



**Federal Aviation
Administration**

Initial En Route Qualification Training

Lesson 11 Route Assignments

Course 50148001

LESSON PLAN DATA SHEET

COURSE NAME: INITIAL EN ROUTE QUALIFICATION TRAINING
COURSE NUMBER: 50148001

LESSON TITLE: ROUTE ASSIGNMENTS

DURATION: 3+30 HOURS

DATE REVISED: 2022-02
VERSION: V.2022-02

REFERENCE(S): FAA ORDER JO 7110.65, AIR TRAFFIC CONTROL; FAA ORDER JO 7110.10, FLIGHT SERVICES; AERONAUTICAL INFORMATION MANUAL (AIM)

HANDOUT(S): NONE

**EXERCISE(S)/
ACTIVITY(S):** ACTIVITY: FIX RADIAL DISTANCE
EXERCISE: ALTITUDE STRATUM

**END-OF-LESSON
TEST:** YES

**PERFORMANCE
TEST:** NONE

MATERIALS: NONE

**OTHER PERTINENT
INFORMATION:**

DISCLAIMER


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INTRODUCTION


Initial En Route Qualification Training

Lesson 11 Route Assignments

V.2022-02
Presented by
FAA Academy
Air Traffic Division



Federal Aviation
Administration



1

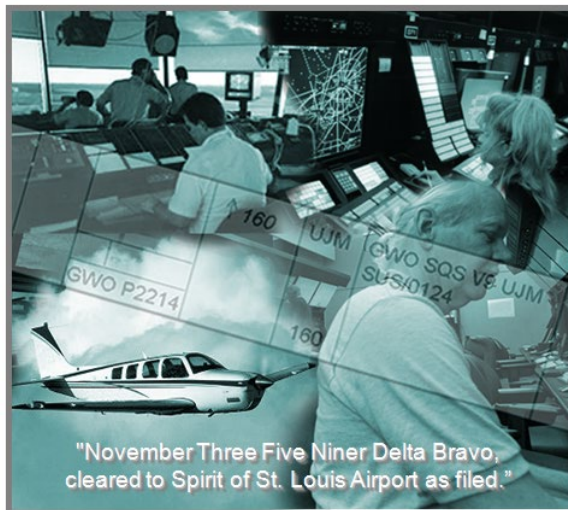
As you proceed through this course, you continue to add skills that are required of all air traffic controllers. This lesson on IFR clearances and route assignment covers critical air traffic control functions.

Mastery of these skills will ensure that pilots have **no** doubt as to what you expect them to do. You will use skills learned in previous lessons to accurately issue clearances and route assignments.

Continued on next page

INTRODUCTION *(Continued)*

ROUTE ASSIGNMENTS



2

In earlier lessons, you were introduced to Air Traffic Control (ATC) clearances and the role they play in the ATC system. ATC clearances are employed by all controllers to maintain a safe, orderly, and expeditious flow of air traffic. In this lesson, we will focus on ATC clearances as they apply in the en route environment.

Purpose

This lesson covers IFR clearance items, route/altitude amendments, and clearance prefixes.

INTRODUCTION *(Continued)*

Lesson Objectives

LESSON OBJECTIVES

- On an End-of-Lesson Test and in accordance with FAA Order JO 7110.65, you will identify:
 - Clearance and route assignment procedures for IFR aircraft
 - Phraseology for issuing selected clearances
 - Fix radial distance locations

3

CLEARANCE PREFIXES

Prefix

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



Phraseology

- ⊙ Prefix a clearance, information, or a request for information which will be relayed to an aircraft through a non-ATC facility by stating:

- “ATC clears” (Clearance)
- “ATC advises” (Information)

