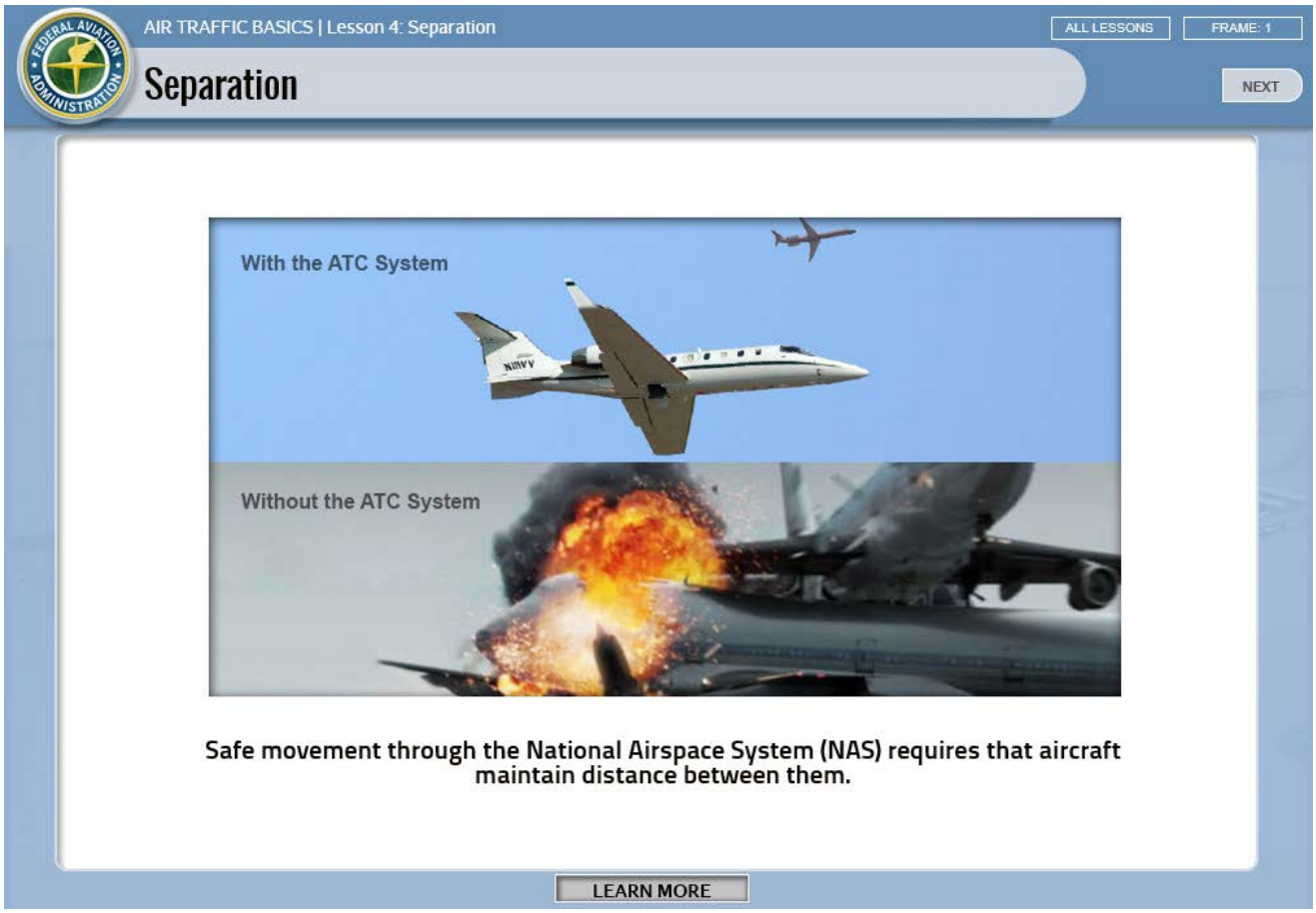
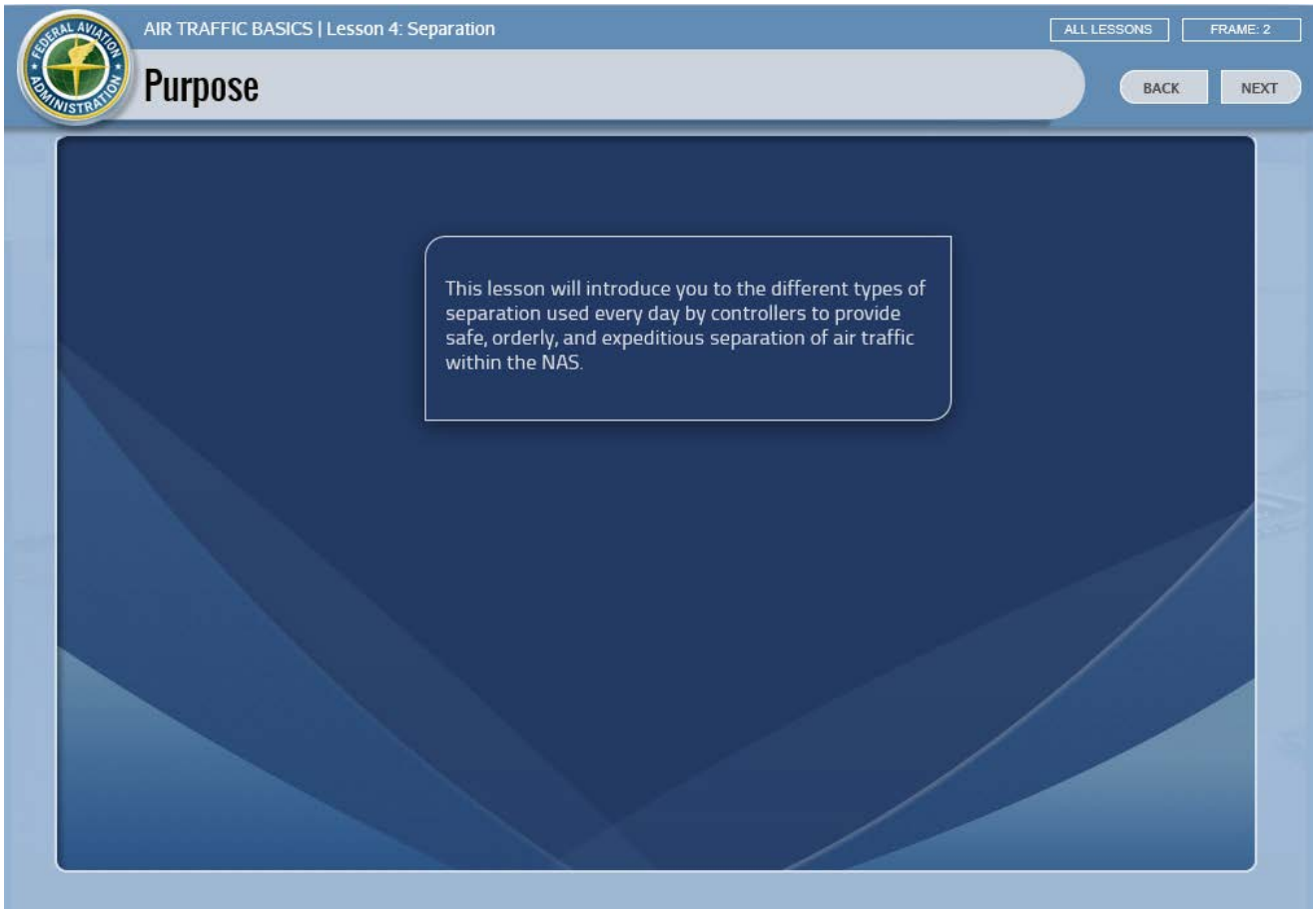
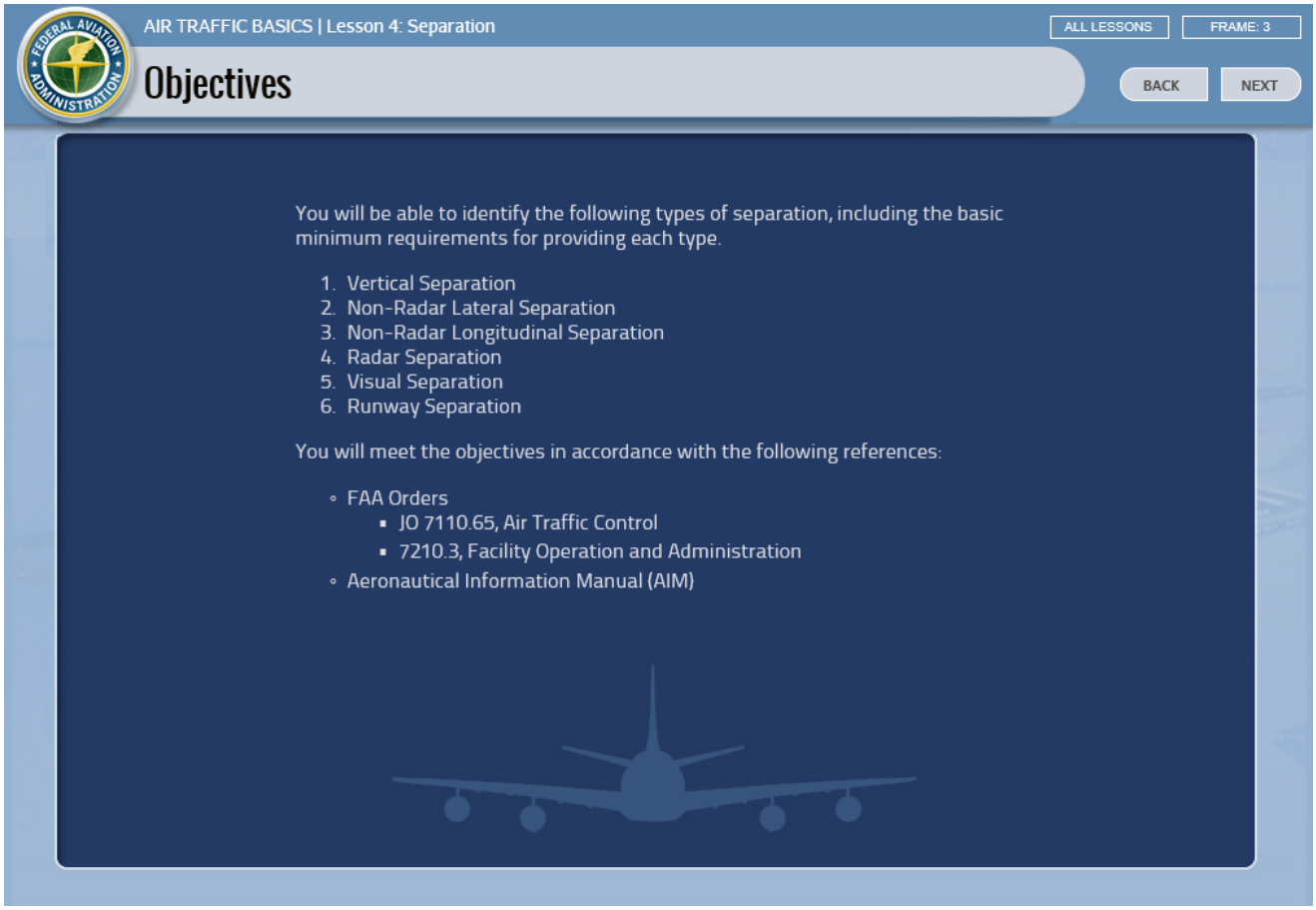


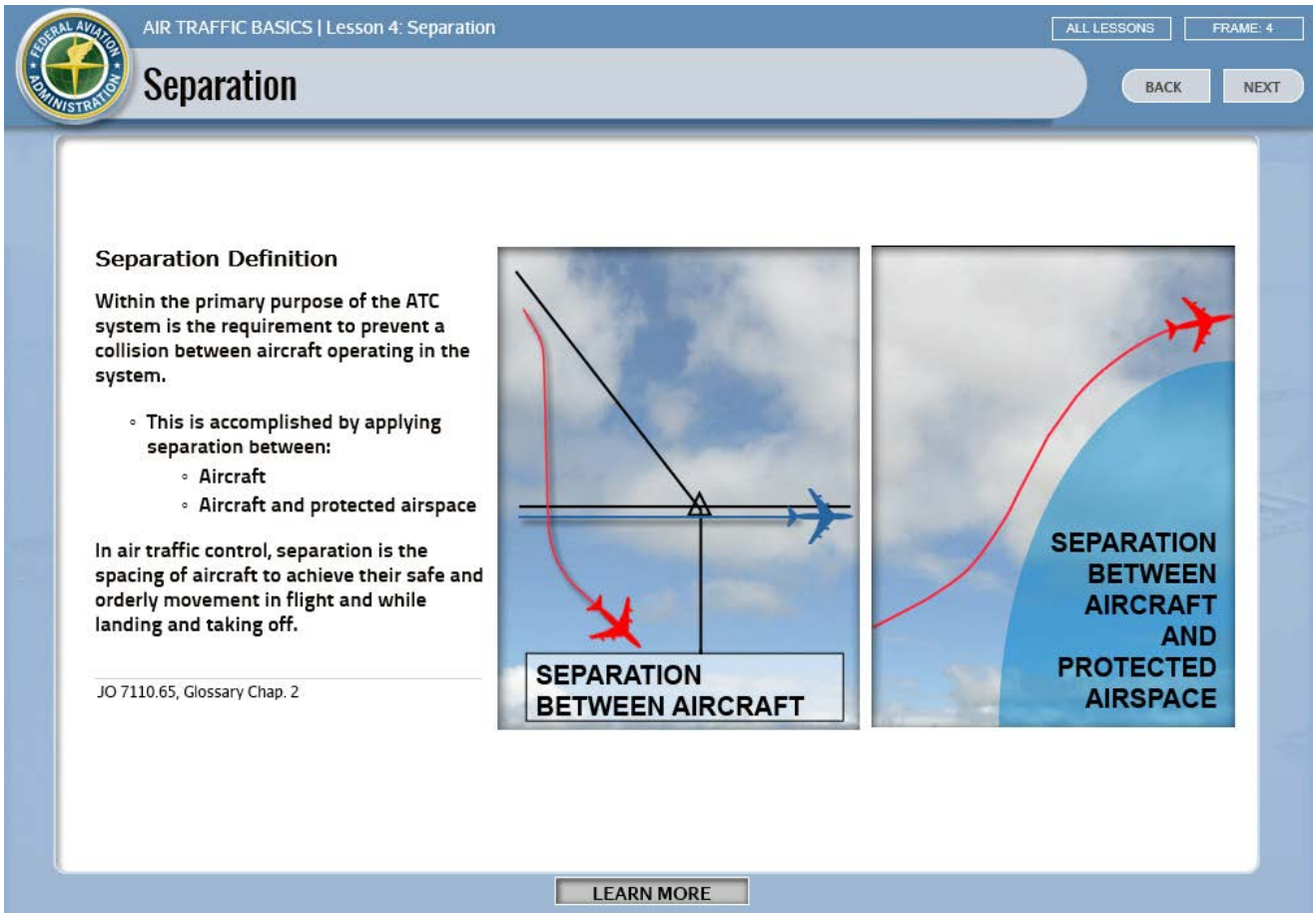
In Air Traffic Control (ATC), separation refers to keeping aircraft spaced appropriately. A controller's primary responsibility is to ensure separation of aircraft.

To effectively provide ATC service and issue appropriate ATC clearances, you must understand all separation rules and know how to apply them. Failure to apply proper separation can result in catastrophes.

In 2008, there were in excess of 140 million operations controlled by all FAA facilities. Each aircraft received a clearance requiring some type of separation.


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 2
Purpose
BACK
NEXT
This lesson will introduce you to the different types of separation used every day by controllers to provide safe, orderly, and expeditious separation of air traffic within the NAS.


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 3
Objectives
BACK
NEXT
You will be able to identify the following types of separation, including the basic minimum requirements for providing each type.
1. Vertical Separation
2. Non-Radar Lateral Separation
3. Non-Radar Longitudinal Separation
4. Radar Separation
5. Visual Separation
6. Runway Separation
You will meet the objectives in accordance with the following references:
◦ FAA Orders
▪ JO 7110.65, Air Traffic Control
▪ 7210.3, Facility Operation and Administration
◦ Aeronautical Information Manual (AIM)


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 4
Separation
BACK
NEXT
Separation Definition
Within the primary purpose of the ATC system is the requirement to prevent a collision between aircraft operating in the system.
◦ This is accomplished by applying separation between:
◦ Aircraft
◦ Aircraft and protected airspace
In air traffic control, separation is the spacing of aircraft to achieve their safe and orderly movement in flight and while landing and taking off.
JO 7110.65, Glossary Chap. 2
SEPARATION BETWEEN AIRCRAFT
SEPARATION BETWEEN AIRCRAFT AND PROTECTED AIRSPACE
LEARN MORE

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 5

Separation

BACK NEXT

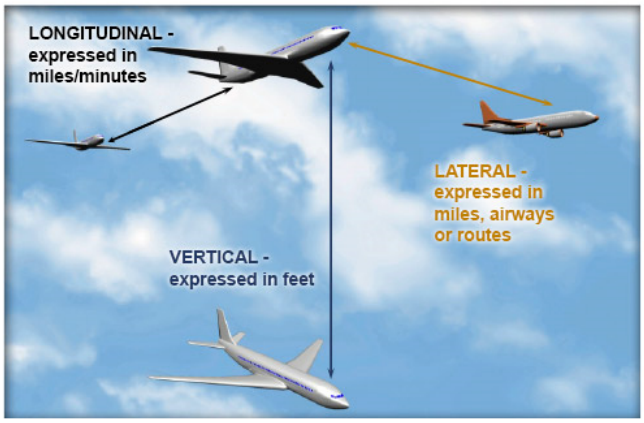
Separation Minima

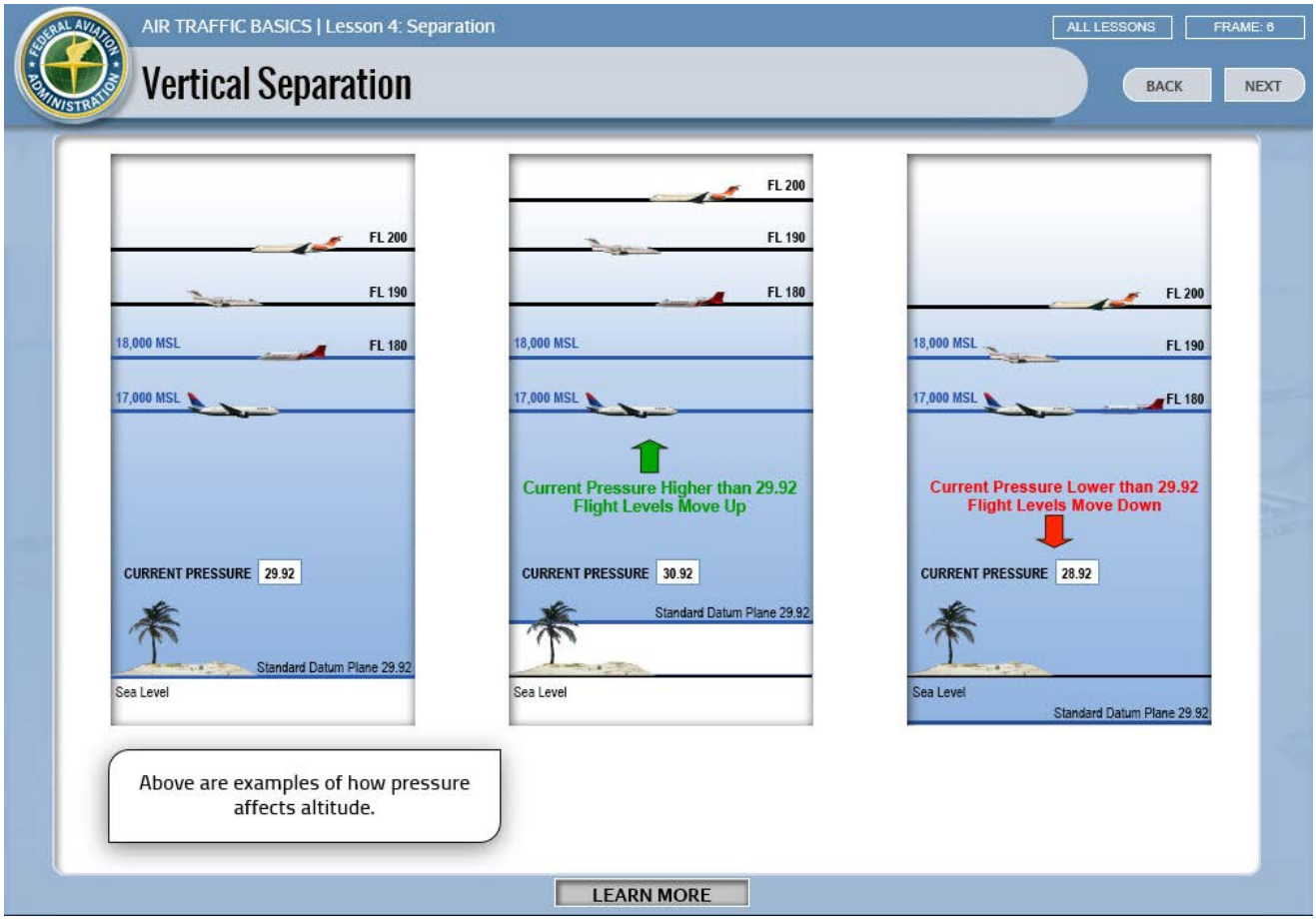
In a radar or non-radar environment, aircraft can be separated:

- **Vertically**
- **Laterally**
- **Longitudinally**

NOTE: Vertical, lateral, and longitudinal separation are applied in both radar and non-radar environments, but there are different minimum distances (separation minima) used depending on whether it is a radar or non-radar environment.

Separation minima are the minimum longitudinal, lateral, or vertical distances by which aircraft are spaced through the application of air traffic control procedures.





Flight Level Definition

To understand vertical separation, you must have an understanding of Flight Levels.

Flight Level (FL) is a level of constant atmospheric pressure related to a reference datum of 29.92 inches of mercury. Each is stated in three digits that represent hundreds of feet. For example, FL250 represents a barometric altimeter indication of 25,000 feet; FL255, an indication of 25,500 feet.

All aircraft operating at or above 18,000 MSL shall have the altimeter set to 29.92, regardless of the local altimeter settings at stations they fly over.

In layman's terms, an aircraft's flight level is an altitude referencing a standard barometric pressure. (Altitude is usually measured using an altimeter, which is essentially a calibrated barometer – it measures air pressure.)

Aircraft travelling long distances and at higher speeds need to use a standard measurement because:

- It is impractical to assign a new altimeter setting every 100 miles.
- If aircraft do not use the same setting, safety issues arise.
  - Two aircraft would be flying at different heights, even though their altimeters show the same altitude.
  - Two aircraft could be flying at the same height, even though their altimeters show different altitudes.

Example:

An aircraft level at FL300 in a geographic location experiencing a barometric pressure of 29.42 is actually at 29,500 feet MSL. However, other aircraft in the vicinity are affected similarly, resulting in constant vertical positioning relative to each other.

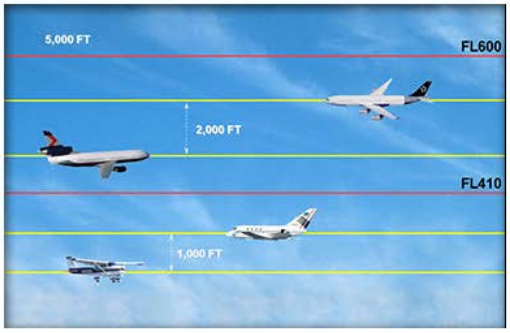
Reference: JO 7110.65, Glossary AIM, Chap. 7

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 7

Vertical Separation

BACK NEXT



Vertical Separation

Vertical Separation is the vertical spacing of aircraft achieved by the assignment of different altitudes or Flight Levels used with radar or non-radar procedures.

Instrument Flight Rules (IFR) aircraft are assigned different altitudes/Flight Levels to meet standard separation requirements.

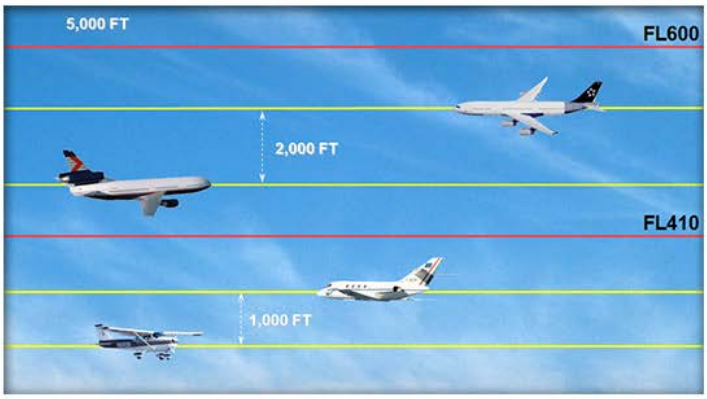
JO 7110.65, Glossary

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 8

Vertical Separation

BACK NEXT



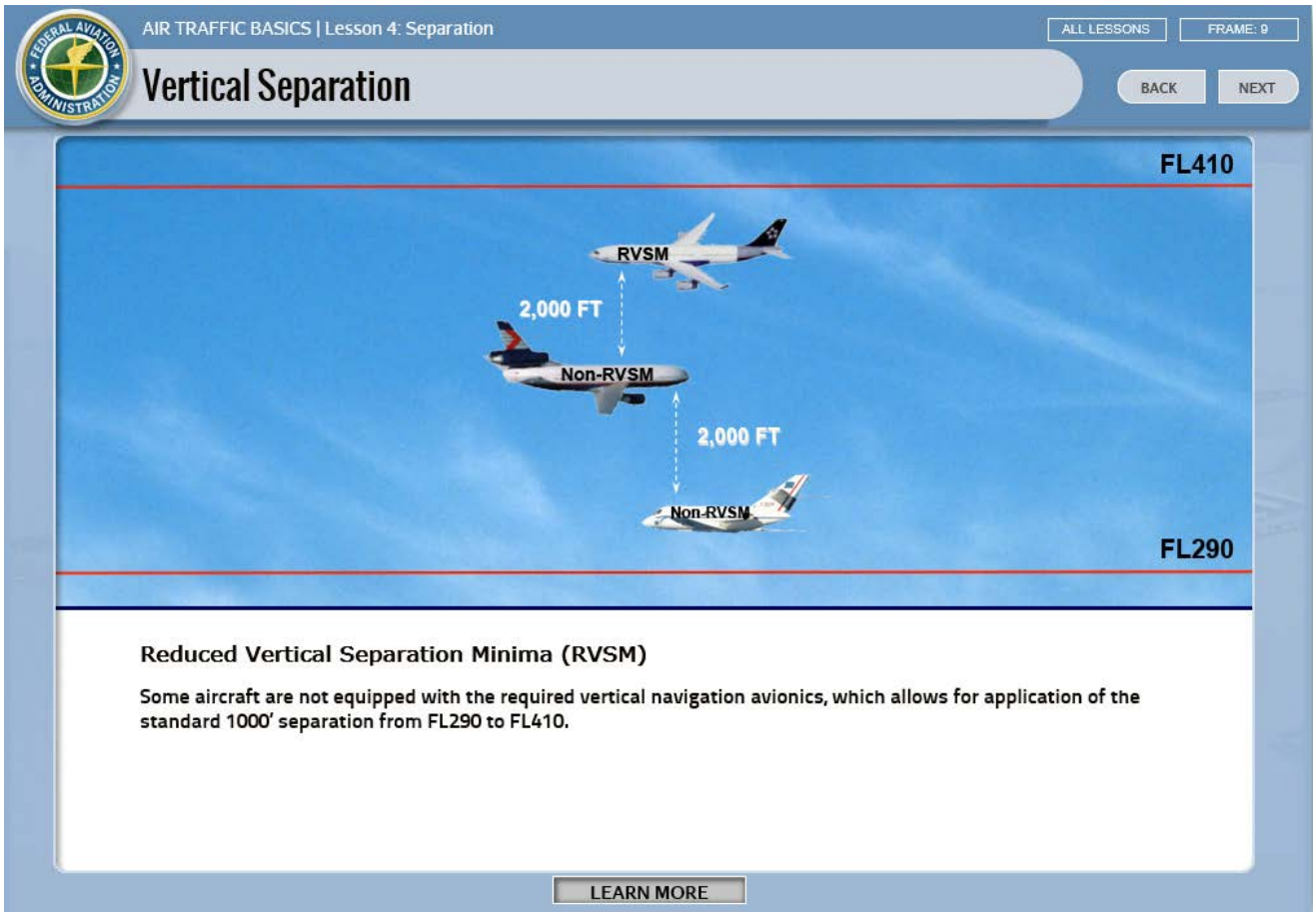
Vertical Minima

The basic minimum altitude separation between IFR aircraft is:

- **1,000 feet for aircraft up to and including FL410**
- **2,000 feet for aircraft above FL410 up to and including FL600**
- **5,000 feet for aircraft flying above FL600**

JO 7110.65, Chap. 4

NOTE: The separation minima increase with altitude because altimeter errors are more likely at higher altitudes, so greater separation is needed.

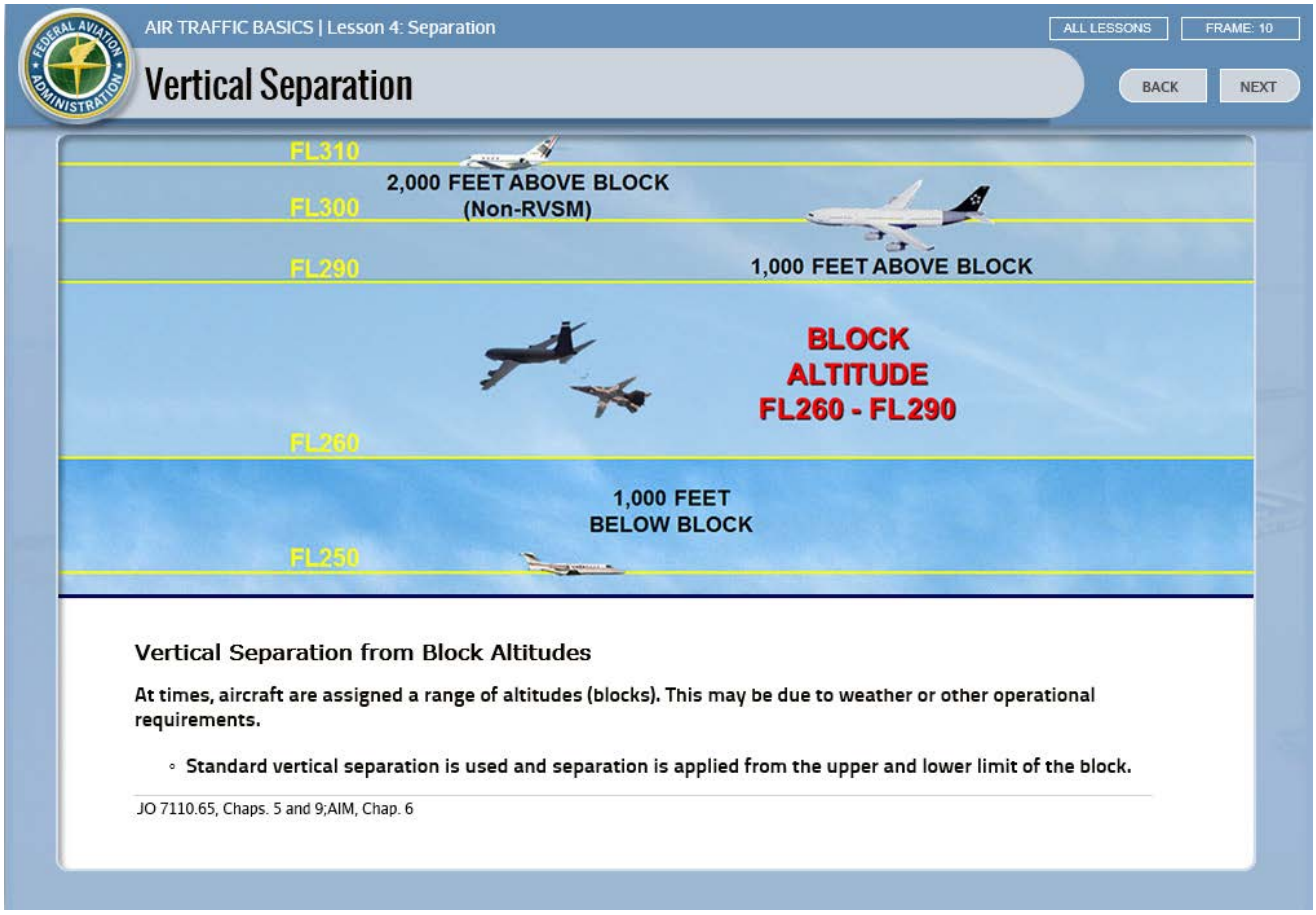


- These aircraft are referred to as "non-RVSM" (reduced vertical separation minima).
- These aircraft must be assigned FL280 or lower, or FL430 or higher.
- Non-RVSM aircraft may only **climb** or **descend** through RVSM altitudes (FL290 to FL410). While transiting this airspace, 2000' vertical separation must be maintained with all other aircraft.

Exceptions: The following aircraft may be assigned altitudes between FL290 and FL410 without RVSM equipment, but require 2,000 vertical separation:

- Department of Defense (DOD) aircraft
- Lifeguard air ambulance aircraft
- Aircraft flown by manufacturers for certification and development
- Foreign state aircraft
- Most NASA aircraft
  - Application of RVSM separation standards to formation flights is dependent upon the RVSM status of all aircraft involved. RVSM separation is only applied to formation flights consisting of all RVSM approved aircraft.

Reference: JO 7110.65, Chap. 2 and 4


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 10
Vertical Separation
BACK
NEXT
FL310
2,000 FEET ABOVE BLOCK
(Non-RVSM)
FL300
FL290
1,000 FEET ABOVE BLOCK
BLOCK
ALTITUDE
FL260 - FL290
FL260
1,000 FEET
BELOW BLOCK
FL250
Vertical Separation from Block Altitudes
At times, aircraft are assigned a range of altitudes (blocks). This may be due to weather or other operational requirements.
◦ Standard vertical separation is used and separation is applied from the upper and lower limit of the block.
JO 7110.65, Chaps. 5 and 9;AIM, Chap. 6

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 11

Vertical Separation

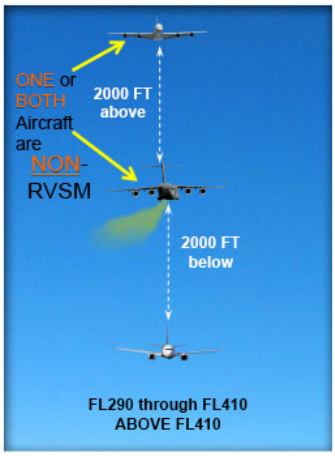
BACK NEXT

Vertical Separation from Fuel Dumping

Fuel dumping aircraft:

- IFR aircraft are vertically separated from fuel dumping aircraft by the following criteria:
  - 1,000 feet above the fuel dumping aircraft (through FL410)
  - Exception: Between FL290 and FL410 – 2,000 feet above the fuel dumping aircraft if either aircraft is non-RVSM
  - 2,000 feet above the fuel dumping aircraft (above FL410)
  - 2,000 feet below the fuel dumping aircraft (regardless of altitude)

JO 7110.65,Chaps. 5 and 9;AIM, Chap. 6



NOTE: In other words, vertical separation above fuel dumping aircraft is standard. Separation below a fuel dumping aircraft is always 2000', regardless of altitude.

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 12

Vertical Separation

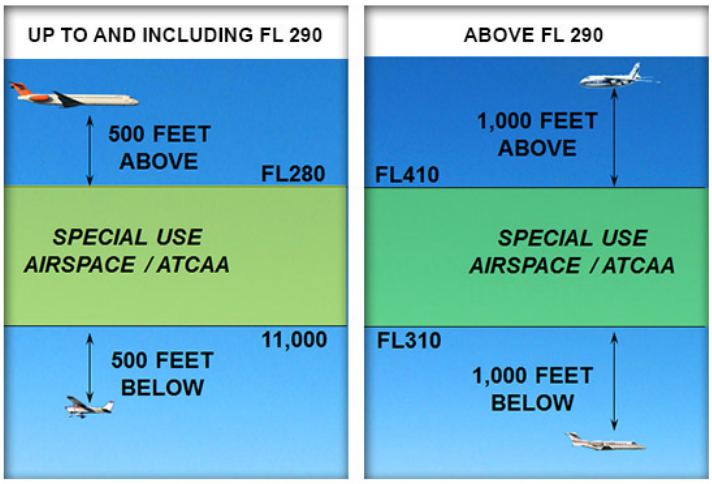
BACK NEXT

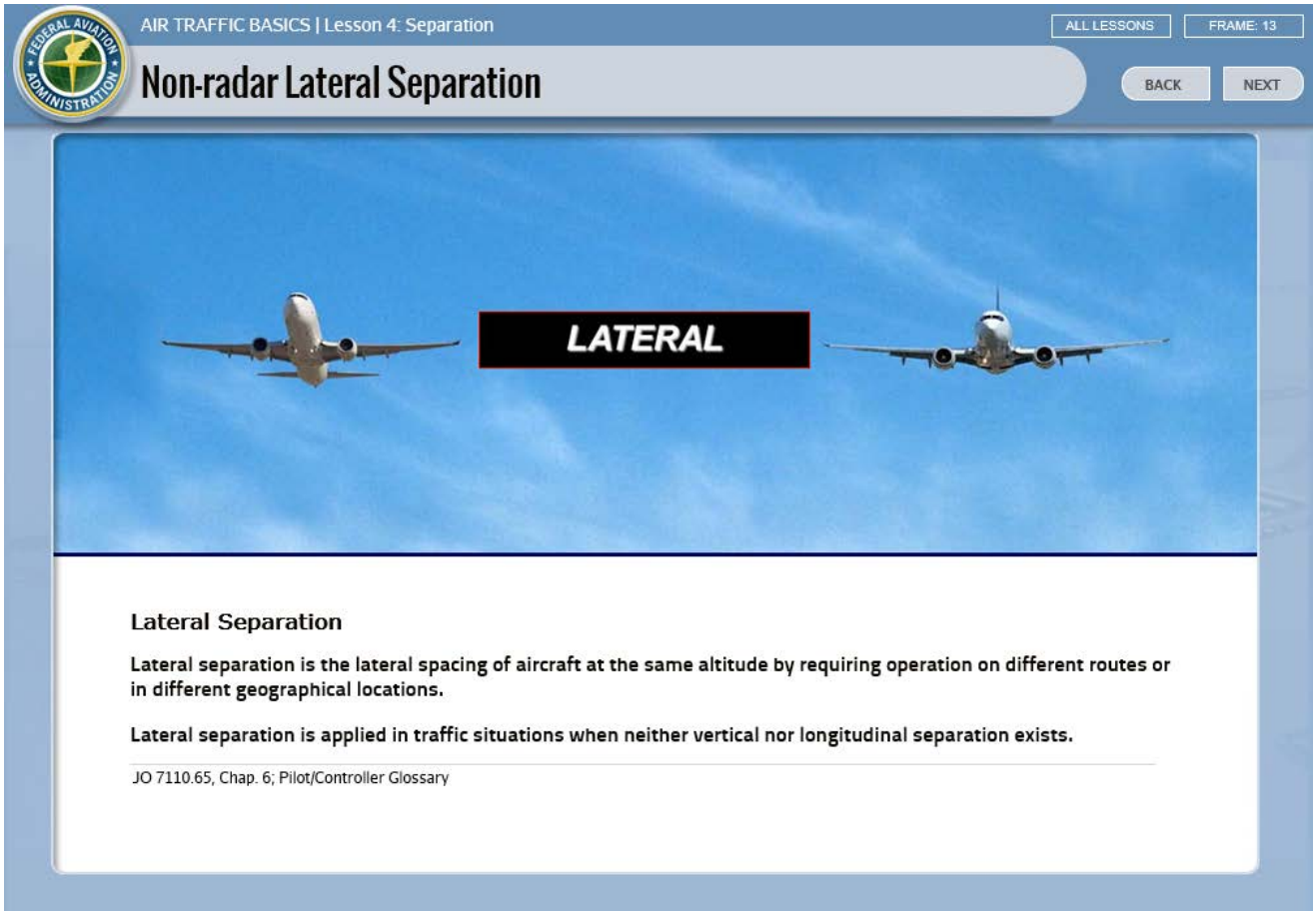
Vertical Separation from Special Use Airspace

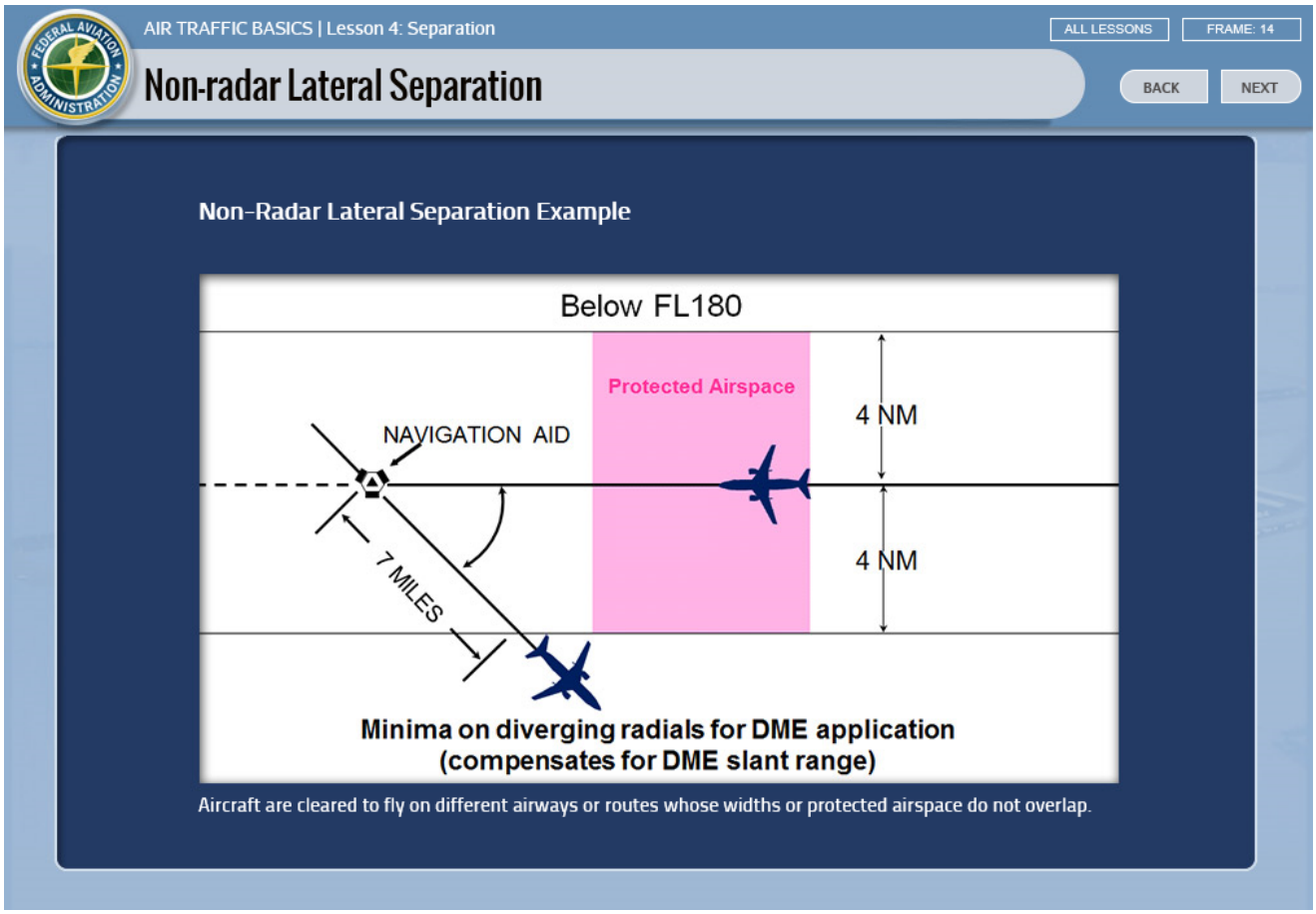
Non-participating aircraft (aircraft not allowed in a particular area) are separated from Special Use Airspace and ATC Assigned Airspace (ATCAA).

- Up to and including FL290
  - By at least 500 feet above/below the upper/lower limit
- Above FL290
  - By at least 1,000 feet above/below the upper/lower limit

JO 7110.65,Chap. 9; AIM Chap. 3;JO 7210.3,Chap. 2




AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 13
Non-radar Lateral Separation
BACK
NEXT
LATERAL
Lateral Separation
Lateral separation is the lateral spacing of aircraft at the same altitude by requiring operation on different routes or in different geographical locations.
Lateral separation is applied in traffic situations when neither vertical nor longitudinal separation exists.
JO 7110.65, Chap. 6; Pilot/Controller Glossary

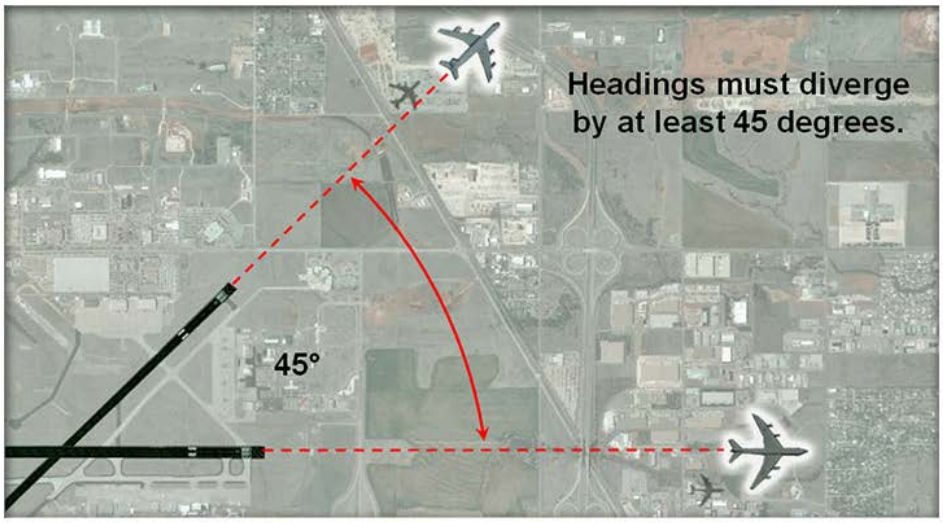

AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 14
Non-radar Lateral Separation
BACK
NEXT
Non-Radar Lateral Separation Example
Below FL180
Protected Airspace
NAVIGATION AID
4 NM
4 NM
7 MILES
Minima on diverging radials for DME application
(compensates for DME slant range)
Aircraft are cleared to fly on different airways or routes whose widths or protected airspace do not overlap.

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 15

Non-radar Lateral Separation

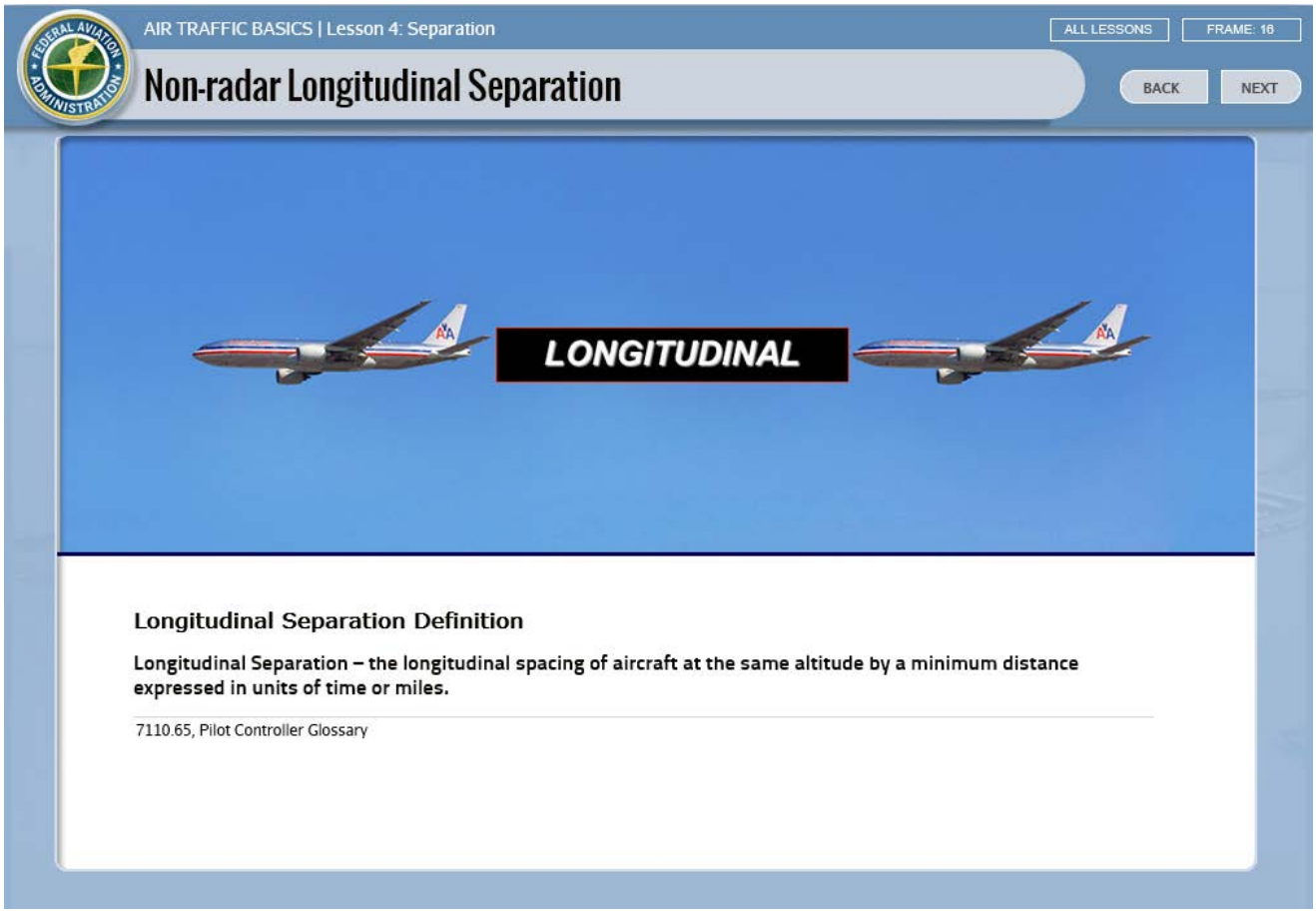
BACK NEXT

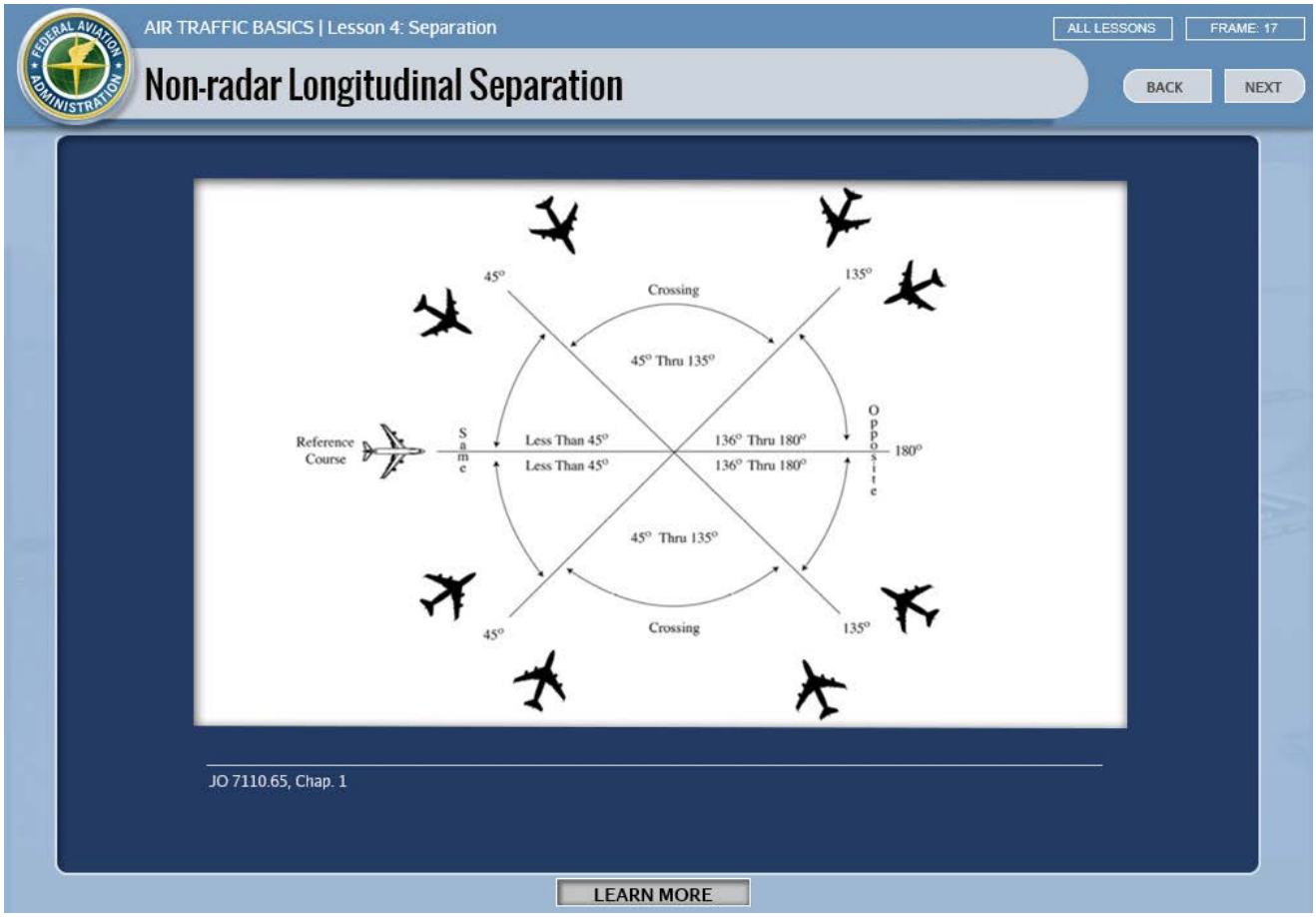


Uses of Lateral Separation by Degree Divergence

Clear departing aircraft to fly specified headings which diverge by at least 45 degrees.

JO 7110.65, Chap. 6


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 16
Non-radar Longitudinal Separation
BACK
NEXT
LONGITUDINAL
Longitudinal Separation Definition
Longitudinal Separation – the longitudinal spacing of aircraft at the same altitude by a minimum distance expressed in units of time or miles.
7110.65, Pilot Controller Glossary



An aircraft on a course within 45 degrees of another aircraft is considered to be on the same course.

An aircraft on a course between 45 degrees and 135 degrees is considered to be crossing through the course of another aircraft.

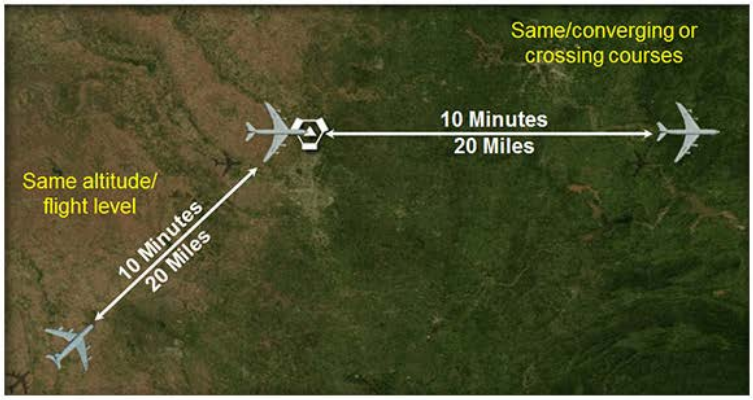
An aircraft more that 135 degrees from another aircraft is considered to be on an opposite course.

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 18

Non-Radar Longitudinal Separation

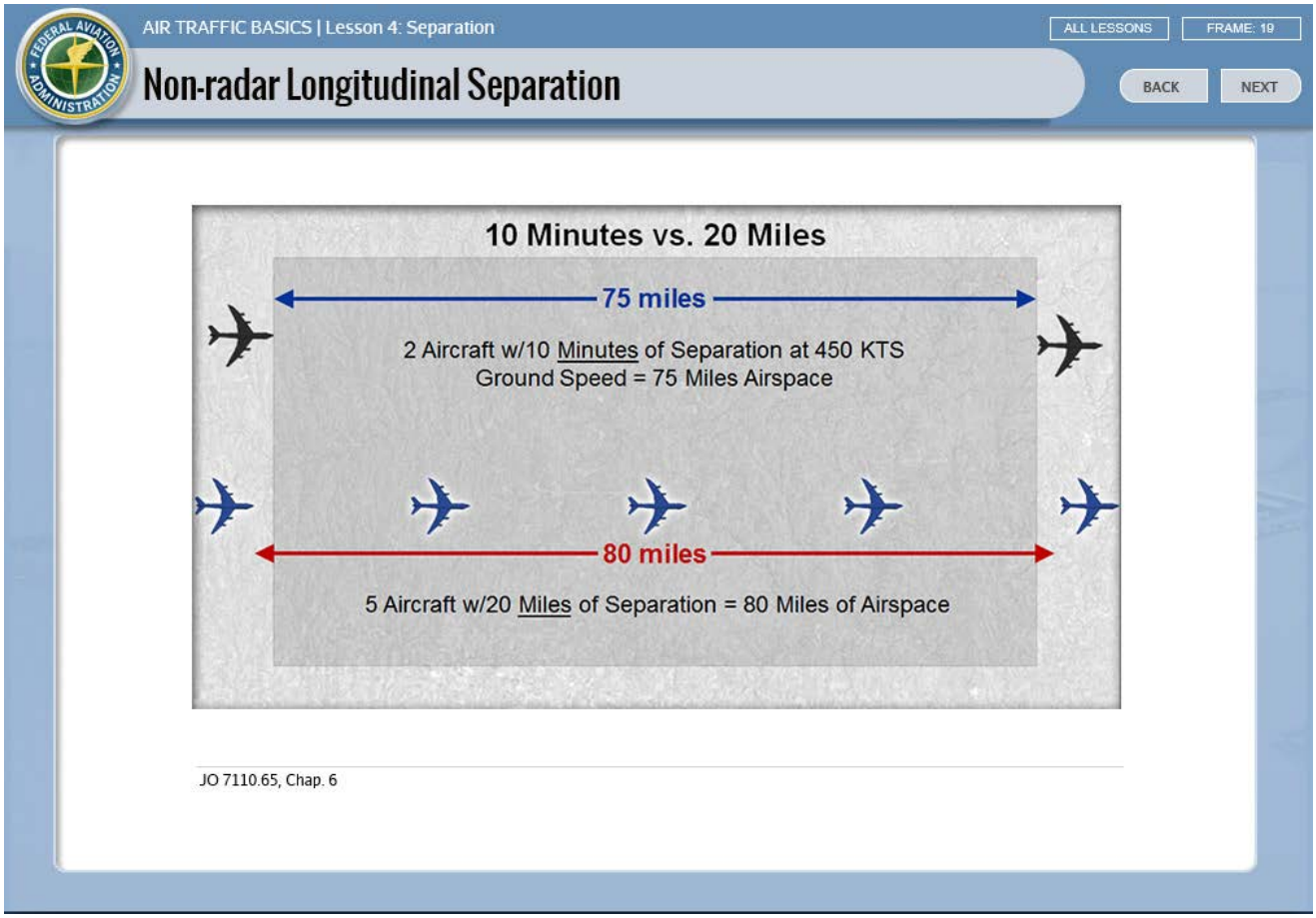
BACK NEXT

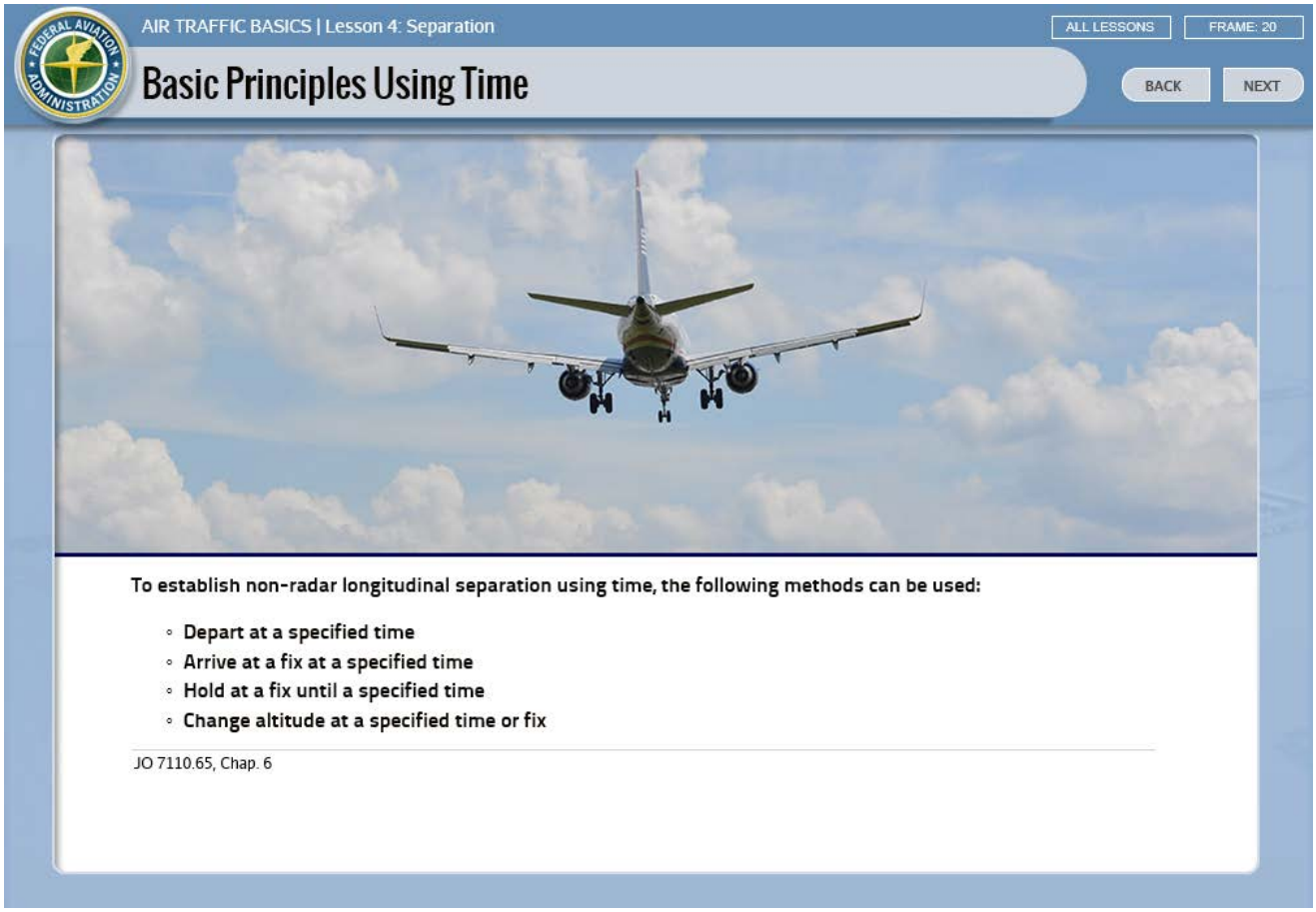


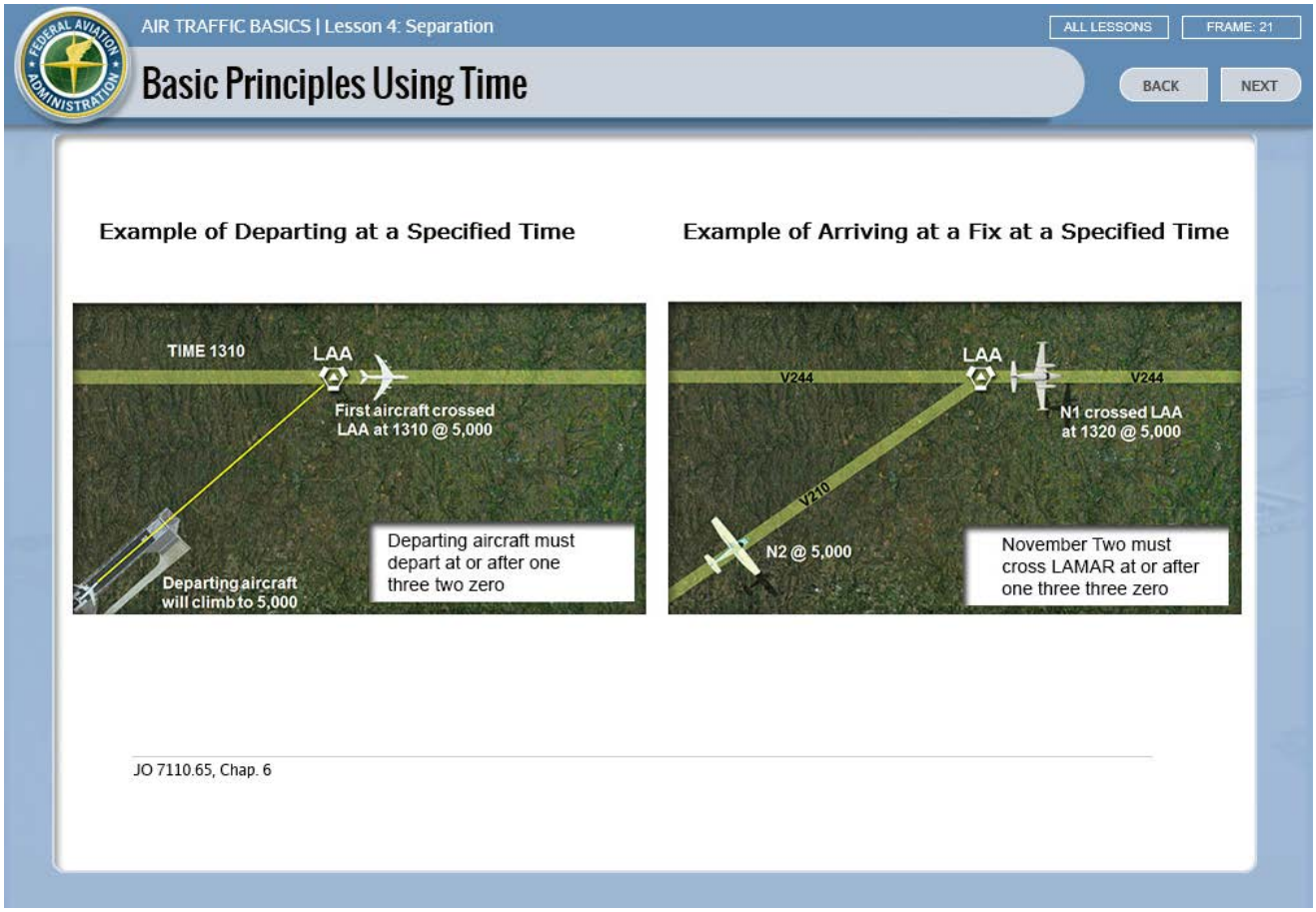
The standard minima for non-radar longitudinal separation is:

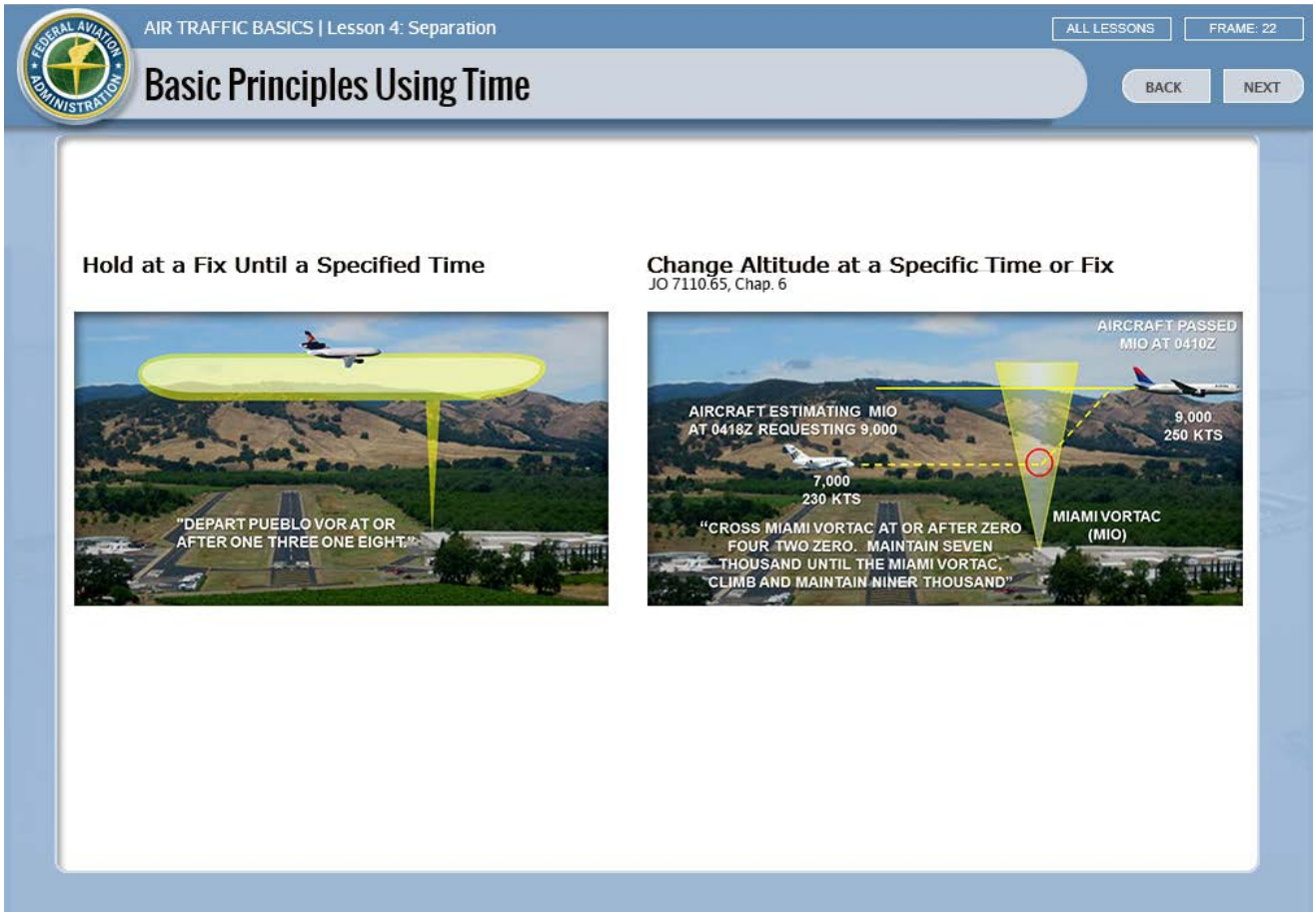
- 10 minutes or 20 miles
  - Depending on speed, 10 minutes is usually more than 20 miles.
- Example: Using 450 knots ground speed, separation between two aircraft 10 minutes in trail is approximately 75 miles.

JO 7110.65, Chap. 6


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 19
Non-radar Longitudinal Separation
BACK
NEXT
10 Minutes vs. 20 Miles
75 miles
2 Aircraft w/10 Minutes of Separation at 450 KTS
Ground Speed = 75 Miles Airspace
80 miles
5 Aircraft w/20 Miles of Separation = 80 Miles of Airspace
JO 7110.65, Chap. 6


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 20
Basic Principles Using Time
BACK
NEXT
To establish non-radar longitudinal separation using time, the following methods can be used:
◦ Depart at a specified time
◦ Arrive at a fix at a specified time
◦ Hold at a fix until a specified time
◦ Change altitude at a specified time or fix
JO 7110.65, Chap. 6


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 21
Basic Principles Using Time
BACK
NEXT
Example of Departing at a Specified Time
TIME 1310
LAA
First aircraft crossed LAA at 1310 @ 5,000
Departing aircraft must depart at or after one three two zero
Departing aircraft will climb to 5,000
Example of Arriving at a Fix at a Specified Time
LAA
V244
V244
N1 crossed LAA at 1320 @ 5,000
V210
N2 @ 5,000
November Two must cross LAMAR at or after one three three zero
JO 7110.65, Chap. 6

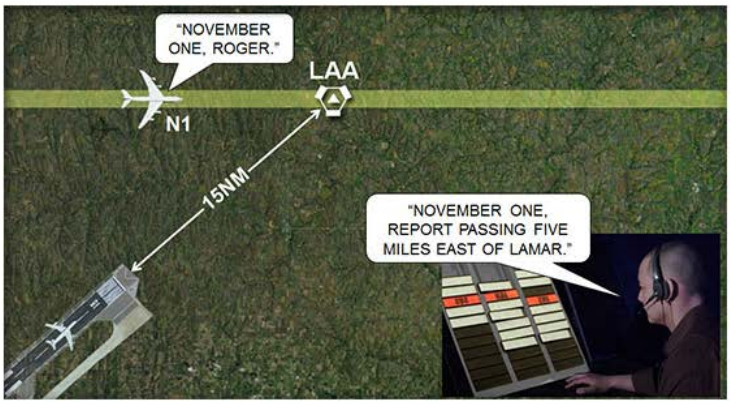

AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 22
Basic Principles Using Time
BACK
NEXT
Hold at a Fix Until a Specified Time
"DEPART PUEBLO VOR AT OR AFTER ONE THREE ONE EIGHT."
Change Altitude at a Specific Time or Fix
JO 7110.65, Chap. 6
AIRCRAFT PASSED MIO AT 0410Z
AIRCRAFT ESTIMATING MIO AT 0418Z REQUESTING 9,000
9,000
250 KTS
7,000
230 KTS
"CROSS MIAMI VORTAC AT OR AFTER ZERO FOUR TWO ZERO. MAINTAIN SEVEN THOUSAND UNTIL THE MIAMI VORTAC, CLIMB AND MAINTAIN NINER THOUSAND"
MIAMI VORTAC (MIO)

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 23

Basic Principles Using DME

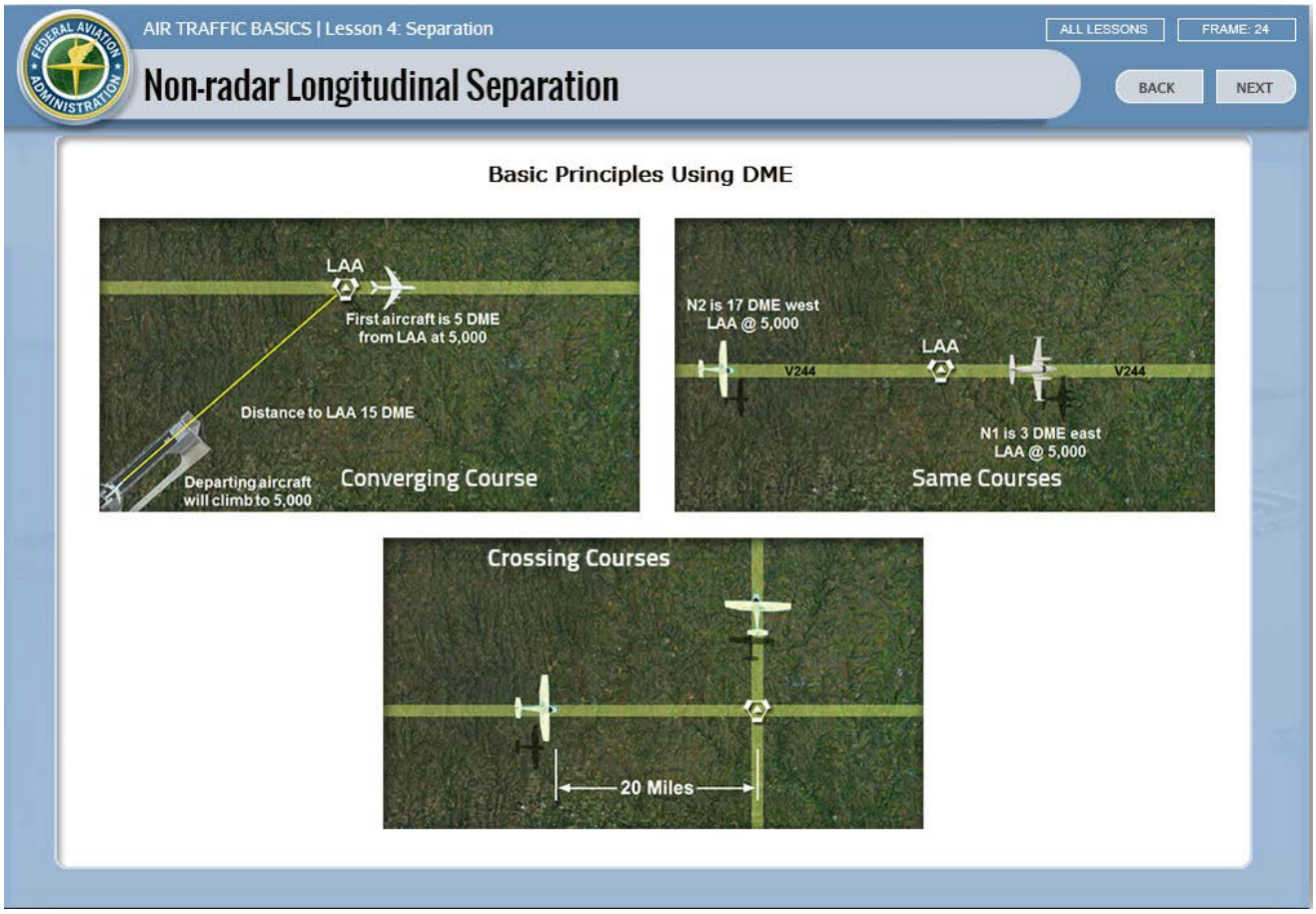
BACK NEXT

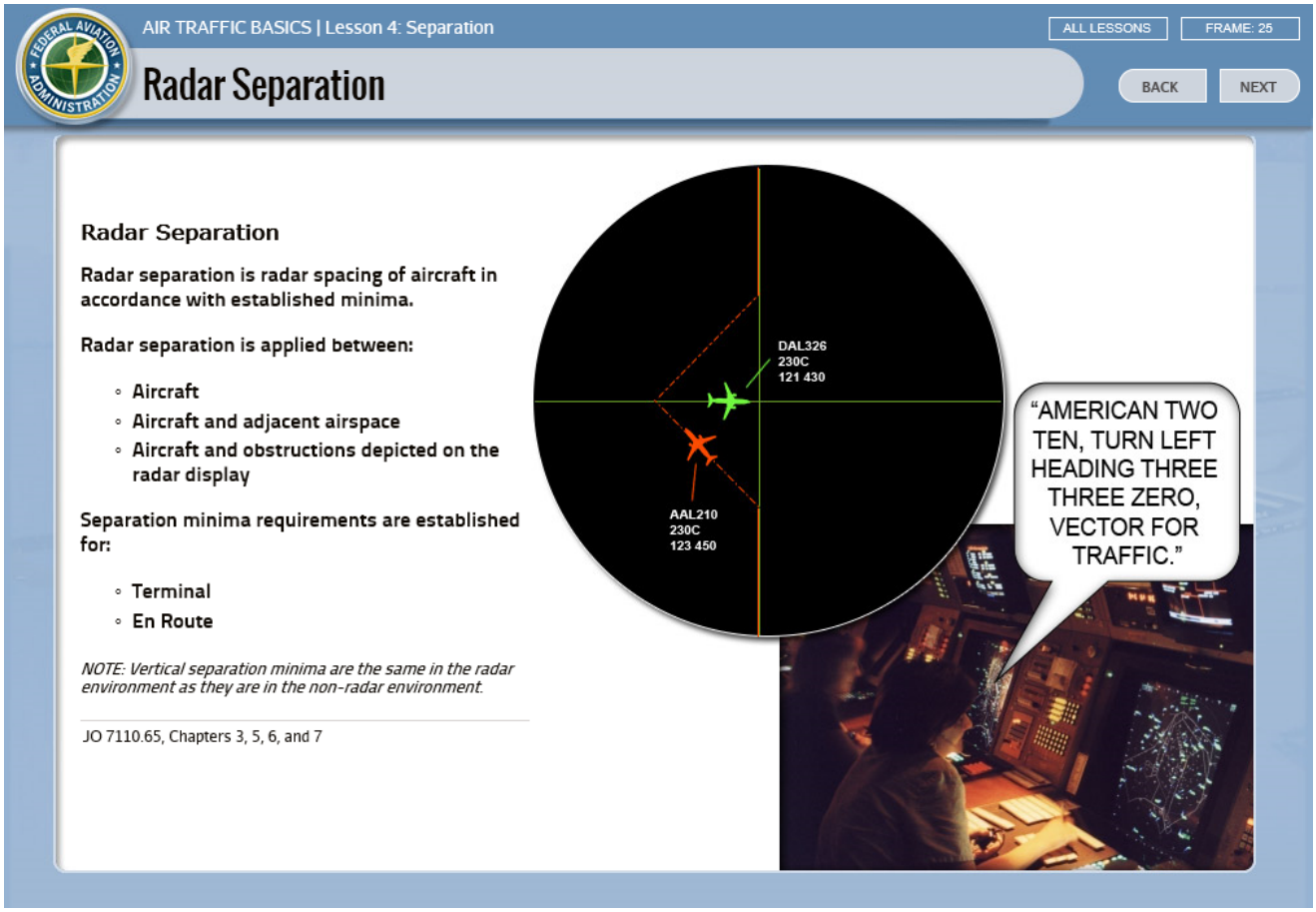


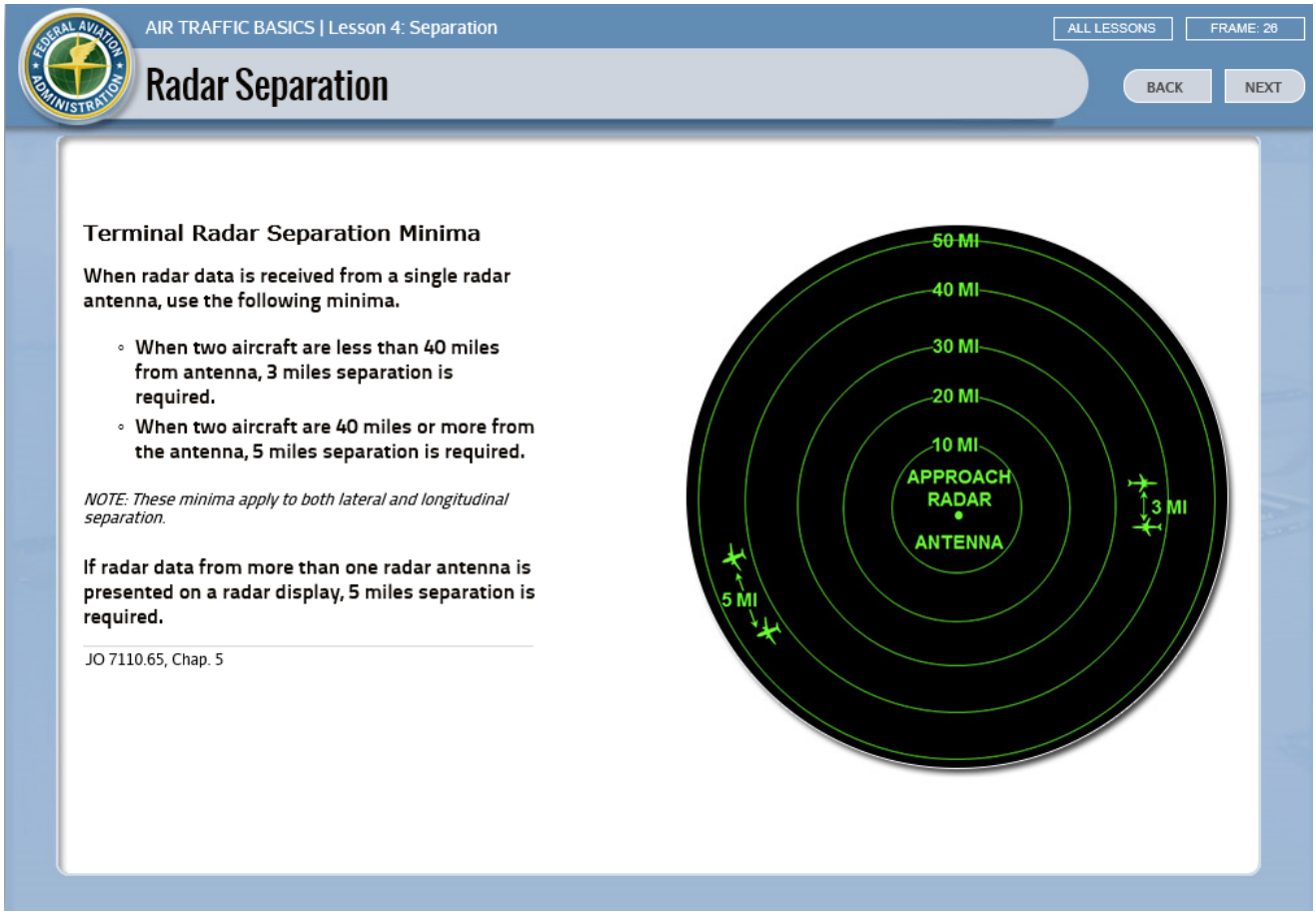
Establishing non-radar longitudinal separation using Distance Measuring Equipment (DME) requires pilot position reports.

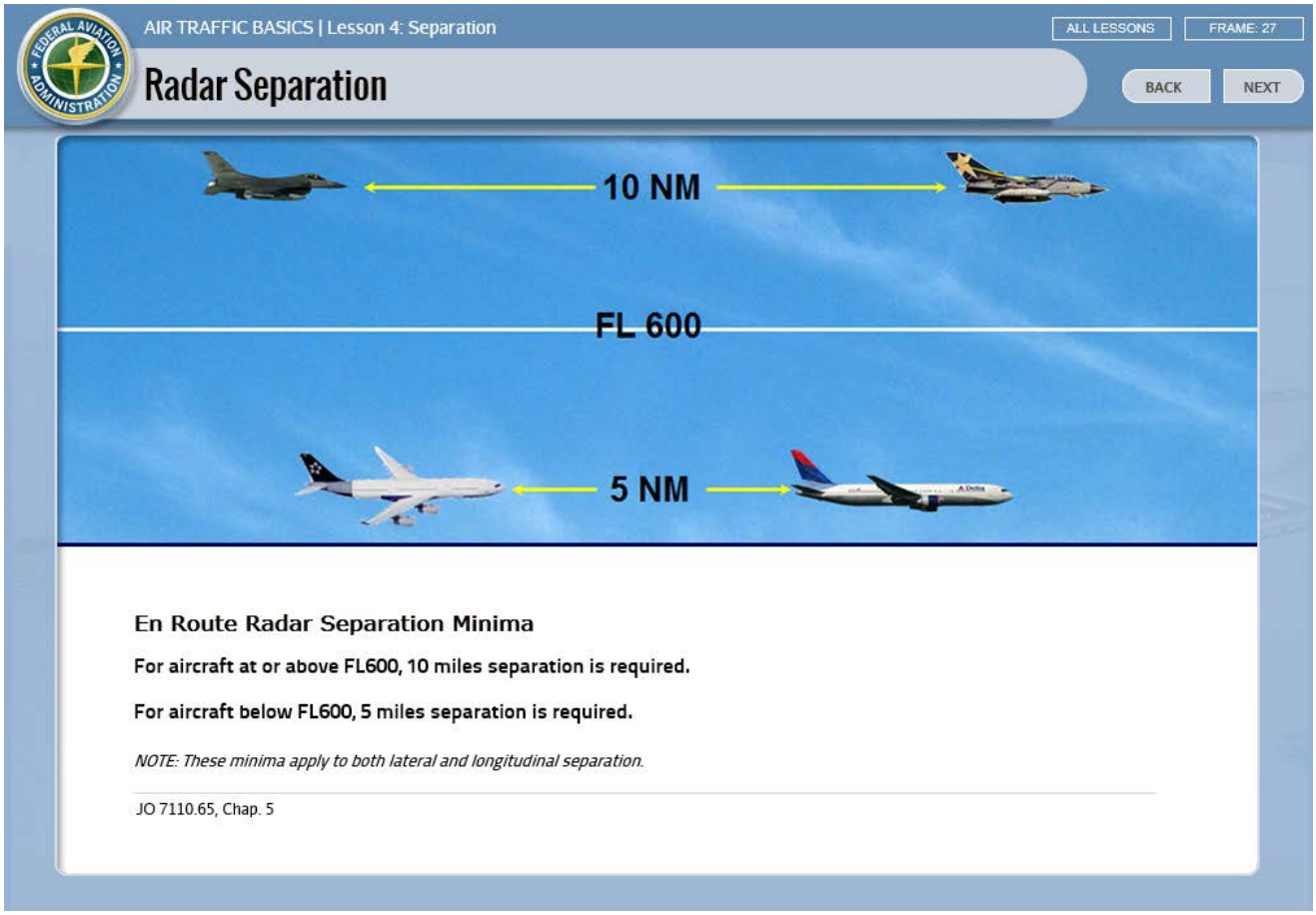
- **Always get the report of the lead aircraft first.**

JO 7110.65, Chap. 6


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 24
Non-radar Longitudinal Separation
BACK
NEXT
Basic Principles Using DME
LAA
First aircraft is 5 DME from LAA at 5,000
Distance to LAA 15 DME
Departing aircraft will climb to 5,000
Converging Course
N2 is 17 DME west LAA @ 5,000
LAA
V244
V244
N1 is 3 DME east LAA @ 5,000
Same Courses
Crossing Courses
20 Miles


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 25
Radar Separation
BACK
NEXT
Radar Separation
Radar separation is radar spacing of aircraft in accordance with established minima.
Radar separation is applied between:
◦ Aircraft
◦ Aircraft and adjacent airspace
◦ Aircraft and obstructions depicted on the radar display
Separation minima requirements are established for:
◦ Terminal
◦ En Route
NOTE: Vertical separation minima are the same in the radar environment as they are in the non-radar environment.
JO 7110.65, Chapters 3, 5, 6, and 7
DAL326
230C
121 430
AAL210
230C
123 450
"AMERICAN TWO TEN, TURN LEFT HEADING THREE THREE ZERO, VECTOR FOR TRAFFIC."


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 26
Radar Separation
BACK
NEXT
Terminal Radar Separation Minima
When radar data is received from a single radar antenna, use the following minima.
◦ When two aircraft are less than 40 miles from antenna, 3 miles separation is required.
◦ When two aircraft are 40 miles or more from the antenna, 5 miles separation is required.
NOTE: These minima apply to both lateral and longitudinal separation.
If radar data from more than one radar antenna is presented on a radar display, 5 miles separation is required.
JO 7110.65, Chap. 5
50 MI
40 MI
30 MI
20 MI
10 MI
APPROACH RADAR ANTENNA
3 MI
5 MI

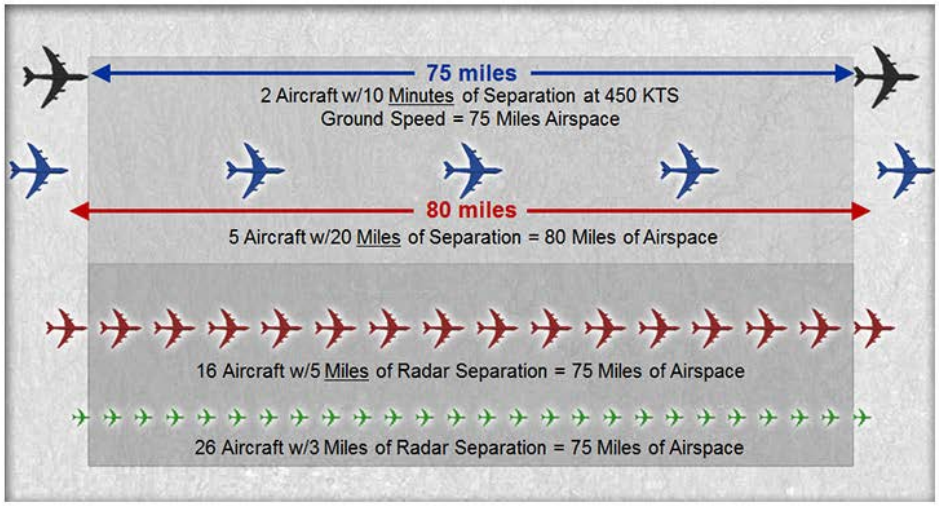

AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 27
Radar Separation
BACK
NEXT
10 NM
FL 600
5 NM
En Route Radar Separation Minima
For aircraft at or above FL600, 10 miles separation is required.
For aircraft below FL600, 5 miles separation is required.
NOTE: These minima apply to both lateral and longitudinal separation.
JO 7110.65, Chap. 5

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 28

Radar VS. Non-Radar Separation

BACK NEXT



Radar operations gain a significant advantage over non-radar operations.

JO 7110.65, Chap. 5

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 29

Visual Separation

BACK NEXT

Visual Separation

Visual Separation is a means employed by ATC to separate aircraft in the NAS.

- In this type of separation, there are no time or distance minima, per se, but separation is accomplished by visually avoiding other aircraft.

This separation requires visual contact of aircraft by either the Tower Controller or the pilot of an aircraft.

Three types of visual separation are explained in this lesson:

- Tower Visual Separation
- Radar Visual Separation
- Visual Separation used in conjunction with visual approaches

JO 7110.65, Chap. 3

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 30

Visual Separation

BACK NEXT

Visual Separation - Tower

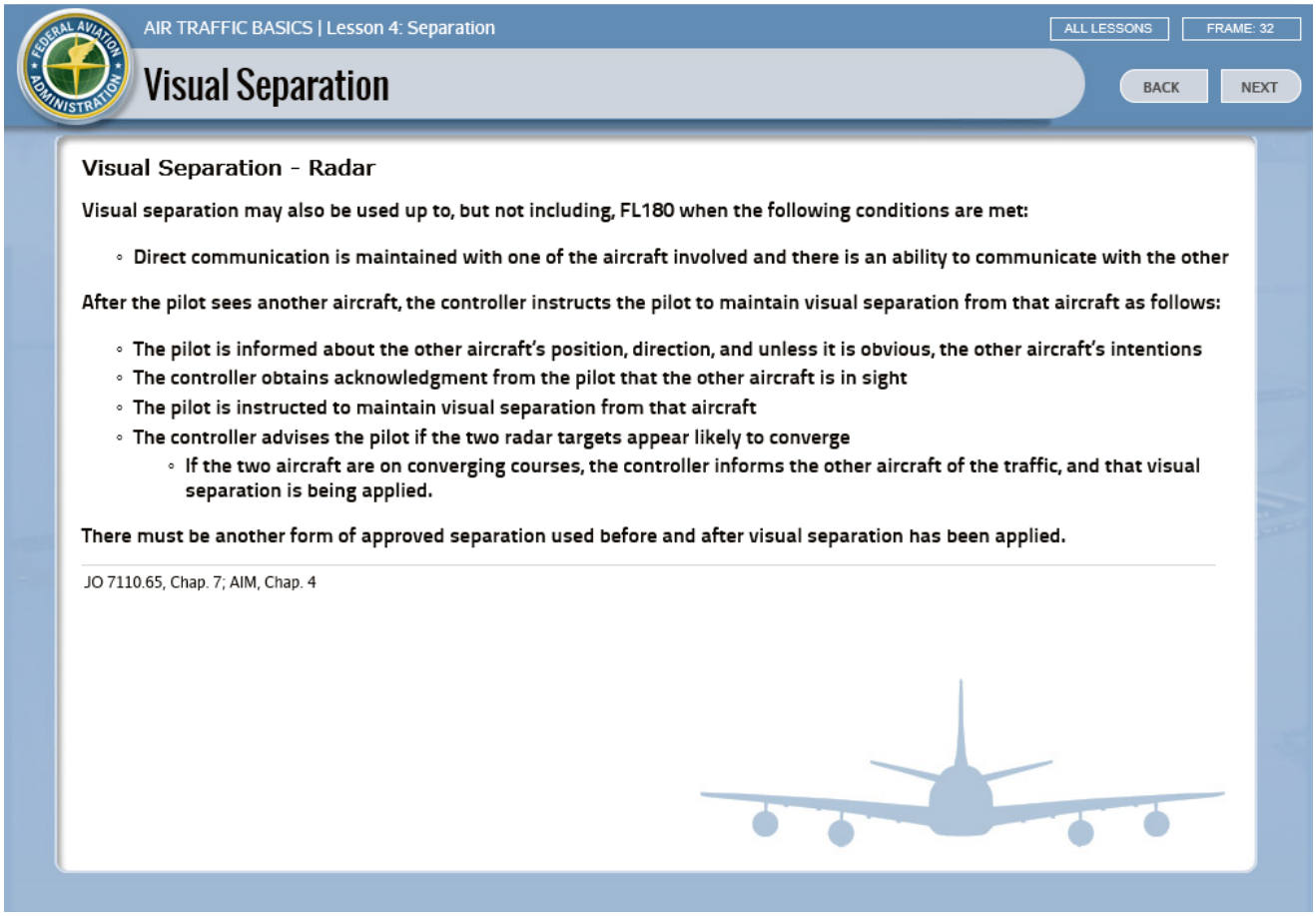
A tower controller may use visual separation provided both aircraft are in sight and instructions can be issued to keep them apart.

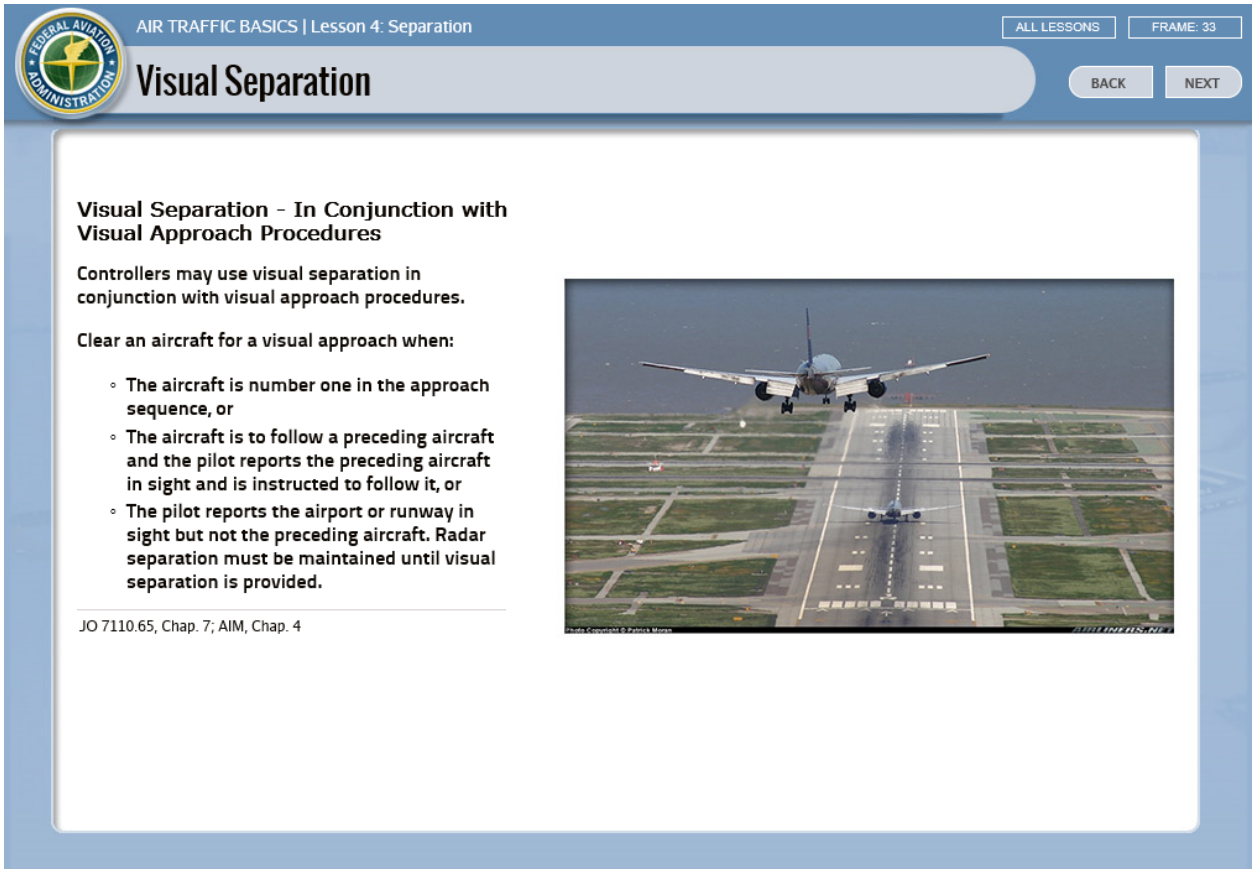
- **There must be another form of separation used before and after visual separation has been applied.**

Communication must be maintained with at least one of the aircraft involved or the capability to communicate immediately must be available.

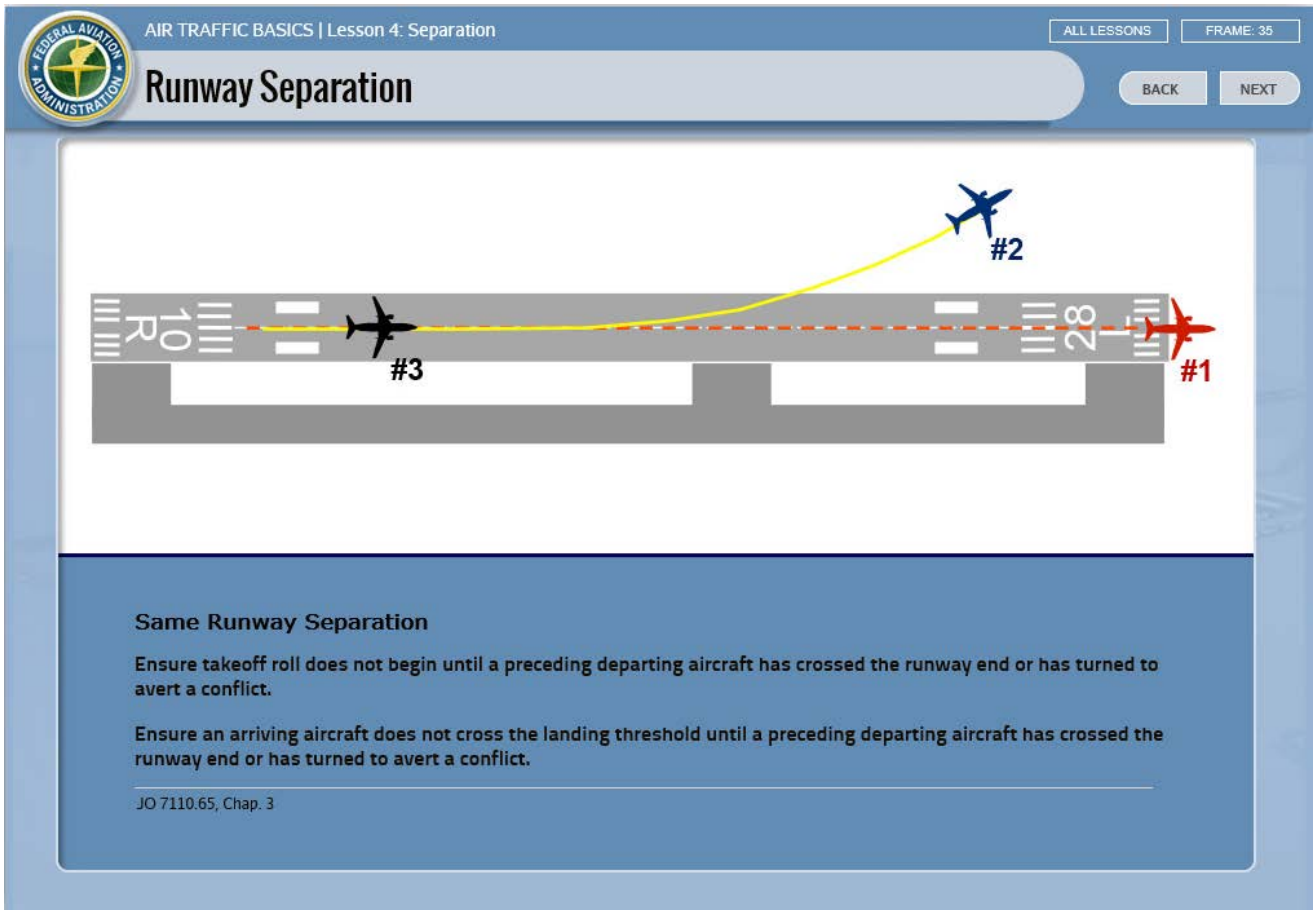
JO 7110.65, Chapters 3 and 7

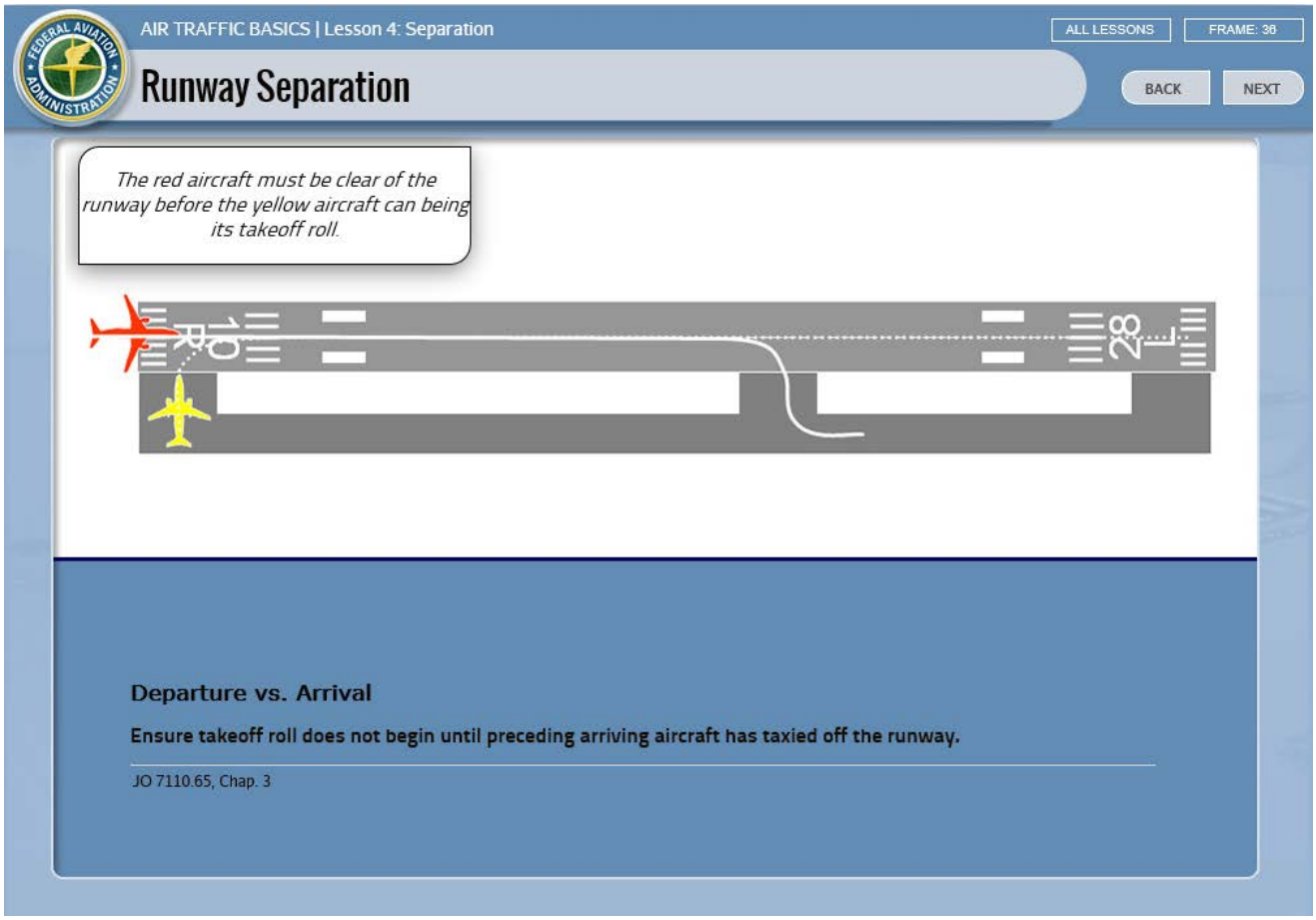

AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 31
Separation Review
BACK
NEXT
Separation is the spacing of aircraft to ensure the safe and orderly movement of aircraft, while in flight or on the ground.
Separation occurs in both radar and non-radar environments.
Different separation minima are applied depending on the environment (radar/non-radar).
In both radar and non-radar environments, aircraft can be separated:
◦ Vertically
◦ Laterally
◦ Longitudinally
Note:: In the next sections we will discuss two other types of separation: visual and runway.

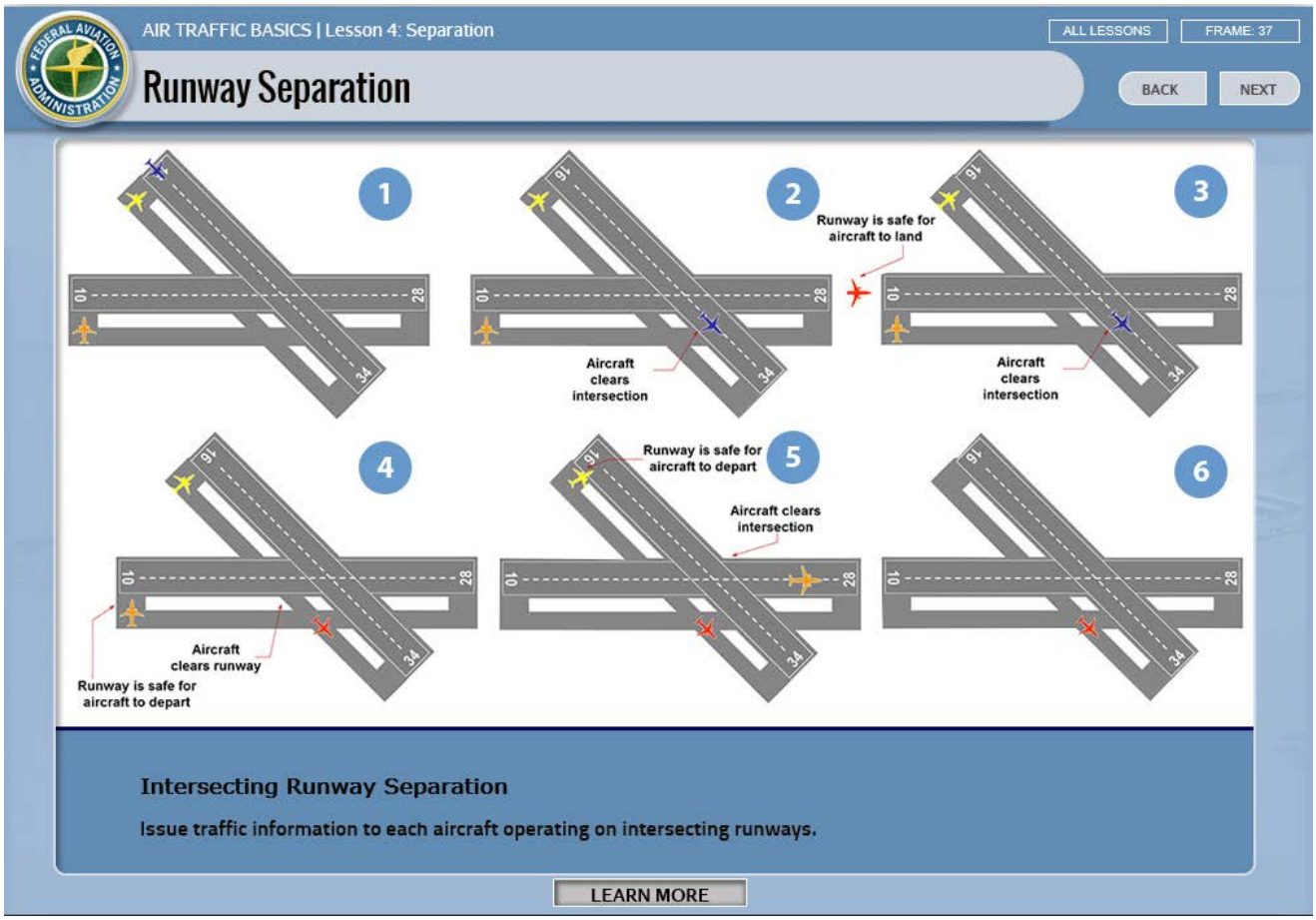

AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 32
Visual Separation
BACK
NEXT
Visual Separation - Radar
Visual separation may also be used up to, but not including, FL180 when the following conditions are met:
◦ Direct communication is maintained with one of the aircraft involved and there is an ability to communicate with the other
After the pilot sees another aircraft, the controller instructs the pilot to maintain visual separation from that aircraft as follows:
◦ The pilot is informed about the other aircraft's position, direction, and unless it is obvious, the other aircraft's intentions
◦ The controller obtains acknowledgment from the pilot that the other aircraft is in sight
◦ The pilot is instructed to maintain visual separation from that aircraft
◦ The controller advises the pilot if the two radar targets appear likely to converge
◦ If the two aircraft are on converging courses, the controller informs the other aircraft of the traffic, and that visual separation is being applied.
There must be another form of approved separation used before and after visual separation has been applied.
JO 7110.65, Chap. 7; AIM, Chap. 4


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 33
Visual Separation
BACK
NEXT
Visual Separation - In Conjunction with Visual Approach Procedures
Controllers may use visual separation in conjunction with visual approach procedures.
Clear an aircraft for a visual approach when:
◦ The aircraft is number one in the approach sequence, or
◦ The aircraft is to follow a preceding aircraft and the pilot reports the preceding aircraft in sight and is instructed to follow it, or
◦ The pilot reports the airport or runway in sight but not the preceding aircraft. Radar separation must be maintained until visual separation is provided.
JO 7110.65, Chap. 7; AIM, Chap. 4


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 34
Runway Separation
BACK
NEXT
Runway Separation
Runway separation is applied by Tower Controllers only.
Generally, only one aircraft at a time is authorized to use a specific runway.
JO 7110.65, Chap. 3


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 35
Runway Separation
BACK
NEXT
#2
10R
28L
#3
#1
Same Runway Separation
Ensure takeoff roll does not begin until a preceding departing aircraft has crossed the runway end or has turned to avert a conflict.
Ensure an arriving aircraft does not cross the landing threshold until a preceding departing aircraft has crossed the runway end or has turned to avert a conflict.
JO 7110.65, Chap. 3

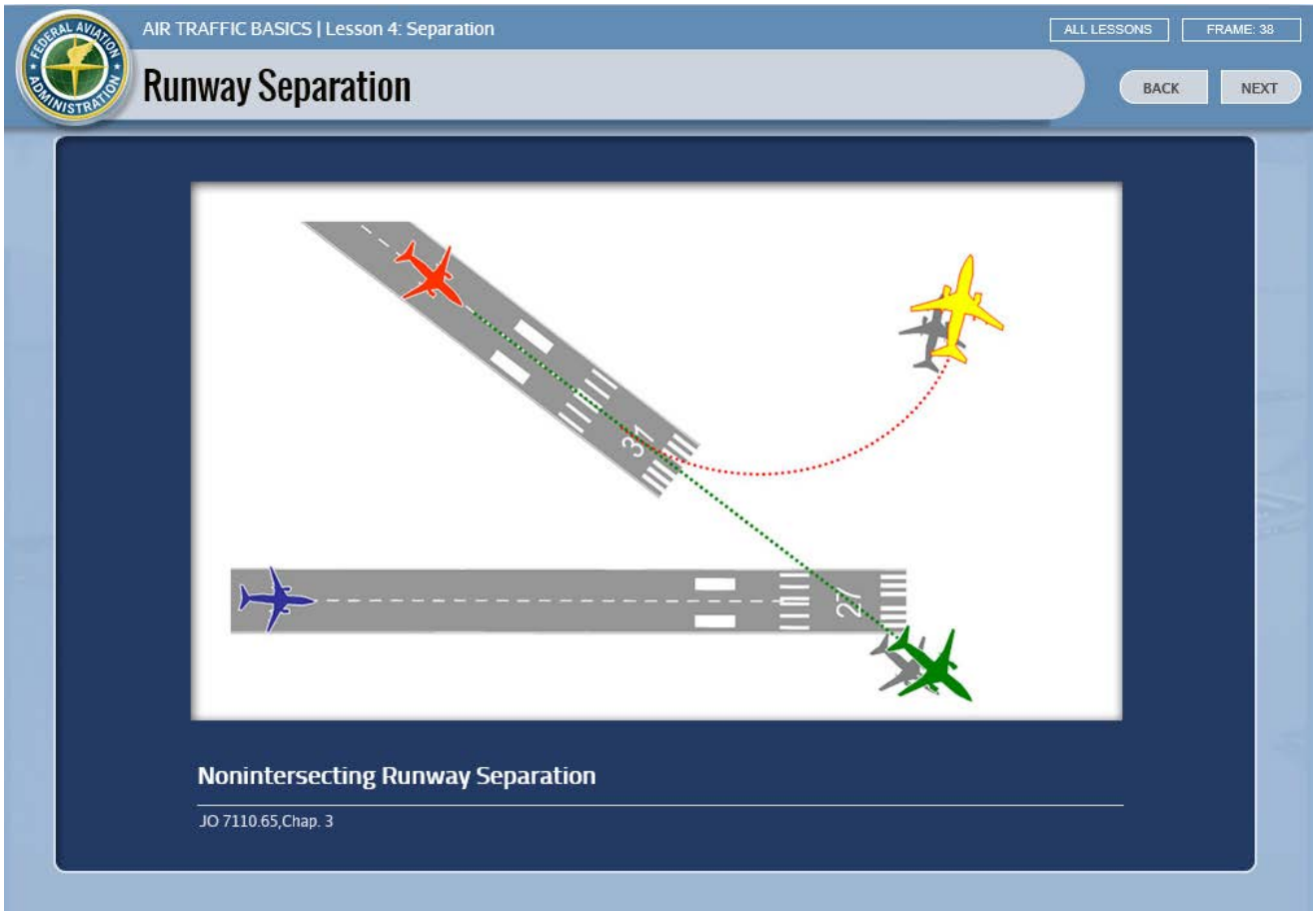

AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 36
Runway Separation
BACK
NEXT
The red aircraft must be clear of the runway before the yellow aircraft can being its takeoff roll.
Departure vs. Arrival
Ensure takeoff roll does not begin until preceding arriving aircraft has taxied off the runway.
JO 7110.65, Chap. 3

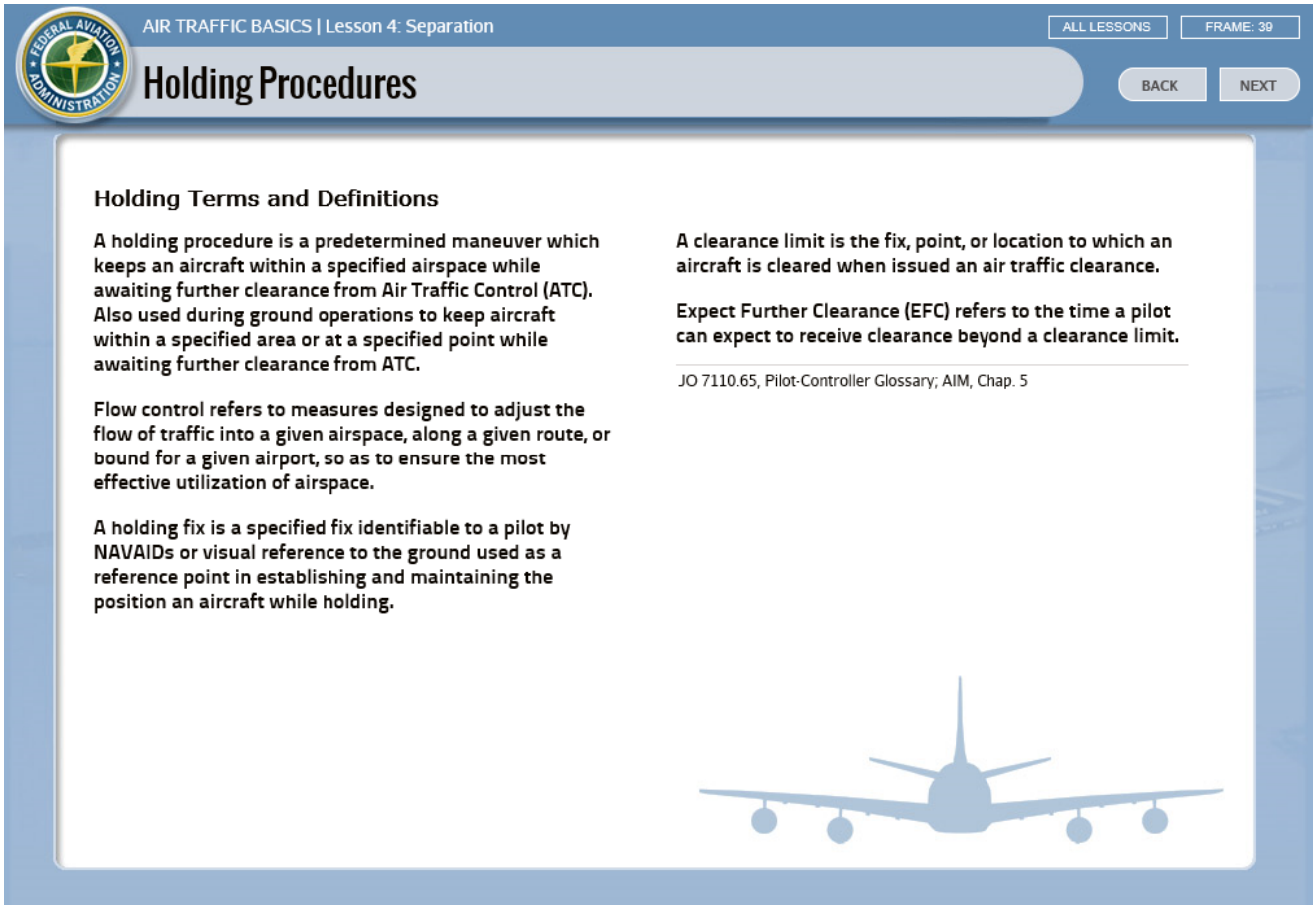


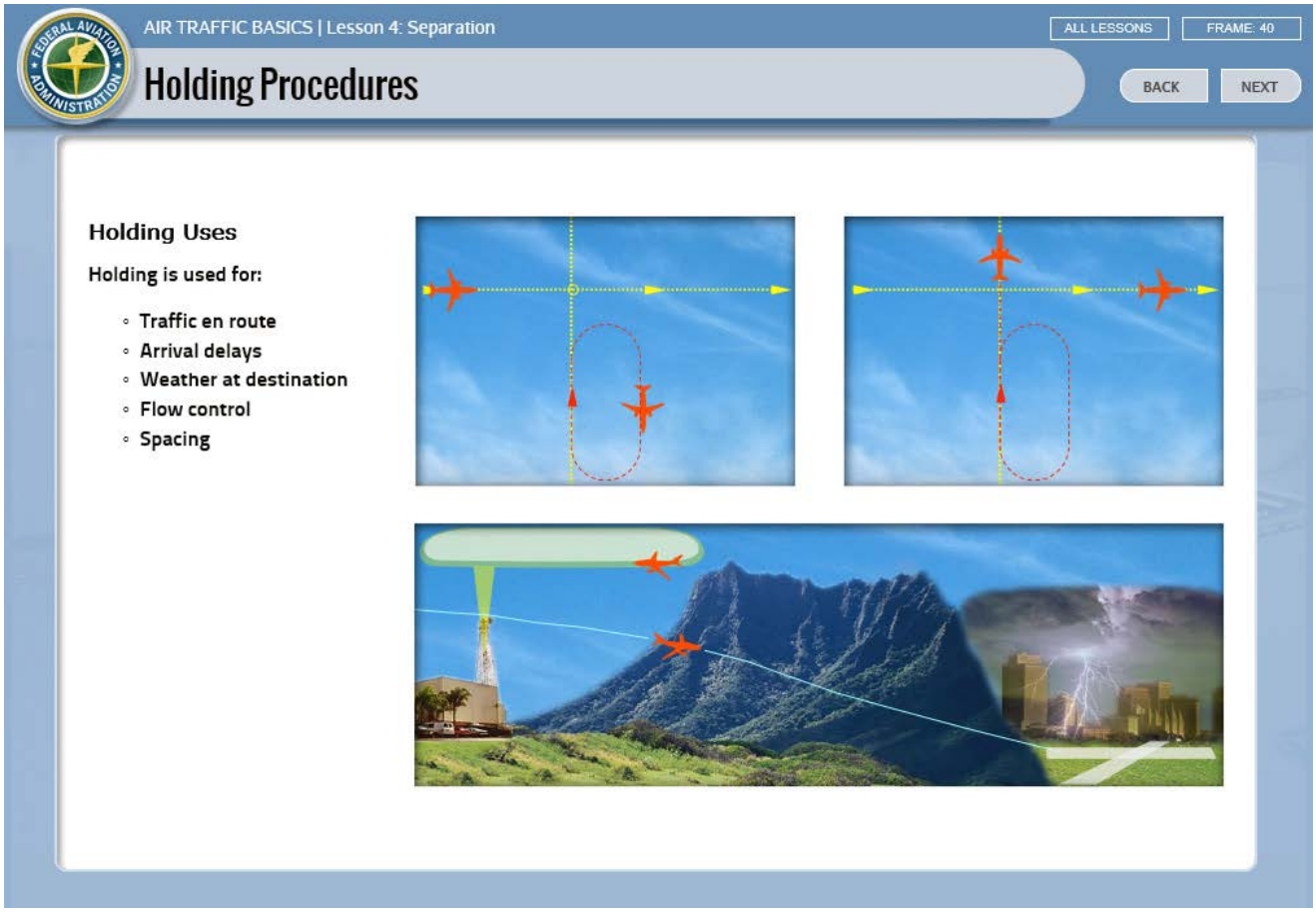
Separate departing aircraft from an aircraft using an intersecting runway, or nonintersecting runway, when the flight paths intersect by ensuring that the departure does not begin takeoff roll until one of the following exists:

- Preceding aircraft has departed and passed the intersection, (has crossed the departure runway) or is turning to avert any conflict
- Preceding arriving aircraft is clear of the landing runway, completed the landing roll and will hold short of the intersection, passed the intersection, or has crossed over the departure runway

Reference: JO 7110.65,Chap. 3


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 38
Runway Separation
BACK
NEXT
Nonintersecting Runway Separation
JO 7110.65,Chap. 3


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 39
Holding Procedures
BACK
NEXT
Holding Terms and Definitions
A holding procedure is a predetermined maneuver which keeps an aircraft within a specified airspace while awaiting further clearance from Air Traffic Control (ATC). Also used during ground operations to keep aircraft within a specified area or at a specified point while awaiting further clearance from ATC.
Flow control refers to measures designed to adjust the flow of traffic into a given airspace, along a given route, or bound for a given airport, so as to ensure the most effective utilization of airspace.
A holding fix is a specified fix identifiable to a pilot by NAVAIDs or visual reference to the ground used as a reference point in establishing and maintaining the position an aircraft while holding.
A clearance limit is the fix, point, or location to which an aircraft is cleared when issued an air traffic clearance.
Expect Further Clearance (EFC) refers to the time a pilot can expect to receive clearance beyond a clearance limit.
JO 7110.65, Pilot-Controller Glossary; AIM, Chap. 5


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 40
Holding Procedures
BACK
NEXT
Holding Uses
Holding is used for:
◦ Traffic en route
◦ Arrival delays
◦ Weather at destination
◦ Flow control
◦ Spacing

AIR TRAFFIC BASICS | Lesson 4: Separation

ALL LESSONS FRAME: 41

Holding Procedures

BACK NEXT

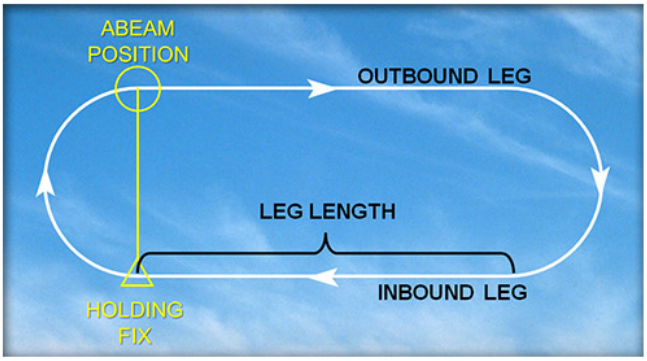
Typical Holding Pattern

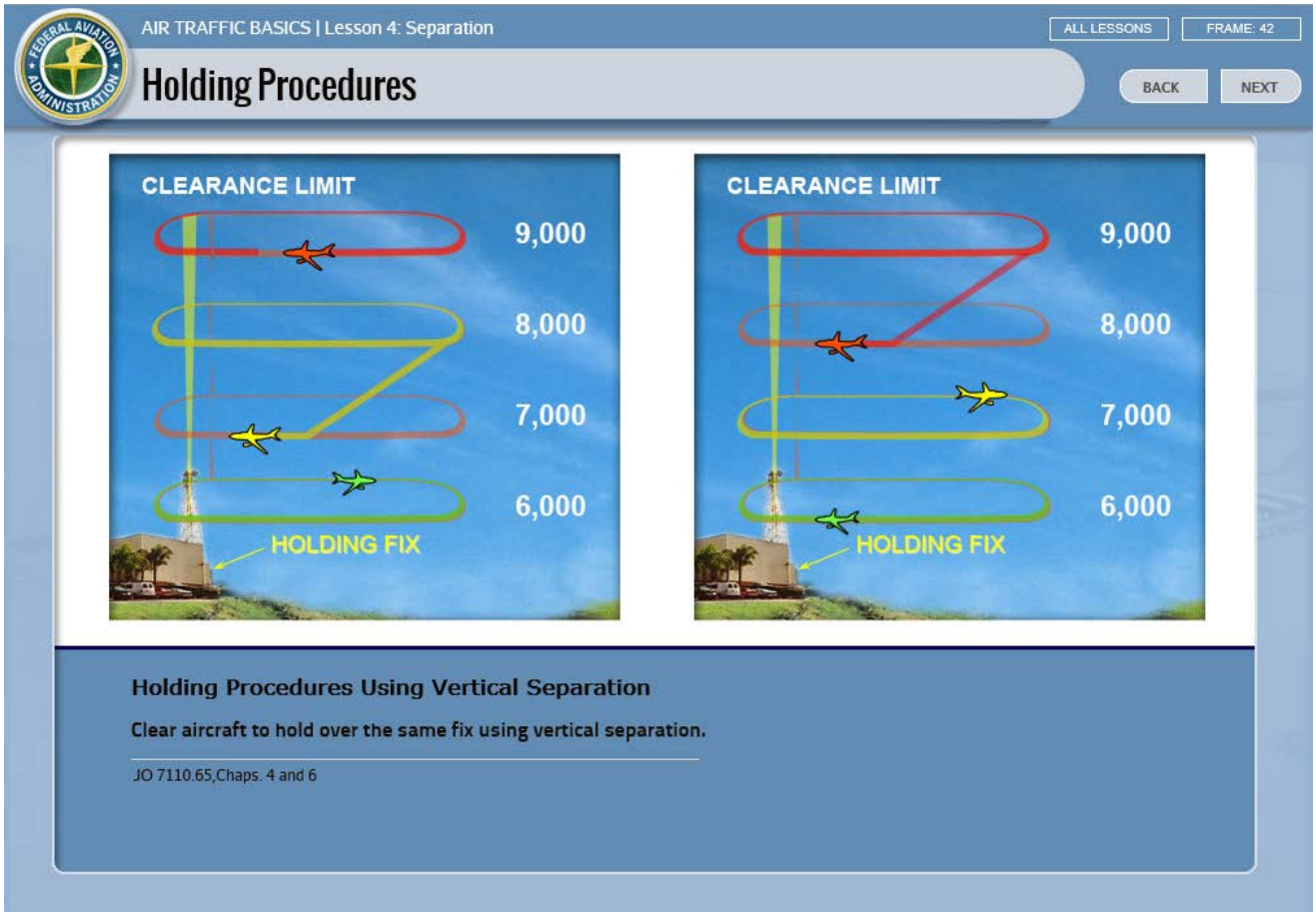
Holding Fix (see definition)

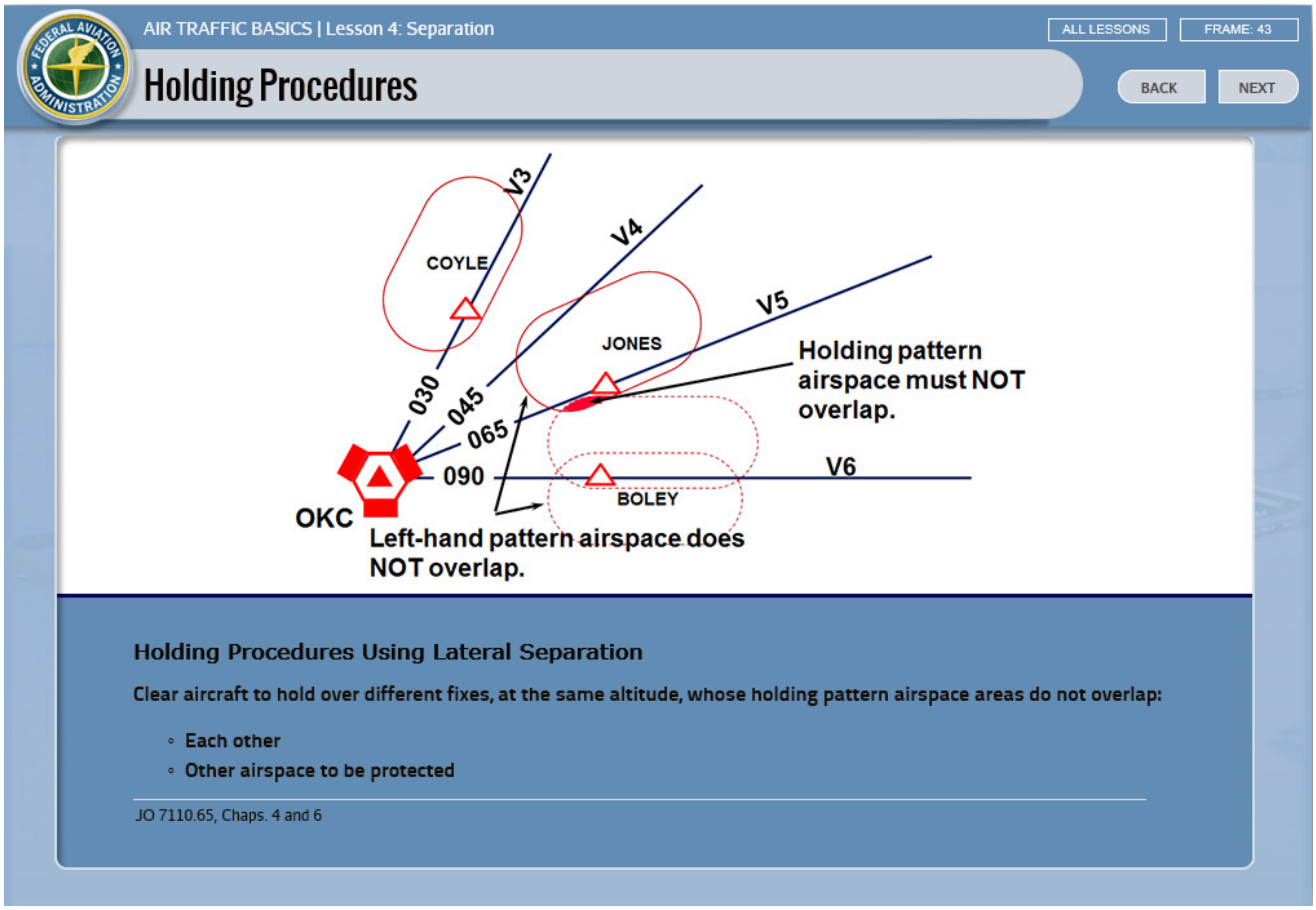
- Standard pattern
  - Right turns
  - One minute legs (1 ½ minute above 14,000 MSL)
- Nonstandard Pattern
  - Left Turns
  - Other than standard timing, or DME leg length

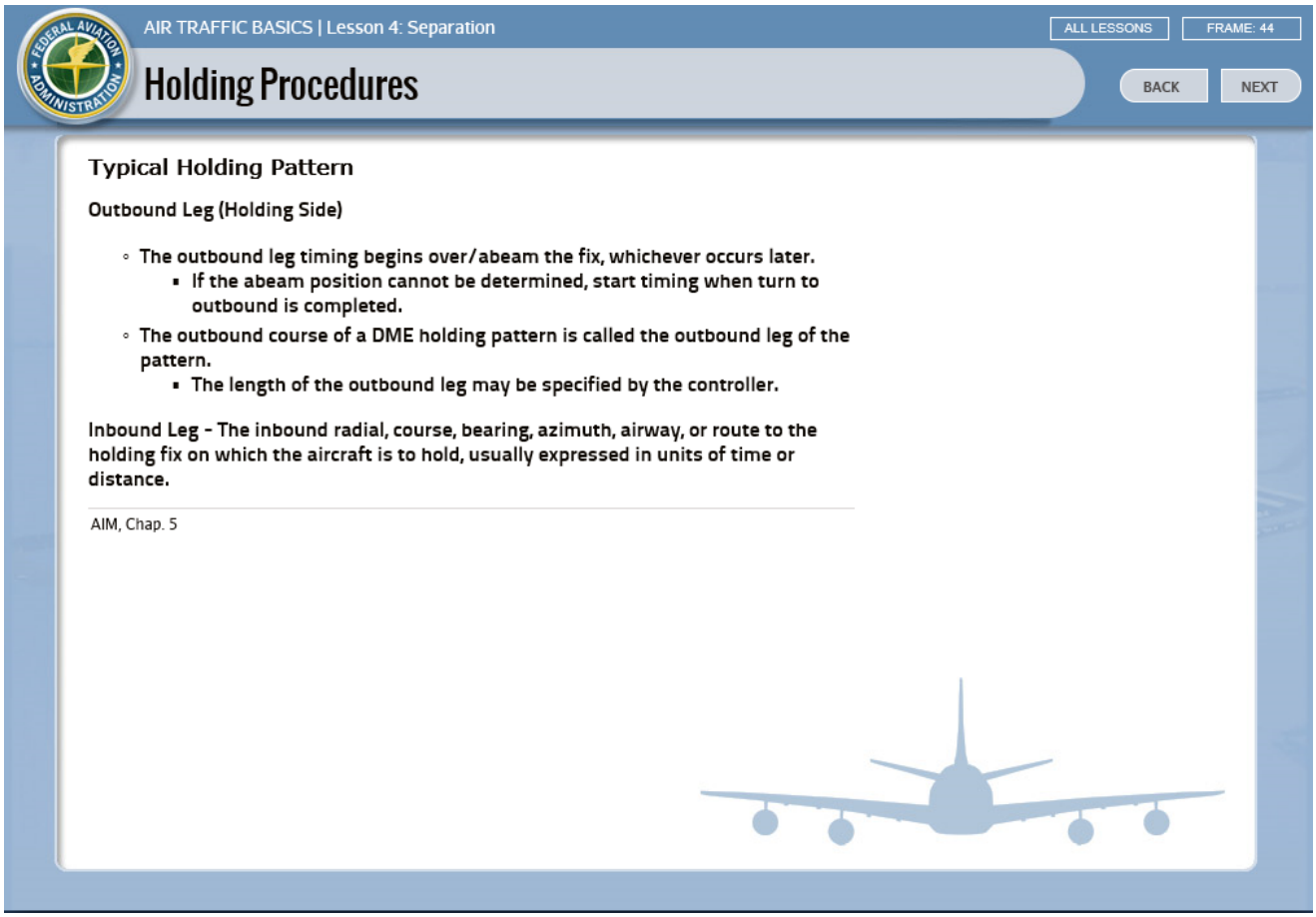
Abeam - An aircraft is "abeam" a fix, point, or object when that fix, point, or object is approximately 90 degrees to the right or left of the aircraft track. Abeam indicates a general position rather than a precise point.

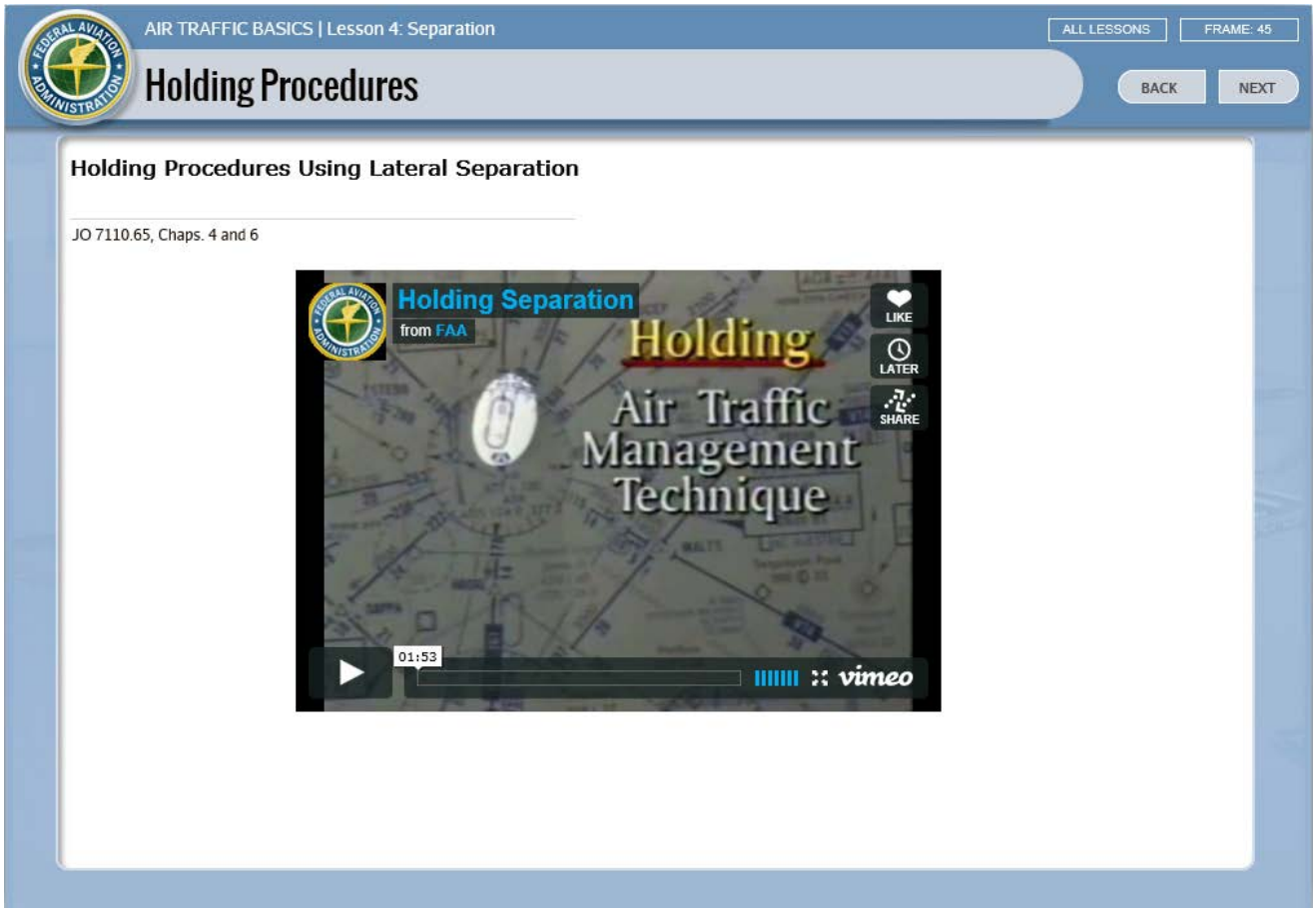
AIM, Chap. 5FAA-H-8083, Chap 10

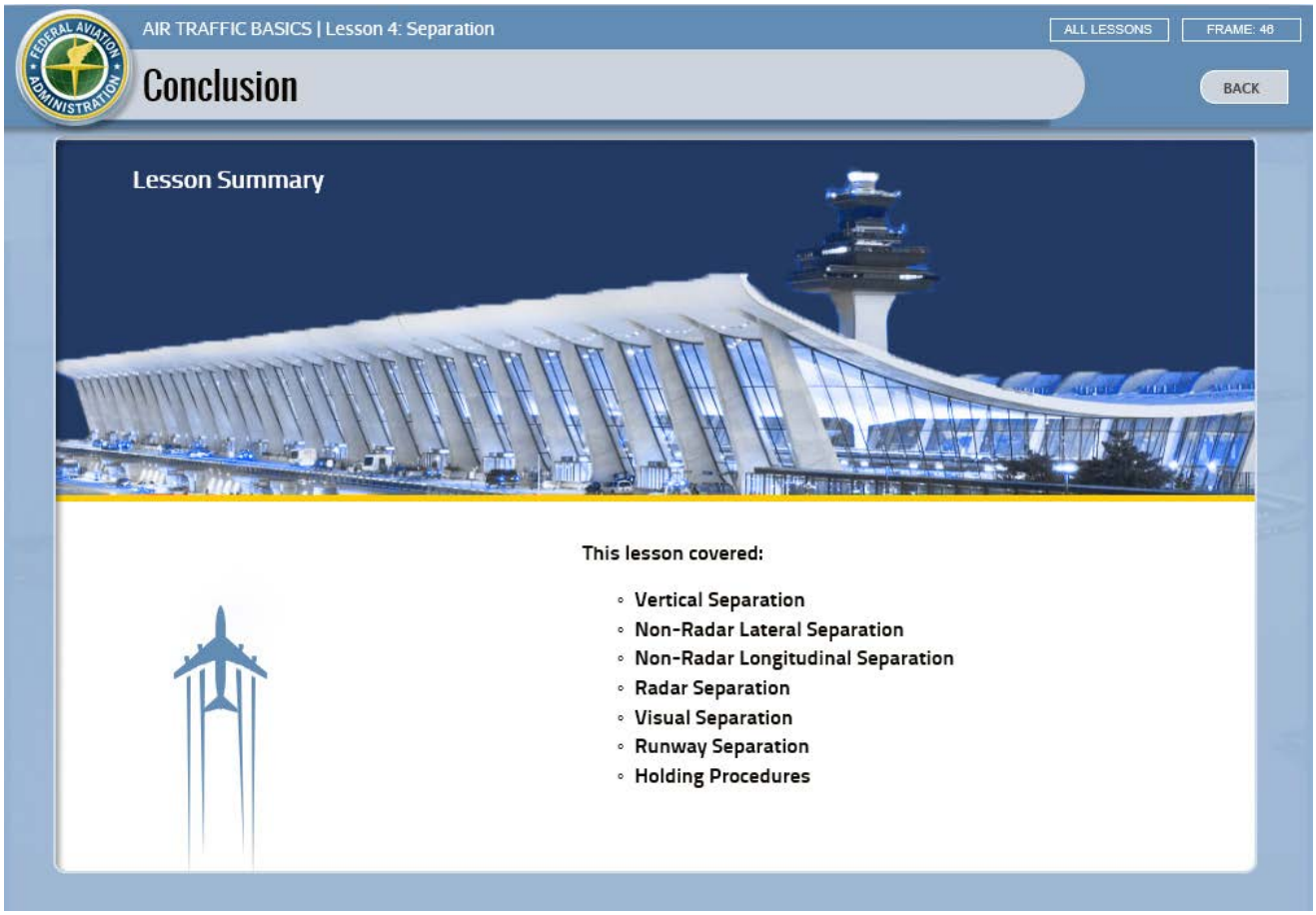



AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 42
Holding Procedures
BACK
NEXT
CLEARANCE LIMIT
9,000
8,000
7,000
6,000
HOLDING FIX
CLEARANCE LIMIT
9,000
8,000
7,000
6,000
HOLDING FIX
Holding Procedures Using Vertical Separation
Clear aircraft to hold over the same fix using vertical separation.
JO 7110.65,Chaps. 4 and 6


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 43
Holding Procedures
BACK
NEXT
V3
V4
V5
V6
COYLE
JONES
BOLEY
OKC
030
045
065
090
Holding pattern airspace must NOT overlap.
Left-hand pattern airspace does NOT overlap.
Holding Procedures Using Lateral Separation
Clear aircraft to hold over different fixes, at the same altitude, whose holding pattern airspace areas do not overlap:
Each other
Other airspace to be protected
JO 7110.65, Chaps. 4 and 6


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 44
Holding Procedures
BACK
NEXT
Typical Holding Pattern
Outbound Leg (Holding Side)
◦ The outbound leg timing begins over/abeam the fix, whichever occurs later.
▪ If the abeam position cannot be determined, start timing when turn to outbound is completed.
◦ The outbound course of a DME holding pattern is called the outbound leg of the pattern.
▪ The length of the outbound leg may be specified by the controller.
Inbound Leg - The inbound radial, course, bearing, azimuth, airway, or route to the holding fix on which the aircraft is to hold, usually expressed in units of time or distance.
AIM, Chap. 5


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 45
Holding Procedures
BACK
NEXT
Holding Procedures Using Lateral Separation
JO 7110.65, Chaps. 4 and 6
Holding Separation
from FAA
Holding
Air Traffic Management Technique
LIKE
LATER
SHARE
01:53
vimeo


AIR TRAFFIC BASICS | Lesson 4: Separation
ALL LESSONS
FRAME: 48
Conclusion
BACK
Lesson Summary
This lesson covered:
Vertical Separation
Non-Radar Lateral Separation
Non-Radar Longitudinal Separation
Radar Separation
Visual Separation
Runway Separation
Holding Procedures