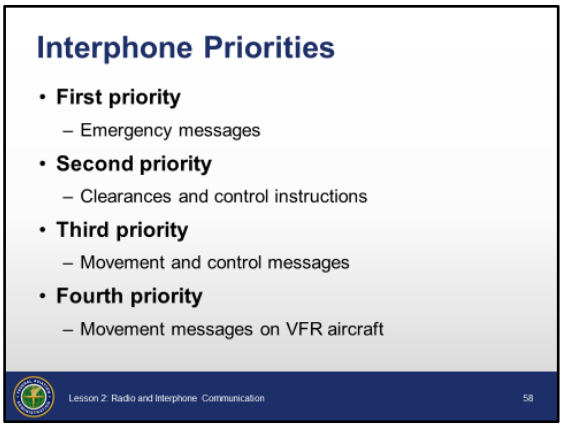
Knowledge Check



Question: When may a pilot interrupt their communication guard?

Interphone Priorities

JO 7110.65, par. 2-4-10

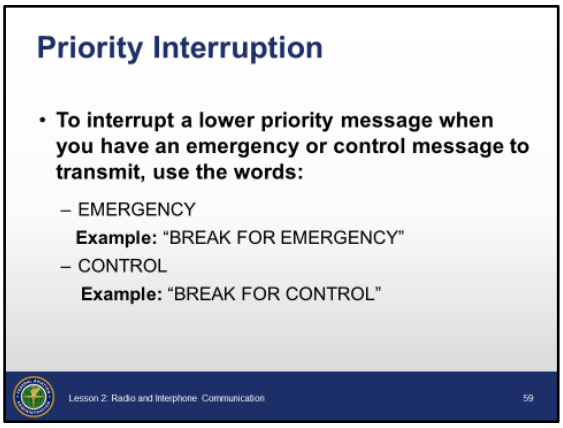


Interphone Priorities

- First priority
  - Emergency messages, including:
    - Essential information on aircraft accidents or suspected accidents
    - After an actual emergency has passed, give a lower priority to messages relating to that accident
- Second priority
  - Clearances and control instructions
- Third priority
  - Movement and control messages in the following order of preference:
    - Progress reports
    - Departure or arrival reports
    - Flight plans
- Fourth priority
  - Movement messages on VFR aircraft

Interphone Priorities (Cont'd)

JO 7110.65, par. 2-4-11



Priority Interruption

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

- EMERGENCY

Example: "BREAK FOR EMERGENCY"

- CONTROL

Example: "BREAK FOR CONTROL"

Interphone Message Format

JO 7110.65, pars. 2-4-12, 2-4-13

Interphone Message Format

⊙ Use the following format for inter/intrafacility communications

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

NOTE: If the facilities utilize numeric position identification, the caller must identify both the facility and the position on interfacility calls.

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

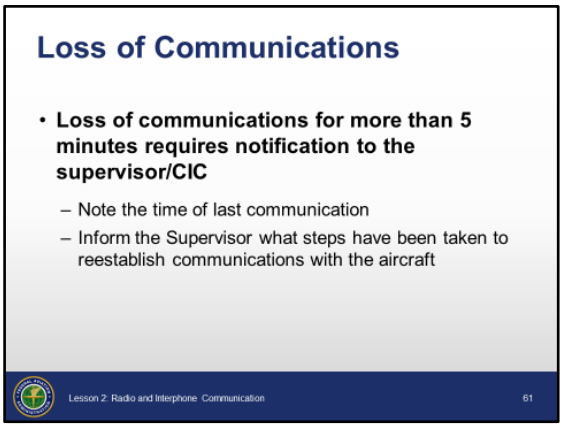
  Example: HANDOFF or APREQ
- Sometimes it may be more advantageous to include this after identification of position calling; (e.g., "ROCKET, SMYRNA, NINETY LINE, POINT OUT")
- Caller states message
- Receiver states response to the caller's message followed by receiver's operating initials
- Caller states operating initials
  - Terminate all interphone messages with your operating initials

COMMUNICATION PROCEDURES *(CONT'D)*

Loss of Communica-tions

JO 7110.65, par. 2-1-26

JO 7610.4, par. 7-3-1

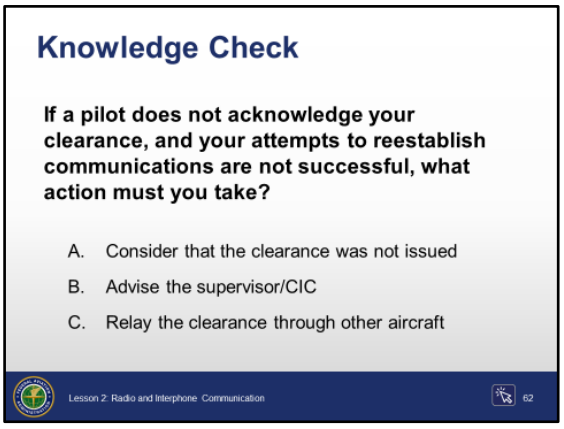


Loss of Communications

- In the event that radio communication is lost, or not established, ATC will consider any IFR aircraft that is No Radio (NORDO) for more than 5 minutes as suspicious and must notify the supervisor/CIC
  - Note the time of last communication
  - Inform the supervisor/CIC what steps have been taken to reestablish communications with the aircraft

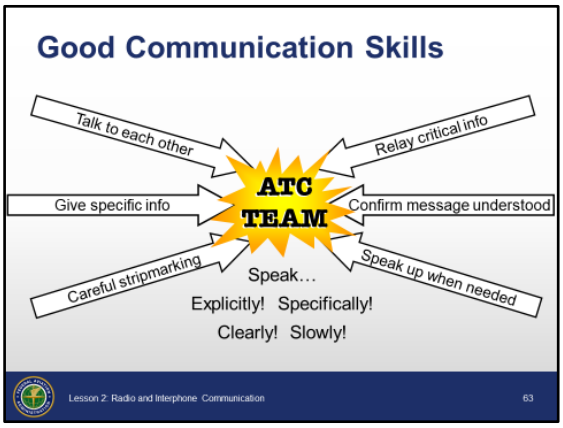
COMMUNICATION PROCEDURES *(CONT'D)*

Knowledge Check



Question: If a pilot does not acknowledge your clearance, and your attempts to reestablish communication are not successful, what action must you take?

Good Communication Skills for ATC Teams



Good Communication Skills

- Communication skills for ATC teams include the ability to:
  - Communicate effectively
  - Resolve conflict
  - Manage team resources
- ATC teams with good communication skills:
  - Talk to each other about what they are:
    - Thinking and planning
    - Doing or have done
  - Give each other enough specific information to avoid confusion
  - Communicate through careful strip marking
  - Speak up when needed (e.g., point out something, ask a teammate to do something, ask a question for clarification)
  - Speak:
    - Explicitly and specifically (e.g., use aircraft call signs)
    - Clearly and slowly enough to be understood
  - Get confirmation that their messages are understood
  - Relay critical information quickly

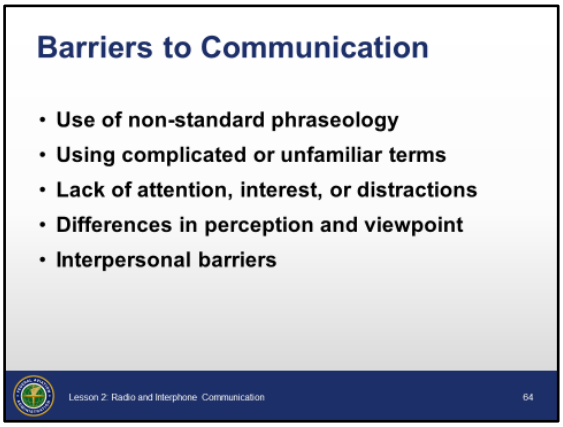
Continued on next page

COMMUNICATION PROCEDURES *(CONT'D)*

Good Communication Skills for ATC Teams (Cont'd)

- To receive information accurately:
  - Verify receipt of verbal and non-verbal messages
  - Ask questions related to verbal/non-verbal messages when received messages are unintelligible or confusing
  - Provide constructive feedback
  - Solicit from the team members more information as needed about a situation

Barriers to Communication



Barriers to Communication

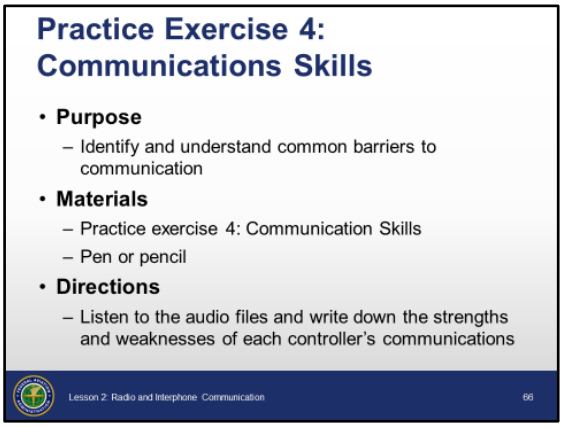
- A communication barrier is anything that prevents you from receiving and understanding the messages others use to convey their information, ideas and thoughts including things like:
  - The use of non-standard phraseology
  - Using complicated or unfamiliar terms
  - Lack of attention, interest, or distractions
  - Differences in perception and viewpoint
  - Interpersonal barriers
- A breakdown in communication may have an adverse effect on many things such as:
  - Communication between controllers
  - Communication between controllers and pilots
  - Situational awareness
  - Decision making
  - Monitoring of pilot actions
  - Not wanting to take responsibility

Controller Responsi-bilities in Communica-tion

Controller Responsibilities

- In all communication:
  - Both the speaker and listener must focus and communicate in such a way that the message is clearly understood and remembered
  - Use the appropriate communication
  - Maintain a professional attitude
  - Be assertive when necessary
  - Prioritize
    - There are many data items communicated that the controller must be able to identify which are most critical to safety
- When speaking, utilize:
  - Standard phraseology
  - Concise format
  - Clear enunciation
  - Even tone, pitch, and pace
  - Specific and explicit instructions and words
- When listening:
  - Focus, pay attention
  - Use active listening
    - If you are unsure of message/transmission ask for it to be repeated

PRACTICE EXERCISE 4: COMMUNICATIONS SKILLS



Purpose

Identify and understand common barriers to communication.

Materials

Handout

- Practice exercise 4 from lesson 2 handout: Communications Skills
- Pen or pencil

Directions

This exercise takes approximately 15 minutes to complete. Your instructor will play seven audio files for you. As you listen, write down what you think are the strengths and weaknesses of each controller's style of communication. Using the discussion questions that follow as a guide, determine what impact those qualities might have on the effectiveness of communication.

Discussion Questions

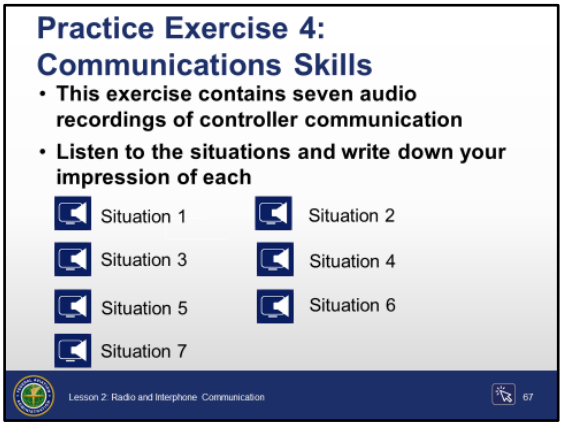
Question: What barriers to communication may be created by the controller's manner of speaking or attitude?

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

Question: What might be causing the person to communicate this way?

PRACTICE EXERCISE 4: COMMUNICATION SKILLS
(CONT'D)

Practice Exercise 4 (Cont'd)



PRACTICE EXERCISE 4: COMMUNICATION SKILLS
(CONT'D)

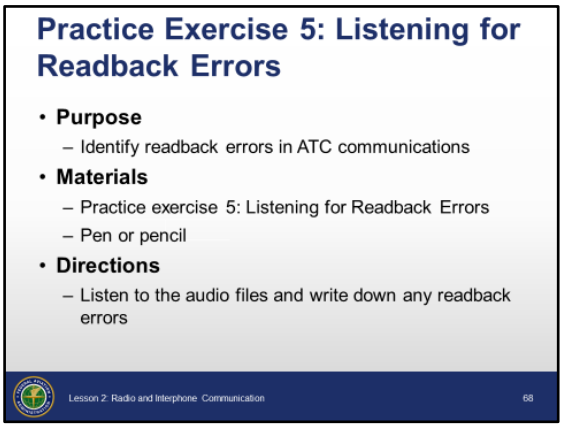
Worksheet		
Controller	**Communications strengths/weaknesses**	**Impact on communication**
1		
2		
3		
4		
5		
6		
7		

Discussion Questions

Question: What are the biggest barriers to communication that you might encounter on the job?

Question: What could you do to remove common barriers to communication?

PRACTICE EXERCISE 5: LISTENING FOR READBACK ERRORS



Purpose

Identify readback errors in ATC communications

Materials

Handout

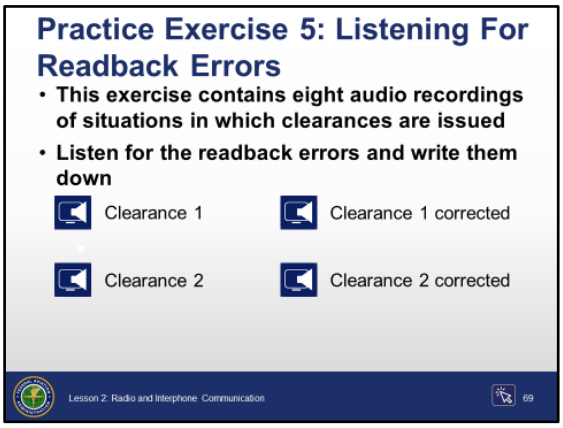
- Practice Exercise 5 of lesson 2 handout: Listening for Readback Errors
- Pen or pencil

Directions

This exercise takes approximately 30 minutes to complete. This exercise contains audio recordings of situations in which numerous clearances are issued. There are eight examples that may include readback or phraseology errors. It is a good idea to write the pilot readback in the worksheet to identify an error. Be prepared to discuss each situation.

PRACTICE EXERCISE 5: LISTENING FOR READBACK ERRORS *(CONT'D)*

Practice Exercise 5 (Cont'd)



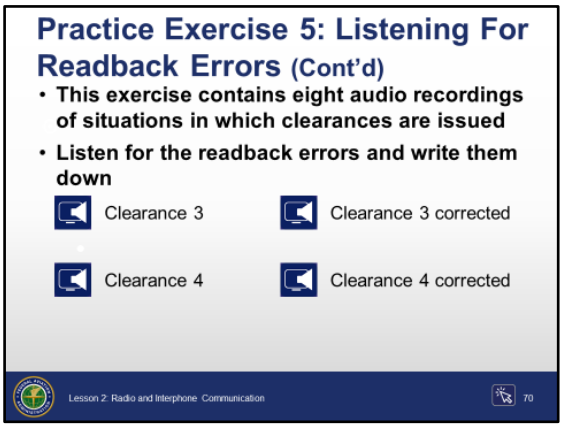
Practice Exercise 5: Listening for Readback Errors

Clearances 1 and 2

1.	Controller	"LN92DF, CROSS SEVEN FIVE SOUTH OF RICHMOND AT FL290"
	Pilot	
	Error	
2.	Controller	"LOBO544, CROSS THREE ZERO MILES SOUTHWEST OF DUPONT AT AND MAINTAIN FL260"
	Pilot	
	Error	

PRACTICE EXERCISE 5: LISTENING FOR READBACK ERRORS *(CONT'D)*

Practice Exercise 5 (Cont'd)



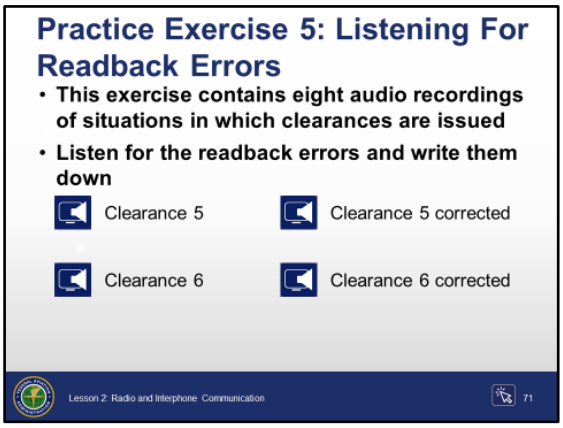
Practice Exercise 5: Listening for Readback Errors

Clearances 3 and 4

3.	Controller	"AAL1, DESCEND AND MAINTAIN ONE TWO THOUSAND"
	Pilot	
	Error	
4.	Controller	"DAL663, CROSS ONE FIVE NORTHEAST OF WATERLOO AT FL180"
	Pilot	
	Error	

PRACTICE EXERCISE 5: LISTENING FOR READBACK ERRORS *(CONT'D)*

Practice Exercise 5 (Cont'd)



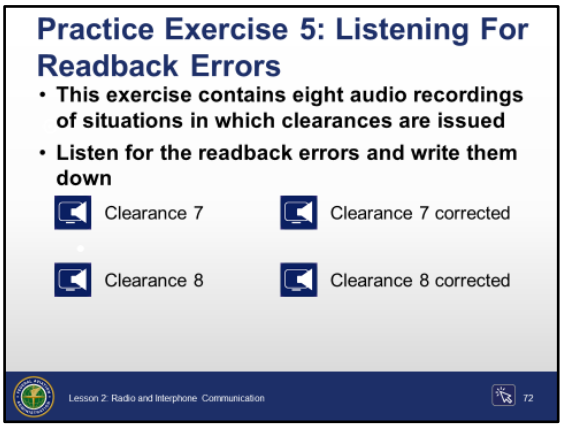
Practice Exercise 5: Listening for Readback Errors

Clearances 5 and 6

5.	Controller	"USA1856, DESCEND TO CROSS TEN EAST OF TAR RIVER FL210"
	Pilot	
	Error	
6.	Controller	"USA1781, CROSS THREE ZERO MILES SOUTHWEST OF DUPONT AT FL260"
	Pilot	
	Error	

PRACTICE EXERCISE 5: LISTENING FOR READBACK ERRORS *(CONT'D)*

Practice Exercise 5 (Cont'd)



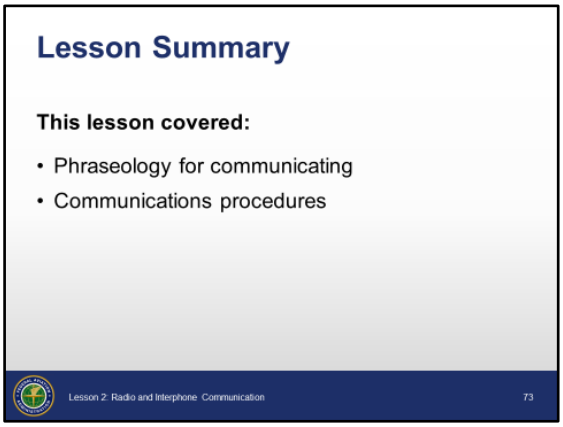
Practice Exercise 5: Listening for Readback Errors

Clearances 7 and 8

7.	Controller	"LEAR ONE THREE DELTA, FLY HEADING ZERO TWO ZERO, VECTORS FOR TRAFFIC"
	Pilot	
	Error	
8.	Controller	"AAL846, CROSS NINER ZERO MILES SOUTHWEST OF ARMEL AT AND MAINTAIN FL270"
	Pilot	
	Error	

CONCLUSION

Lesson Summary



Summary

⊙ Phraseology for communicating

- ICAO phonetics
- Number pronunciation and usage
- Altitudes and flight levels
- MDA/DH altitude
- Time
- Airport elevation
- Altimeter setting
- Surface wind
- Heading
- Beacon code
- Runways
- Frequencies
- Speed and Mach number
- Miles

Continued on next page

CONCLUSION *(CONT'D)*

Lesson Summary (Cont'd)

- Communications procedures
  - Facility identification
  - Aircraft identification
    - Civil
    - Air carrier
    - Air taxi
    - Air ambulance
  - Restate call sign for clarity
  - U.S. military prefixes
  - U.S. military special operations
  - Presidential aircraft
  - DOT and FAA flights
  - Special flights
    - Flight Check
    - SAMP
  - Foreign registry
  - Words and phrases
  - Emphasis for clarity
  - Monitoring requirements
  - Pilot acknowledgement
  - Authorized interruptions
  - Authorized transmissions
  - False or deceptive communications
  - Authorized relays
  - Radio message format
  - Abbreviated transmissions
  - Interphone priorities
  - Priority interruptions

Continued on next page

CONCLUSION *(CONT'D)*

Lesson Summary (Cont'd)

- Interphone message format
- Loss of communications
- Communication skills
- Barriers to communication
- Controller responsibilities in communication

APPENDIX: WORDS AND PHRASES

WORD/PHRASE	MEANING
ACKNOWLEDGE	Let me know that you have received and understood my message.
ADVISE INTENTIONS	Tell me what you plan to do.
AFFIRMATIVE	Yes.
ATC ADVISES	A message of noncontrol information is being relayed to an aircraft by other than an air traffic controller.
ATC CLEARS	An ATC clearance is being relayed to an aircraft by other than an air traffic controller.
ATC REQUESTS	An ATC request is being relayed to an aircraft by other than an air traffic controller.
CLEARED FOR TAKEOFF	ATC authorized an aircraft to depart. It is predicated on known traffic and known physical airport conditions.
CLEARED TO LAND	ATC authorized an aircraft to land. It is predicated on known traffic and known physical airport conditions.
CORRECTION	An error has been made in the transmission and the correct version follows.
EXPEDITE	Prompt compliance is required to avoid the development of an imminent situation.
GO AHEAD	Proceed with your message. (Not to be used for any other purpose.)
HOW DO YOU HEAR ME?	What is the quality of the transmission; how well is the transmission being received?
IMMEDIATELY	Compliance with an action is required to avoid an imminent situation.
I SAY AGAIN	The message will be repeated.
NEGATIVE	“No” or “Permission not granted” or “That is not correct.”
OUT	The conversation is ended and no response is expected.
OVER	My transmission is ended; I expect a response.
READ BACK	Repeat my message back to me.

Continued on next page

APPENDIX: WORDS AND PHRASES *(CONT'D)*

WORD/PHRASE	MEANING
ROGER	I have received all of your last transmission. (Not to be used to answer a question requiring a "yes" or "no" answer.)
SAY AGAIN	Repeat the last transmission. (Usually specifies transmission or portion thereof not understood or received, e.g., "Say again all after ABRAM VOR.")
SPEAK SLOWER	Reduce speech rate.
STAND BY	Controller or pilot must pause for a few seconds, usually to attend to other duties of a higher priority; "Wait" as in "stand by for clearance." (If a delay is lengthy, the caller should re-establish contact.)
THAT IS CORRECT	The understanding you have is right.
VERIFY	Request confirmation of information; e.g., "Verify assigned altitude."
WILCO	I have received your message, understand it, and will comply with it.