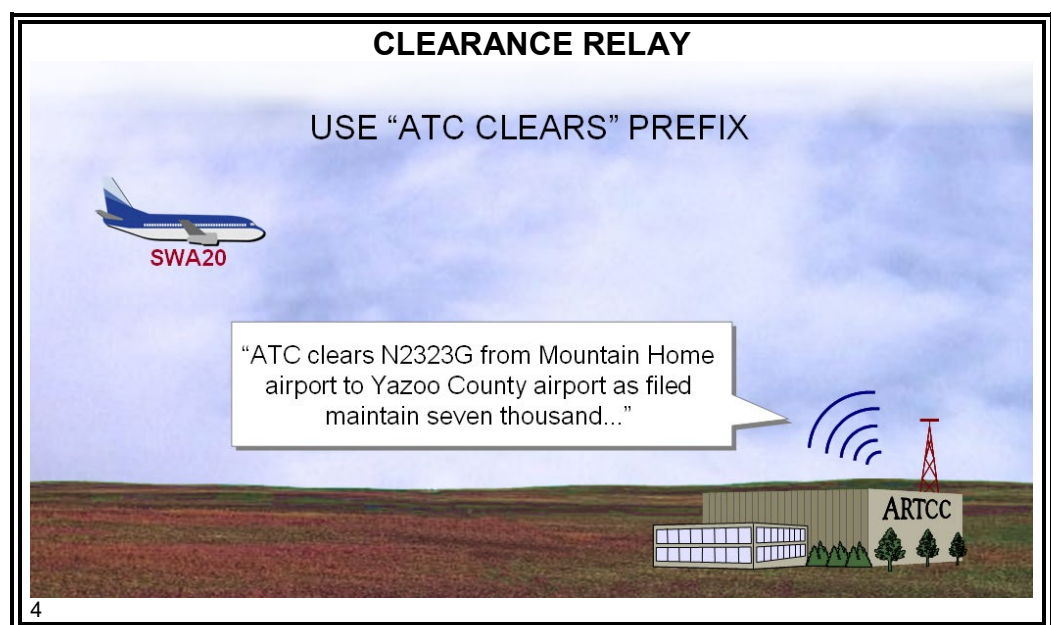
Example: Weather information, delays at destination, etc.

- “ATC requests” (Request)

Example: Requests for flight conditions, altitude, etc.



Phraseology Example



- ⊙ FDU **must** prefix a clearance with the appropriate phrase:

- “ATC clears”
- “ATC advises”
- “ATC requests”



Phraseology

- ⊙ Relay clearances verbatim.
-

CLEARANCE PREFIXES *(Continued)*

Knowledge Check

KNOWLEDGE CHECK

❖ **QUESTION:** What prefix phrase should you use to relay a clearance to an aircraft through another aircraft?










- A. "ATC clears."
- B. "ATC relays."
- C. "ATC advises."

5

ROUTE ASSIGNMENT

Definitions

JO 7110.65,
Pilot/Controller
Glossary;
JO 7110.10,
par. 6-3-3

-  An **airway** is a Class E airspace area established in the form of a corridor, the centerline of which is defined by radio navigational aids; e.g., V278.
-  A **fix radial distance (FRD)** is a geographical position determined by a fix (up to 5 characters), an azimuth from the fix (3 digits in degrees magnetic), and a distance from the fix in nautical miles (3 digits).
- Examples:** SQS270040
HATER045012
-  A **route** is a defined path consisting of one or more courses in a horizontal plane, which aircraft traverse over the surface of the earth.
-  A **jet route** is a route designed to serve aircraft operations from 18,000 feet MSL up to and including flight level 450. The routes are referred to as “J” routes with numbering to identify the designated route; e.g., J35.
-  A **Q Route** is an Area Navigation (RNAV) route published for use in the United States.
-  A **vector** is a heading issued to an aircraft to provide navigational guidance by radar.
-  A **Preferential Arrival Route (PAR)** is a specific arrival route from an appropriate en route point to an airport or terminal area. **It may be included in a Standard Terminal Arrival (STAR) or a Preferred IFR Route.** The abbreviation “PAR” is used primarily within the ARTCC and should **not** be confused with the abbreviation for Precision Approach Radar.
-  A **Standard Terminal Arrival (STAR)** is a pre-planned Instrument Flight Rule (IFR) air traffic control arrival procedure published for pilot use in graphic and/or textual form. STARs provide transition from the en route structure to an outer fix or an instrument approach fix/arrival waypoint in the terminal area.
-  A **Standard Instrument Departure (SID)** is a preplanned instrument flight rule (IFR) air traffic control (ATC) departure procedure printed for pilot/controller use in graphic form to provide obstacle clearance and a transition from the terminal area to the appropriate en route structure. SIDs are primarily designed for system enhancement to expedite traffic flow and to reduce pilot/controller workload. ATC clearance **must always** be received prior to flying a SID.

Continued on next page

ROUTE ASSIGNMENT *(Continued)*

Route Use

JO 7110.65,
par. 4-4-1



Phraseology Example

DESIGNATED AIRWAY						
SWA20		↑	↑ 120	SQS	KJAN MHZ V9 KMEM	2575
B733/I						
T450						
66						
431	01	KJAN P1910		120		D-A

“Southwest Twenty, cleared to Memphis Airport via Victor Niner, climb and maintain one two thousand.”

6

- Clear aircraft via routes consistent with the altitude stratum in which the operation is to be conducted by one or more of the following:

- Designated airways and routes



Phraseology

“VIA”

VICTOR (COLOR) (airway number) (the word “ROMEO” when RNAV)

or

J (route number) (word “ROMEO” when RNAV).”

Continued on next page

ROUTE ASSIGNMENT *(Continued)*

Route Use (Cont'd)

JO 7110.65,
par. 4-4-1



Phraseology Example

DESIGNATED RADIALS OF AIRWAY							
AAL380			↑	↑ 220	SQS	KJAN MHZ V9 SQS J35 KMEM <i>RDLS</i>	2464
B738/I							D-A
T450							
02							
437	01		KJAN P2010		220		

7

“American Three Eighty, cleared to Memphis Airport, via radials of Victor Niner Sidon, J Thirty-Five, climb and maintain flight level two two zero.”

- Radials, courses, azimuths, or direct to or from NAVAIDs
 - To utilize an airway above/below its route structure
 - To define a route when an airway does **not** exist



Phraseology

“DIRECT.”

or

“VIA”

(name of NAVAID) (specified) RADIAL/COURSE/AZIMUTH

or

(fix) AND (fix)

or

RADIALS OF (airway or route) AND (airway or route).”

Continued on next page

ROUTE ASSIGNMENT *(Continued)*

Route Use (Cont'd)

JO 7110.65,
par. 4-4-1



Phraseology Example

REROUTE ON DEPARTURE VIA RADIALS						
N905T			↑ 160	MHZ	KGWO SQS-V9-MHZ V18	6654
WW24/I					EIC KSHV	
T440					SQS240R/ ⇒ MLU060R	
66					MLU	
477	01	KGWO P2205		160		D-A

“Westwind Niner Zero Five Tango, cleared to Shreveport Airport via direct Sidon, the Sidon two four zero radial, until intercepting Monroe zero six zero radial Monroe Victor Eighteen, then as filed, climb and maintain one six thousand.”

8

- Radials, courses, azimuths, and headings of departure or arrival routes

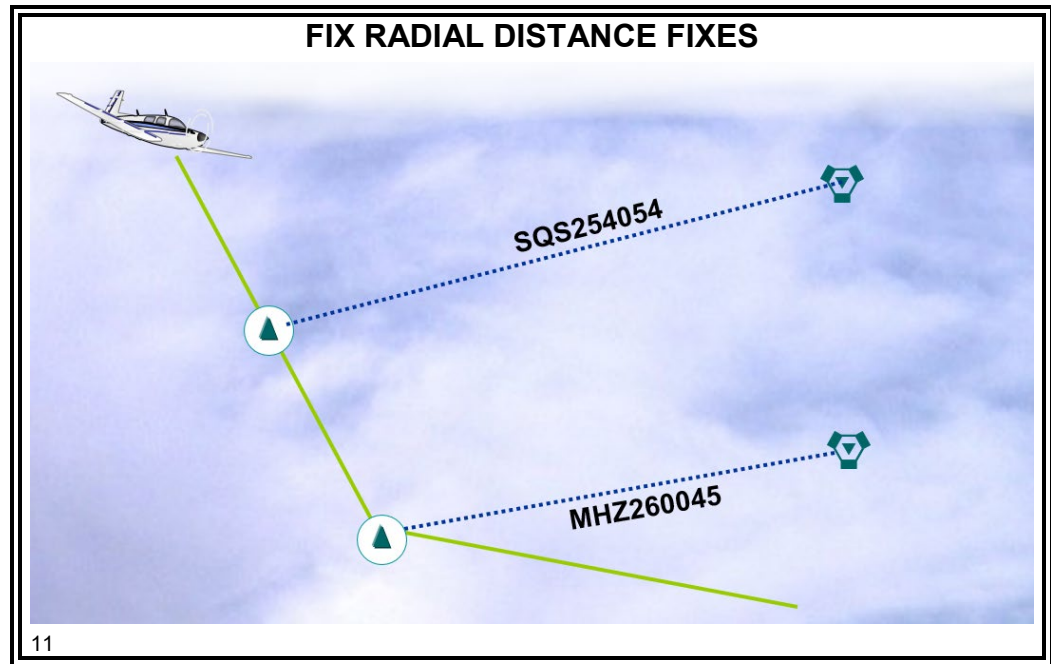
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ROUTE ASSIGNMENT *(Continued)*

Route Use (Cont'd)

JO 7110.65,
par. 4-4-1

- Degree-distance fixes for special military operations
- Courses, azimuths, bearings, quadrants, or radials within a radius of a NAVAID



- Fixes/waypoints defined in terms of:
 - Published name
 - Degree-distance from NAVAIDs
 - Latitude/longitude coordinates



Phraseology

“DIRECT (fix/waypoint).” e.g., “DIRECT HEDUD”

“DIRECT TO THE (facility) (radial) (distance) FIX.”

Example: “DIRECT TO THE MAGNOLIA TWO FOUR FIVE RADIAL THREE ZERO MILE FIX”

ALTITUDE STRATUM EXERCISE

Exercise

ALTITUDE STRATUM EXERCISE



Purpose: to practice determining which route to clear aircraft based on altitude stratum

Directions: answer the questions

12

Directions

Record your answers to questions 1 – 7 in the space provided.

Questions

QUESTION 1

UAL35	MCB 1500	28	160	SQS		
A320/I		15				
T420						
66						
		MHZ				

❖ **QUESTION:** Should this aircraft be cleared via victor airway or jet route?

13

Continued on next page

ALTITUDE STRATUM EXERCISE *(Continued)*

Questions (Cont'd)

QUESTION 2

N651CC	EIC	22	210✓	MEI		
C650/I	0256	03				
T420		17				
66		MHZ				

❖ **QUESTION:** Should this aircraft be cleared via victor airway or jet route?

14

QUESTION 3

N8010A	EIC	52	230	MCB		
GLF3/L		00				
T440						
66		MHZ				

❖ **QUESTION:** Should this aircraft be cleared via victor airway or jet route?

15

Continued on next page

ALTITUDE STRATUM EXERCISE *(Continued)*

Questions (Cont'd)

QUESTION 4

N9051N	GLH 1330	48 13	160	MIZZE		
AC80/A T250						
66						
		MHZ				

❖ **QUESTION:** Should this aircraft be cleared via victor airway or jet route?

16

QUESTION 5

N56Q	GLH 0022	48 00	170	MIZZE	KLIT V74 MHZ V11 GCV KMSY/0139	
P28A/A T145						
66						
		MHZ				

❖ **QUESTION:** Is the route that the aircraft is assigned appropriate for the altitude stratum?

17

Continued on next page

ALTITUDE STRATUM EXERCISE (Continued)

Questions (Cont'd)

QUESTION 6

N64AP C500/A T280	MHZ 1911	21 19	160	MLU	KSTF./MHZ V417 MLU KRSN/1942 RDLS	
		DORTS				

❖ **QUESTION:** This aircraft requests climb to FL180, what would the new route clearance be?

18

QUESTION 7

DAL369 MD82/L T420	MEI 1534	44 15	180		KATL./MEI J20 MHZ J4 EIC KDFW RDLS	
		MHZ				

❖ **QUESTION:** Approaching Magnolia VORTAC, DAL369 requests clearance to one six thousand, what would the new route clearance be?

19

ROUTE STRUCTURE TRANSITIONS

Transition Within/ Between Route Structures

JO 7110.65,
par. 4-4-2

- To transition within or between route structures, clear an aircraft by one or more of the following methods, based on VOR, VORTAC, TACAN or MLS NAVAIDs:
 - Vector aircraft to or from:
 - Radials
 - Courses
 - Azimuths of the airway or route assigned
 - Assign a
 - Standard Instrument Departure (SID)
 - Standard Terminal Arrival (STAR)



Phraseology Example

CLIMB/DESCEND ON AIRWAYS

AAL51	MEI 1511	21	160↘ 70	DORTS	KMEI V18 MHZ V417 KMLU
B752/L		15	160 / 12 SE	DINKY	^ V18
T420 G430			X 17 SW ↑		
66			120		
03		MHZ			

“American Fifty-One, cleared to DINKY Intersection, via after Magnolia, Victor Eighteen, maintain one six thousand until one two miles southeast Magnolia cross one seven miles southwest Magnolia VORTAC at or above one two thousand, descend and maintain seven thousand, hold northeast on victor eighteen expect further clearance one five two five.”

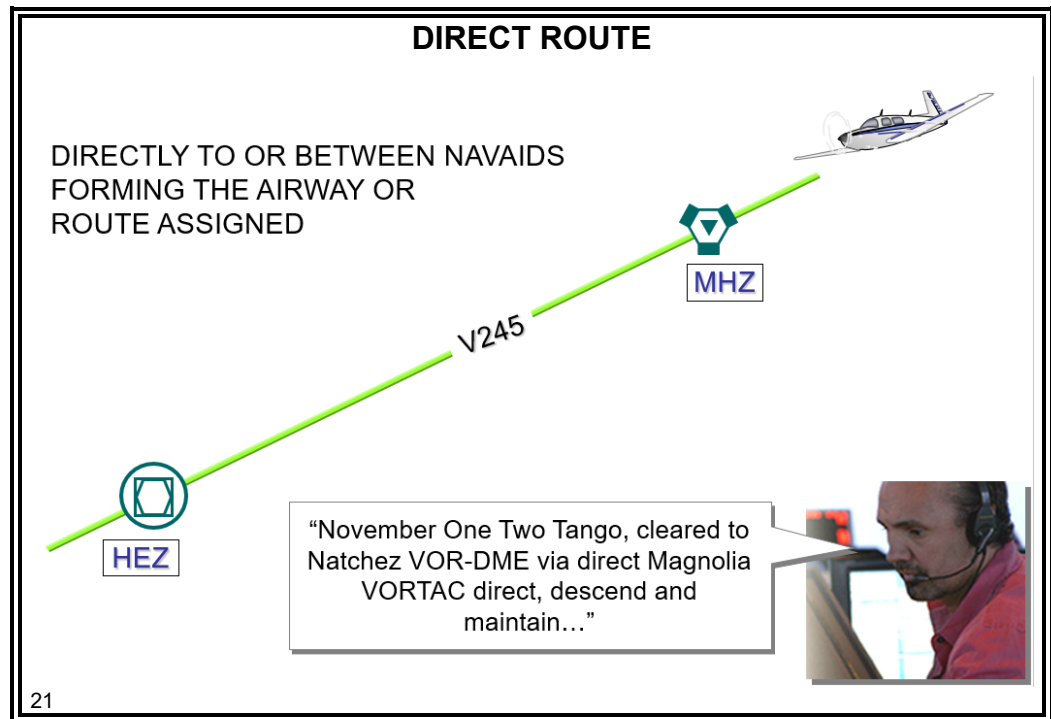
20

- Clear departing or arriving aircraft to climb or descend via:
 - Radials
 - Courses
 - