Federal Aviation Administration

Initial En Route Qualification Training

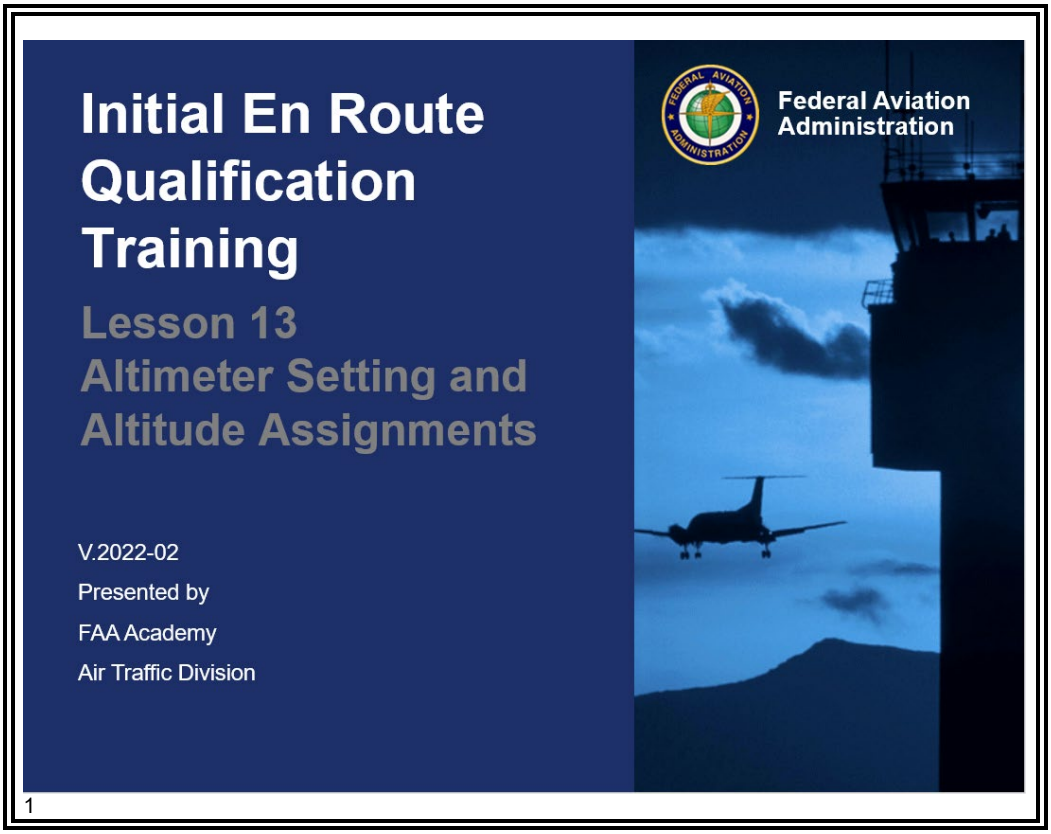
Lesson 13
Altimeter Setting and Altitude Assignment

Course 50148001

LESSON PLAN DATA SHEET

COURSE NAME:	INITIAL EN ROUTE QUALIFICATION TRAINING
COURSE NUMBER:	50148001
LESSON TITLE:	ALTIMETER SETTING AND ALTITUDE ASSIGNMENT
DURATION:	3+00 HOURS
DATE REVISED:	2022-02
VERSION:	V.2022-02
REFERENCE(S):	FAA ORDER JO 7110.65, AIR TRAFFIC CONTROL; FAR, PART 91.159, VFR CRUISING ALTITUDE OR FLIGHT LEVEL; FAA-H-8038-15A, INSTRUMENT FLYING HANDBOOK
HANDOUT(S):	ALTIMETER SETTING AND ALTITUDE ASSIGNMENTS
EXERCISE(S)/ ACTIVITY(S):	EXERCISE 1: ALTITUDE ASSIGNMENTS EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING
END-OF-LESSON TEST:	YES
PERFORMANCE TEST:	NONE
MATERIALS:	NONE
OTHER PERTINENT INFORMATION:	NONE

INTRODUCTION



In the Departure Procedures lesson, you learned how to transition an IFR aircraft from the ground into the en route environment. Once an aircraft has departed the airport, controllers **must** continue to issue altitude assignments. Altitude assignments **must** ensure that the aircraft maintains a safe distance, **not only** from other aircraft, but also from terrain, obstructions, or other airspace. You will also learn procedures to issue current and accurate altimeter settings.

Continued on next page

INTRODUCTION *(Continued)*

ALTIMETER SETTING AND ALTITUDE ASSIGNMENT REQUIREMENTS

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How do air traffic controllers determine proper altitudes to assign aircraft in order to provide separation from other aircraft? What factors affect these altitudes?

Purpose

This lesson will help you understand proper altitude assignment, restrictions, verification, and phraseology. In addition, you will learn the procedures for issuing current altimeter settings.

Lesson Objectives

LESSON OBJECTIVES

- On an End-of-Lesson Test, and in accordance with FAA Order JO 7110.65, you will identify procedures and phraseology for:
  - Issuing altimeter settings
  - Assigning altitudes
  - Confirming altitudes

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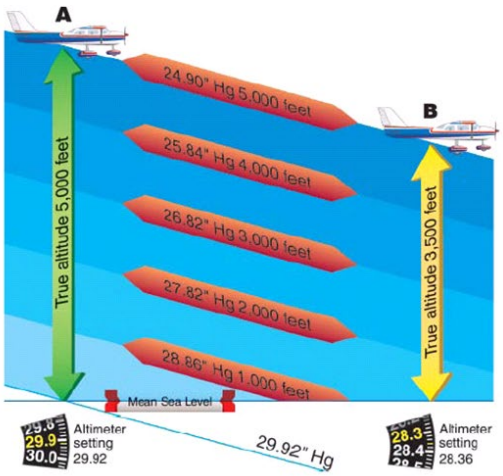
ALTIMETER SETTINGS

Altimeter Setting Definition
JO 7110.65, Pilot/Controller Glossary, FAA-H-8038-15A

ALTIMETER SETTINGS



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An **altimeter setting** is the barometric pressure reading used to adjust a pressure altimeter for variations in existing atmospheric pressure or to the standard altimeter setting (29.92).

Current Settings
JO 7110.65, par. 2-7-1, FAA-H-8038-15A

- Current altimeter settings must be obtained from weather reporting stations.
- Maintaining a current altimeter setting is critical because atmospheric pressure is **not** constant.
  - In one location the pressure might be higher than the pressure just a short distance away

NOTE: In areas where altimeters are fluctuating, the controller should be aware that altitudes for aircraft will also fluctuate; therefore, the controller may want to issue the altimeter more frequently than required by the JO 7110.65.

ALTIMETER SETTINGS *(Continued)*

Altimeter Setting Issuance
JO 7110.65, pars. 2-7-2, 4-5-4

⊙ Issue the current altimeter setting to:

- All en route aircraft operating below FL180 at least one time while operating within your area of jurisdiction
- Aircraft cleared to descend below the lowest usable flight level
  - Issue an altimeter setting obtained from the weather reporting station nearest the point the aircraft will descend through the lowest usable flight level
- Arriving aircraft approximately 50 miles from the destination if that airport is **not** served by an approach control facility
  - Issue destination altimeter setting

⊙ Use the following table to determine the lowest usable flight level to clear aircraft at or above 18,000 feet MSL.

ALTIMETER SETTING	LOWEST USABLE FL
29.92 or higher	180
29.91 to 28.92	190
28.91 to 27.92	200

⊙ Identify the source of the report.

⊙ State if the report is **more than** one hour old.

✈ **Phraseology**

"THE (facility name) ALTIMETER (setting) MORE THAN ONE HOUR OLD."

✈ **Phraseology Examples**

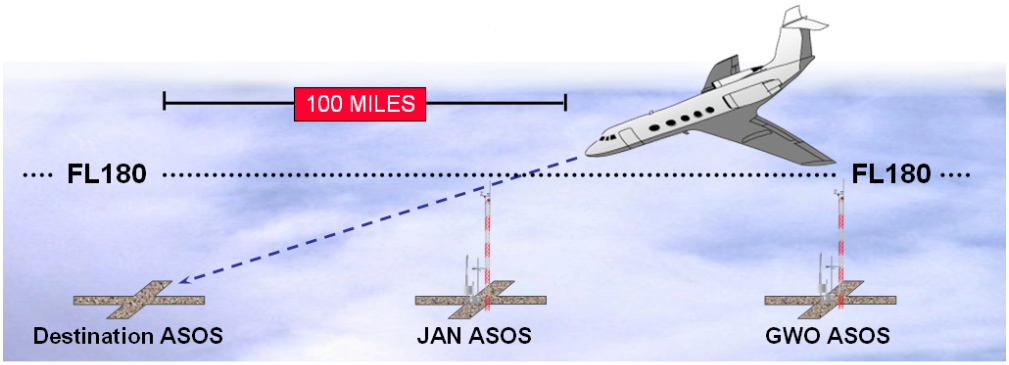
"The Jackson altimeter, two niner niner four."

"The Vicksburg altimeter two niner eight niner more than one hour old."

ALTIMETER SETTINGS *(Continued)*

Knowledge Check

KNOWLEDGE CHECK



QUESTION: Which altimeter setting should be issued?

A. Destination

B. JAN

C. GWO

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KNOWLEDGE CHECK

QUESTION: The current time is 1351Z. What is the phraseology for issuing the 1300Z Jackson altimeter setting of 29.92?

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ALTIMETER SETTINGS *(Continued)*

Knowledge Check (Cont'd)

KNOWLEDGE CHECK

QUESTION: The current time is 1730Z. What is the phraseology for issuing the 1600Z Vicksburg altimeter setting of 29.92?

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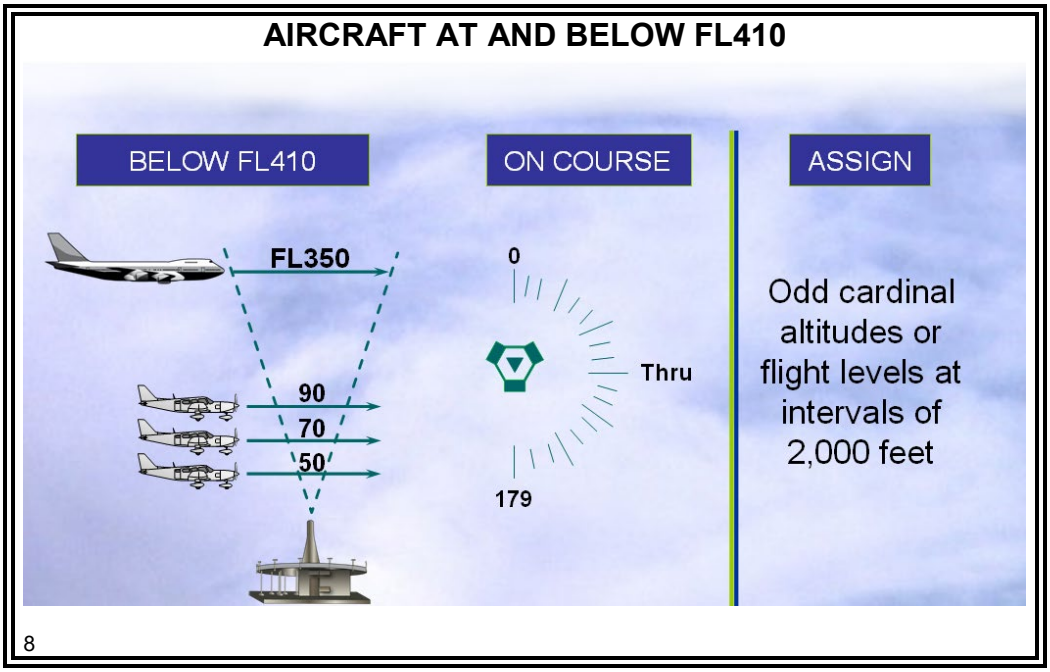
ALTITUDE ASSIGNMENT REQUIREMENTS

Altitude for Direction of Flight
JO 7110.65, par. 4-5-2, table 4-5-1



- For aircraft operating at and below FL410:
  - On course degrees magnetic 0 through 179, assign:
    - Odd cardinal altitudes or flight levels at intervals of 2,000 feet

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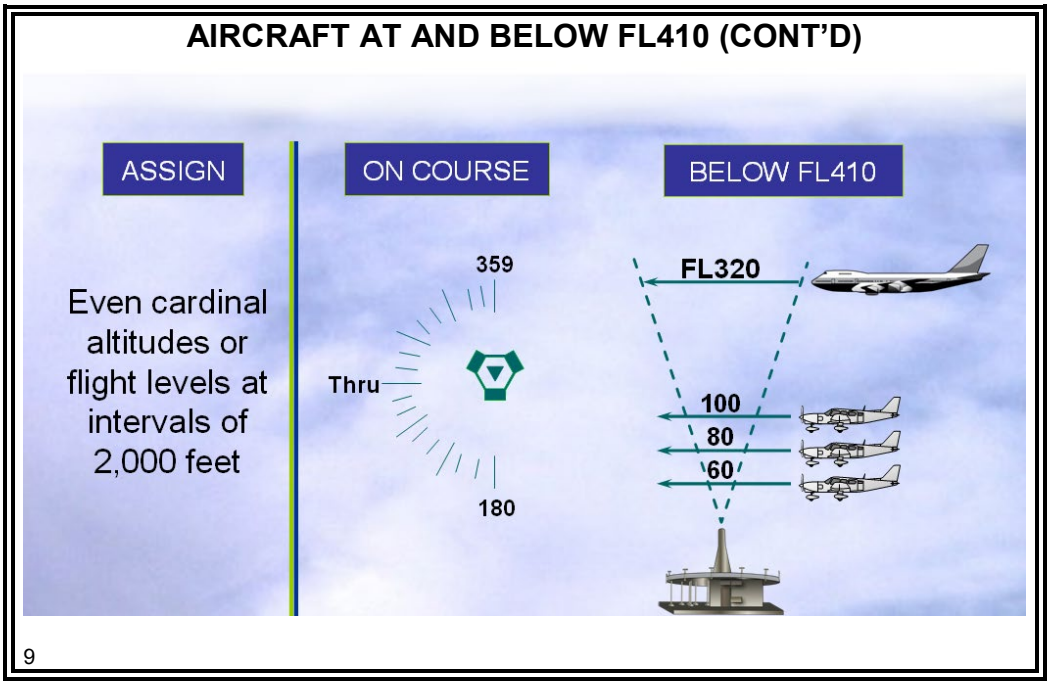
ALTITUDE ASSIGNMENT REQUIREMENTS *(Continued)*

Altitude for Direction of Flight (Cont'd)
JO 7110.65, par. 4-5-2, table 4-5-1



- On course degrees magnetic 180 through 359, assign:
  - Even cardinal altitudes or flight levels at intervals of 2,000 feet

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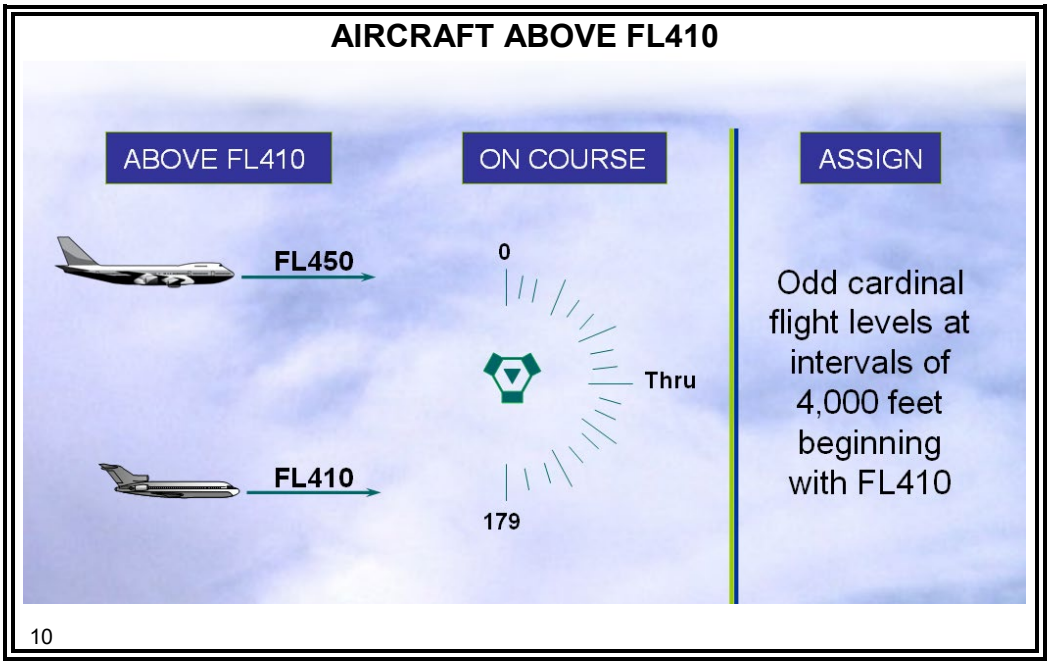
ALTITUDE ASSIGNMENT REQUIREMENTS *(Continued)*

Altitude for Direction of Flight (Cont'd)
JO 7110.65, par. 4-5-2, table 4-5-1



- For aircraft operating above FL410:
  - Course degrees magnetic 0 through 179, assign:
    - Odd cardinal flight levels at intervals of 4,000 feet beginning with FL410

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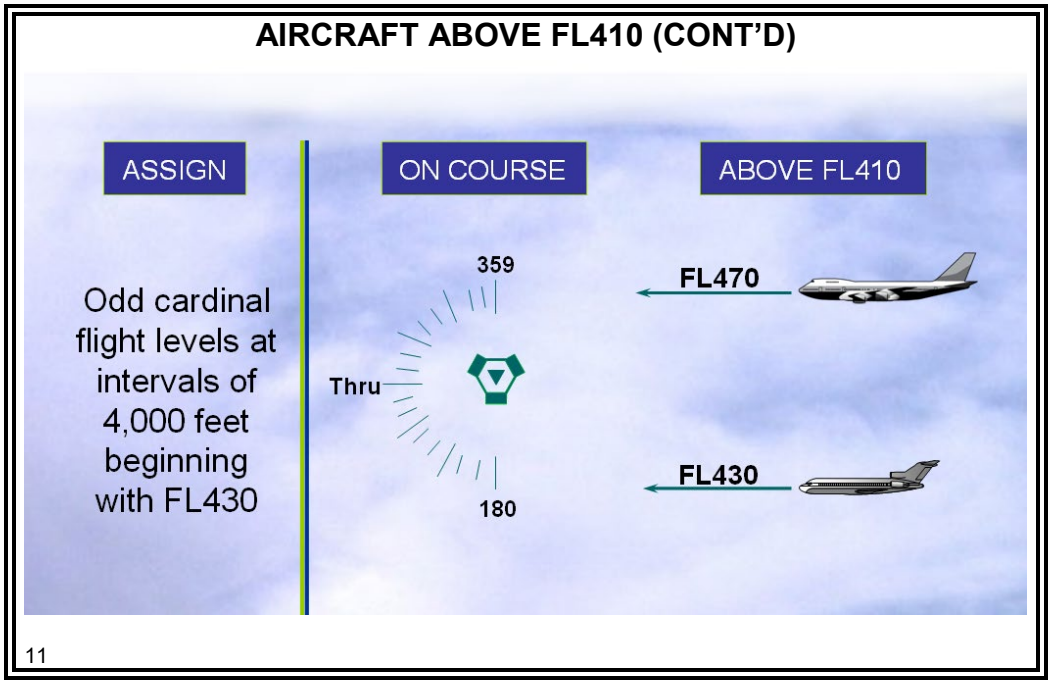
ALTITUDE ASSIGNMENT REQUIREMENTS *(Continued)*

Altitude for Direction of Flight (Cont'd)
JO 7110.65, par. 4-5-2, table 4-5-1



- On course degrees magnetic 180 through 359, assign:
  - Odd cardinal flight levels at intervals of 4,000 feet beginning with FL430

ALTITUDE ASSIGNMENT REQUIREMENTS *(Continued)*

Knowledge Check

KNOWLEDGE CHECK

QUESTION: An IFR aircraft flying a magnetic course of 330 degrees has requested a climb to 8,000. Is that an appropriate altitude for direction of flight? Explain.

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Exceptions
JO 7110.65, pars. 4-5-3, 2-1-2

- With **prior approval** from the affected sector or facility concerned, you may assign an altitude regardless of direction of flight as follows:
  - Traffic conditions prevent the assignment of an appropriate altitude
    - Specific procedures are covered in facility directives and/or inter-facility LOAs
  - The aircraft is experiencing meteorological conditions (e.g., icing, turbulence, weather activity)

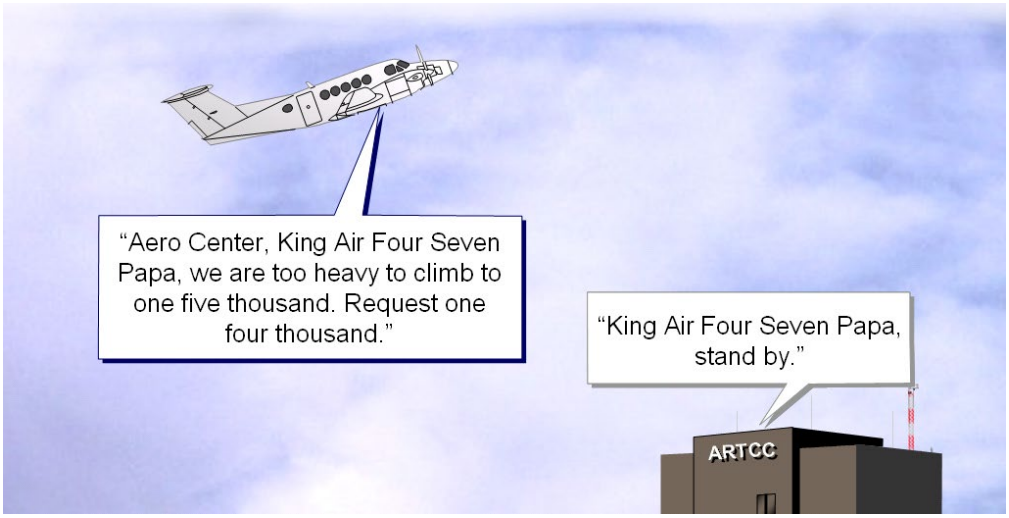
NOTE: Because meteorological conditions can deteriorate into an emergency situation, they warrant priority consideration. (Reference FAA Order JO 7110.65 par. 2-1-2)

- A military aircraft is operating on a random route
- The pilot informs you the available appropriate altitude exceeds the aircraft's operational limitations

ALTITUDE ASSIGNMENT REQUIREMENTS *(Continued)*

Exceptions Example
JO 7110.65, par. 4-5-3

EXCEPTION TO THE FLIGHT DIRECTION RULE



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REQUEST APPROVAL FROM NEXT SECTOR OR ADJACENT FACILITY

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ALTITUDE ASSIGNMENT REQUIREMENTS *(Continued)*

Stripmarking
JO 7110.65,
par. 2-3-10,
fig. 2-3-7

INAPPROPRIATE ALTITUDE FOR DIRECTION OF FLIGHT (IAFDOF)

N47P BE20/A T230 G225 66 **246** 01	MLU 0044	08 01 MHZ	~~150~~ 140	ZAMMA	KPSN./.MLU V18 MHZ V245 IGB KUBS/0220	4676

Underline the altitude in **RED**.

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EXERCISE 1: ALTITUDE ASSIGNMENTS

Exercise 1

ALTITUDE ASSIGNMENTS EXERCISE

Purpose: to identify the appropriate altitude assignments for aircraft

Directions: review the given flight progress strips and answer the questions

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Directions

Items 1 through 7 are short answer. Write your answers in the spaces provided. You may refer to your Aero Center Airspace Map and the Altitude Assignment Table in the appendix of this document, if needed.

Questions

QUESTION 1: Has United Twenty been assigned an appropriate altitude for direction of flight?

UAL20 B738/I T410 G425 66 **477** 02	MEI 1810	19 18 MHZ	100	GLH	KMEI V18 MHZ V74 KGLH	4465

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EXERCISE 1: ALTITUDE ASSIGNMENTS *(Continued)*

Questions (Cont'd)

QUESTION 2: Would the requested altitude for November One Two Three Foxtrot be appropriate?

N123F PA27/A T160 66 **322** 01		↑ KGWO P1200		MHZ 70	KGWO SQS V9 MHZ KJAN/0027	3241

QUESTION 3: Has November Five Zero Zero Yankee been assigned an appropriate altitude for direction of flight?

N500Y M20P/A T160 G165 66 **120** 03	IGB 1000	48 10 ↓ SQS	80	KGWO 1055	KUBS IGB V278 SQS KGWO	1025

QUESTION 4: Has Air Force One Six Two Three Four been assigned an appropriate altitude for direction of flight?

A16234 T38/P T480 G500 66 **711** 03	TXK 1221	33 12 SQS	280	IGB	KAMA TXK J52 IGB KCBM	0612

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EXERCISE 1: ALTITUDE ASSIGNMENTS *(Continued)*

Questions (Cont'd)

QUESTION 5: What appropriate altitudes between 110 and FL180 can be assigned to Turk One One?

TURK11 F16/P T510 66 **228** 01		↑ KJAN P1705		HEZ ???	KJAN MHZ V245 AEX KEFD	4327 ZCH

QUESTION 6: Has American Forty-Four been assigned an appropriate altitude for direction of flight?

AAL44 MD88/L T430 G410 66 **201** 02	DORTS 1622	30 16 MHZ	170	ZAMMA	KDAL MLU V417 MHZ V245 IGB KUBS	1037

QUESTION 7: What altitudes below 10,000 can be assigned to November One Two One Romeo Bravo?

N121RB BE65/B T165 66 **514** 01		↑ KJAN P0600		HATER ???	KJAN V427 MLU V18 EIC KSHV/0101	0331

ALTITUDE ASSIGNMENT PHRASEOLOGY

Instructions to Climb or Descend
JO 7110.65, par. 4-5-7

INSTRUCTIONS TO CLIMB

ATC: Southwest Twenty-Three, climb and maintain one three thousand.
SWA23: Southwest Twenty-Three, climb and maintain one three thousand.
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⊙ Issue instructions to climb or descend, including restrictions if required, as follows:

- Specify time restriction reference the UTC clock and issue a time check
- If you are in direct, two-way, VHF/UHF voice communication with the pilot and the aircraft is in radar contact, you may specify an elapsed time interval restriction, in full minute increments only, without any reference to the UTC clock.

✈ **Phraseology**

"CLIMB/DESCEND AND MAINTAIN (altitude). if required,

AFTER PASSING (fix, waypoint), or AT (time) (time in hours, minutes, and nearest quarter minute)."

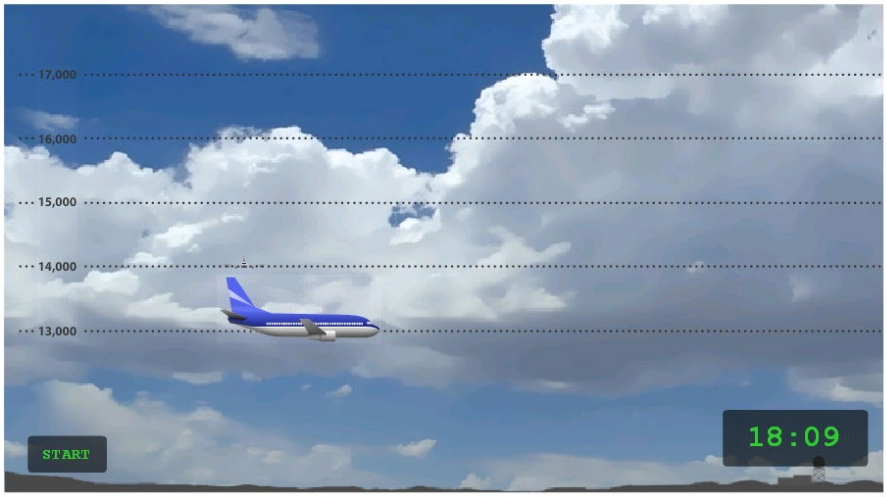
"CLIMB/DESCEND TO REACH (altitude) AT (time [issue time check] or fix, waypoint)."

"CLIMB/DESCEND TO REACH (altitude) within two minutes".

ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Altitude to Maintain or Cruise Instructions
JO 7110.65, par. 4-5-7

ALTITUDE TO MAINTAIN



ATC: Delta Ten maintain one three thousand until one eight one two, climb and maintain one five thousand, time one eight one zero.

DAL10: Delta Ten maintain one three thousand until one eight one two, climb and maintain one five thousand.

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⊙ Issue altitude to maintain or cruise instructions as follows:

✈ **Phraseology**

“MAINTAIN/CRUISE (altitude).”

“MAINTAIN (altitude) UNTIL (time [issue time check], fix, waypoint).”

“CROSS (fix, point, waypoint) AT or ABOVE/BELOW (altitude), CRUISE (altitude).”

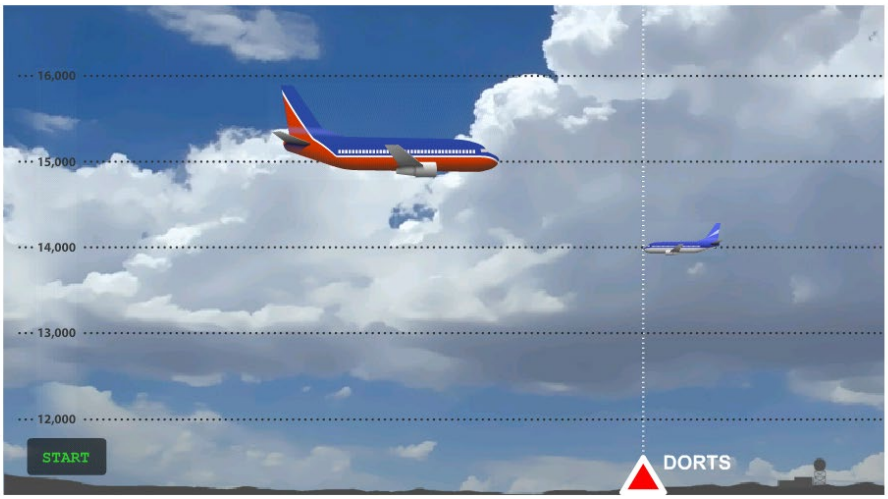
“INTERCEPT (route) AT OR ABOVE/BELOW (altitude), CRUISE (altitude).”

ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Instructions to Climb or Descend
JO 7110.65, par. 4-5-7

INSTRUCTIONS TO DESCEND

Example 1



ATC: American Fourteen Twenty-Three, maintain one five thousand until DORTS, descend and maintain one three thousand.

AAL1423: American Fourteen Twenty-Three, maintain one five thousand until DORTS, descend and maintain one three thousand.

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ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Instructions to Climb or Descend (Cont'd)
JO 7110.65, par. 4-5-7

INSTRUCTIONS TO DESCEND

Example 2

ATC: November Two Five Papa, descend to reach six thousand at or before zero eight one four, time zero eight one one.

N25P: November Two Five Papa, descend to reach six thousand at or before zero eight one four.

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ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Assignment of Specified Altitude Over Fix or Waypoint
JO 7110.65, par. 4-5-7

SPECIFIC ALTITUDE OVER FIX

ATC: November Two Five Papa, cross Sidon VORTAC at and maintain one zero thousand.

N25P: November Two Five Papa, cross Sidon VORTAC at and maintain one zero thousand.

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⊙ Assign a specified altitude over a specified fix or waypoint as follows:

✈ **Phraseology**

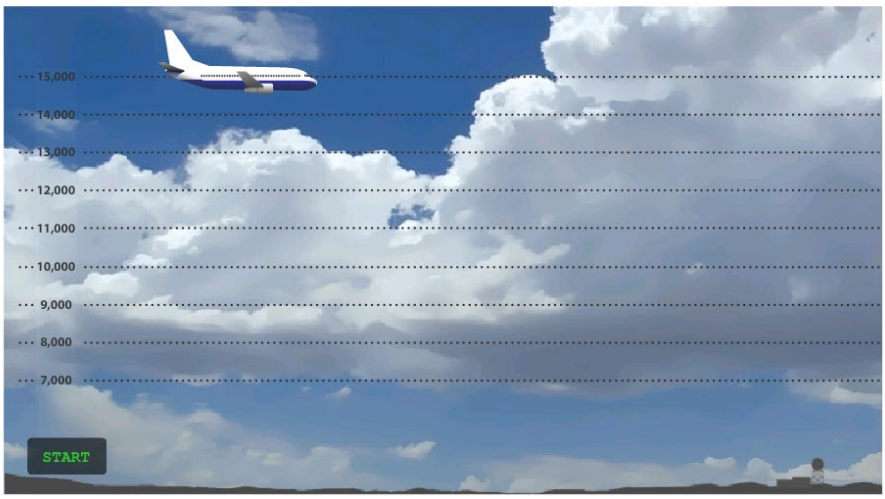
"CROSS (fix, waypoint) AT (altitude)"

"CROSS (fix, waypoint) AT OR ABOVE/BELOW (altitude)"

ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Pilot's Discretion
JO 7110.65, par. 4-5-7

PILOT'S DISCRETION DESCENT



ATC: United Two Twelve cross Magnolia VORTAC at and maintain 7000.
UAL212: United Two Twelve cross Magnolia VORTAC at and maintain 7000.

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⊙ Assign a clearance to climb/descend at pilot's discretion as follows:

✈ **Phraseology**

"CLIMB/DESCEND AT PILOT'S DISCRETION"

NOTE: Crossing restrictions, approach clearances, and cruise clearances allow for descent at pilot's discretion.

Continued on next page

ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Pilot's Discretion (Cont'd)
JO 7110.65, par. 4-5-7

⊙ Portion of climb/descent may be authorized at pilot's discretion.

- Specify altitude to which aircraft **must** climb/descend, followed by altitude to maintain at pilot's discretion

✈ **Phraseology**

"CLIMB/DESCEND NOW TO (altitude), THEN CLIMB/DESCEND AT PILOT'S DISCRETION, MAINTAIN (altitude)."

NOTE: Pilot's discretion, when used in conjunction with altitude assignments, means that ATC has offered the pilot the option of starting climb or descent whenever he/she wishes and conducting the climb or descent at any rate he/she wishes. He/she may temporarily level off at any intermediate altitude. However, once he/she has vacated an altitude, he/she may **not** return to that altitude. When you issue a pilot's discretion clearance, you **must** protect more altitudes for a longer period of time.

Canceling Pilot's Discretion
JO 7110.65, par. 4-2-5

⊙ When canceling pilot's discretion portion of a climb/descent clearance:

- Assign a new altitude and inform the pilot that the new altitude is an amended altitude

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Route Or Altitude Amendments
JO 7110.65, par. 4-2-5

⊙ When a route or altitude in a previously issued clearance is amended, restate all applicable restrictions.

ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Assigning More Than One Altitude
JO 7110.65, par. 4-5-7

ASSIGNING MORE THAN ONE ALTITUDE

ATC: Yukon One Five, maintain block one five thousand through one seven thousand.
Yukon15: Yukon One Five, maintain block one five thousand through one seven thousand.

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⊙ Assign **more than** one altitude as follows:

✈ **Phraseology**

"MAINTAIN BLOCK (altitude) THROUGH (altitude)"

ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Instructions When Pilot Cannot Accept Clearance
JO 7110.65, par. 4-5-7

⊙ When a pilot is unable to accept a clearance:

- Issue revised instruction to ensure positive control and approved separation

NOTE:

1. 14 CFR Section 91.123 states that a pilot is **not** allowed to deviate from an ATC clearance “that has been obtained...unless an amended clearance is obtained” (except when an emergency exists).

2. A pilot is therefore expected to advise the controller if a clearance **cannot** be accepted when the clearance is issued. “We will try” and other such acknowledgements do **not** constitute pilot acceptance of an ATC clearance.

3. Controllers are expected to issue ATC clearances which conform with normal aircraft operational capabilities and do **not** require “last minute” amendments to ensure standard separation.

4. “Expedite” is **not** to be used in lieu of appropriate restrictions to ensure separation.

ALTITUDE ASSIGNMENT PHRASEOLOGY *(Continued)*

Anticipated Altitude Change
JO 7110.65, par. 4-5-8

⊙ Inform aircraft when to:

- Expect climb/descent clearance, or
- Request altitude change from another facility

✈ **Phraseology**

“EXPECT HIGHER/LOWER IN (number of miles or minutes) MILES/MINUTES,

or

AT (fix).”

“REQUEST ALTITUDE/FLIGHT LEVEL CHANGE FROM (name of facility).

if required,

AT (time, fix, or altitude).”

Knowledge Check

KNOWLEDGE CHECK

QUESTION: N46P is westbound on V278 at six thousand requesting one zero thousand. In order to protect traffic southbound on V9 at seven thousand, you determine that a 6-mile crossing restriction northeast of Sidon is necessary. What is the proper phraseology to issue this clearance?

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EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING

Exercise 2

ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING EXERCISE

Purpose: to practice issuing altitude clearances and using altitude assignment phraseology

Directions: review the given flight progress strips, mark the strips with the appropriate altitude clearance, then write the correct phraseology

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Directions

For items 1 through 4, write the altitude assignment phraseology indicated by the flight progress strip shown. For items 5 through 8, mark the strips accordingly based on the altitude clearances provided.

NOTE: For the purpose of this exercise, **no** coordination is shown on the flight progress strips.

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EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING *(Continued)*

Questions

EXERCISE 2 – QUESTION 1

N512Y BE35/B T195 66 01		↑ KGWO P1700	↑90 X8NE SQS ↡70	HLI 90	KGWO SQS V535 HLI M41/0051	D-A

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EXERCISE 2 – QUESTION 2

UAL27 A319/L T420 G410 66 **126** 01	GLH 1803	14 18 MHZ	170✓↓150 170/26 SE GLH	MEI	KPBF./.GLH V74 MHZ V18 KMEI	4010

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EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING *(Continued)*

Questions (Cont'd)

EXERCISE 2 – QUESTION 3

SWA28 B733/I T420 66 **523** 01		↑ KGWO P1700	↑100 X7SW SQS ↡60	MHZ 100	KGWO SQS V557 MHZ V245 KHEZ	4521 D-A

35

EXERCISE 2 – QUESTION 4

JOKER06 C130/A T310 G300 66 **701** 03	IGB 1957	22 20 SQS	80✓↑100 80/14 NE	GLH	KCBM IGB V278 GLH KLRF	4522

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Continued on next page

EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING *(Continued)*

Questions (Cont'd)

EXERCISE 2 – QUESTION 5

Mark the strip accordingly based on the clearance provided below.

UAL57 A320/I T460 G470 66 **227** 01	HEZ 1849	03 19 MHZ	150✓	ZAMMA	KBTR HEZ V245 IGB KGTR	4523

"United Fifty-Seven, climb and maintain one seven thousand."

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EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING *(Continued)*

Questions (Cont'd)

EXERCISE 2 – QUESTION 6

Mark the strip accordingly based on the clearance provided below.

AAL27 CRJ7/L T420 G405 66 **506** 03	UJM 0202	12 02 SQS	170✓	MHZ	KMEM UJM V9 MHZ V11 KMOB	5232

"American Twenty-Seven, maintain one seven thousand until one seven miles southeast Sidon VORTAC, descend and maintain one five thousand."

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EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING *(Continued)*

Questions (Cont'd)

EXERCISE 2 – QUESTION 7

Mark the strip accordingly based on the clearance provided below.

KING11 C130/A T310 66 **722** 01		↑ KGWO P0015		MHZ 120	KGWO SQS V11 MHZ V245 AEX KEFD	3445 D-A

"King One One, …cross five miles southeast Sidon VORTAC at or below six thousand, climb and maintain one two thousand."

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NOTE: The departure clearance has been issued with the destination airport as the clearance limit.

Continued on next page

EXERCISE 2: ALTITUDE ASSIGNMENT PHRASEOLOGY AND STRIPMARKING *(Continued)*

Questions (Cont'd)

EXERCISE 2 – QUESTION 8

Mark the strip accordingly based on the clearance provided below.

UAL33 A319/I T440 G410 66 **514** 01	STUEE 2108	20 21 MHZ	170✓	MEI	KSHV EIC V18 MEI KMGM	2023

"United Thirty-Three, maintain one seven thousand until eight miles southeast Magnolia VORTAC, descend and maintain one three thousand."

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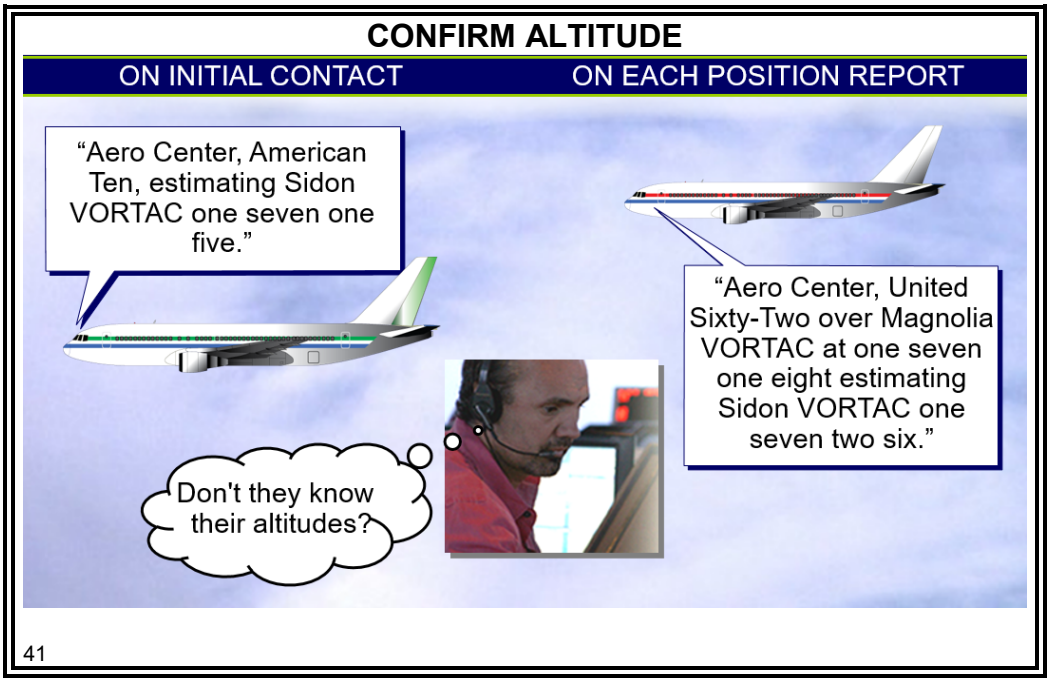
ALTITUDE ASSIGNMENT CONFIRMATION

Altitude Confirmation Requirements (Nonradar)
JO 7110.65, par. 4-5-9



- On initial contact, or when position reports are received, request a pilot to confirm his/her assigned altitude unless:
  - The pilot states the assigned altitude on initial contact
  - You assign a new altitude to a climbing or descending aircraft

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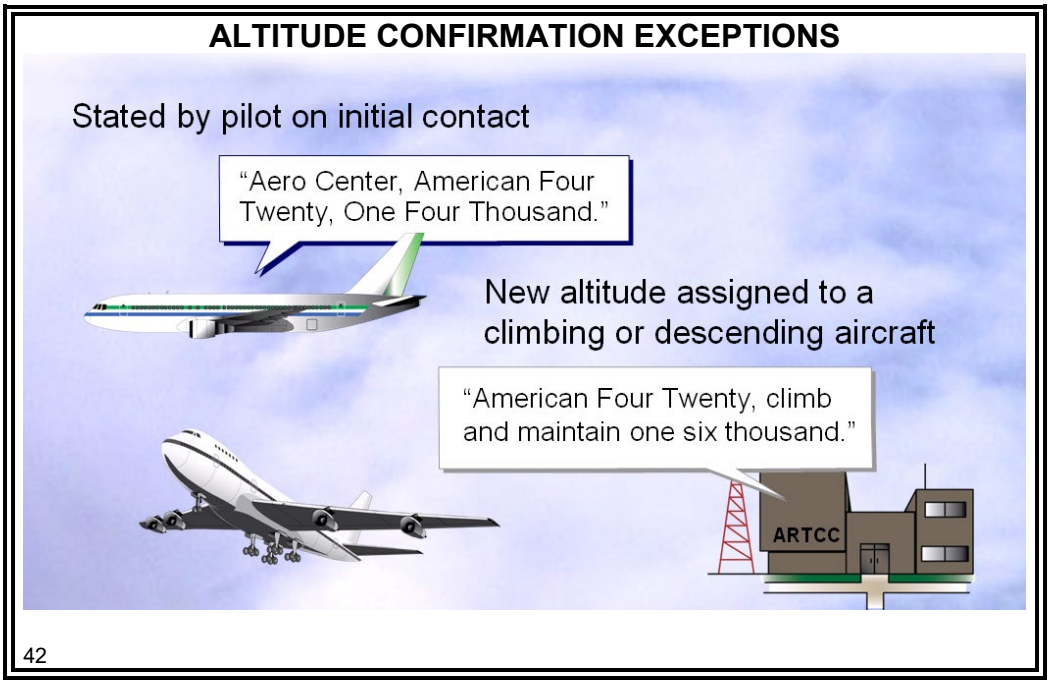
ALTITUDE ASSIGNMENT CONFIRMATION *(Continued)*

Altitude Confirmation Requirements (Nonradar) (Cont'd)
JO 7110.65, par. 4-5-9



Altitude Confirmation Phraseology (Nonradar)
JO 7110.65, par. 4-5-9

⊙ Ask for altitude assignment verification in the following situations:

- In level flight situations:

✈ **Phraseology**

"VERIFY AT (altitude/flight level)"

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ALTITUDE ASSIGNMENT CONFIRMATION *(Continued)*

Altitude Confirmation Phraseology (Nonradar) (Cont'd)
JO 7110.65, par. 4-5-9

ALTITUDE CONFIRMATION PHRASEOLOGY

✈ **Phraseology Example**

ATC: United Two Ten verify assigned altitude one five thousand.

UAL210: United Two Ten is out of one four thousand three hundred climbing to one five thousand.

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- In climbing or descending situations if aircraft has been assigned an altitude below the lowest usable flight level:

✈ **Phraseology**

"VERIFY ASSIGNED ALTITUDE (altitude)."

- If aircraft has been assigned a flight level at or above the lowest usable flight level

✈ **Phraseology**

"VERIFY ASSIGNED FLIGHT LEVEL (flight level)."

IN CONCLUSION

Lesson Review

LESSON REVIEW

The following topics were covered in this lesson:

- Altimeter settings
- Altitude assignment requirements
- Altitude assignment phraseology
- Altitude assignment confirmation

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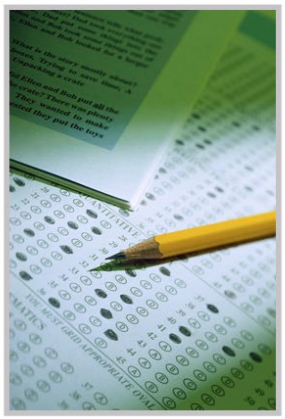
End-of-Lesson Test

END OF LESSON TEST

Altimeter Setting and Altitude Assignments



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APPENDIX: ALTITUDE ASSIGNMENT TABLE

Altitude Assignment Table
JO 7110.65, par. 4-5-2, table 4-5-1

AIRCRAFT OPERATING	ON COURSE DEGREES MAGNETIC	ASSIGN	EXAMPLES
Below 3,000 feet above surface (AGL)	Any course	Any altitude	** ***Not*** *used in Aero Center Airspace*
At and below FL410	0 through 179	**Odd** cardinal altitude or flight levels at intervals of 2,000 feet	3,000 feet, 5,000 feet, FL310, FL330
	180 through 359	**Even** cardinal altitudes or flight levels at intervals of 2,000 feet	4,000 feet, 6,000 feet, FL320, FL340
Above FL410	0 through 179	**Odd** cardinal flight levels at intervals of 4,000 feet beginning with FL410	FL450, FL490, FL530
	180 through 359	**Odd** cardinal flight levels at intervals of 4,000 feet beginning with FL430	FL430, FL470, FL510
One-way routes (except in composite systems)	Any course	Any cardinal altitude or flight level below FL410 or any odd cardinal flight level above FL410	FL270, FL280, FL290, FL300, FL310, FL410, FL430, FL450
Within an ALTRV	Any course	Any altitude or flight level	
In transition to/from or within Oceanic airspace where composite separation is authorized	Any course	Any odd or even cardinal flight level including those above FL290	FL280, FL290, FL300, FL310, FL320, FL330, FL340
In aerial refueling tracks and anchors	Any course	Altitude blocks as requested. Any altitude or flight level	050B080, FL180B220, FL280B310
Aircraft within RVSM or RVSM transition airspace	Any course	Any designated cardinal altitude	FL330, FL340, FL350, FL360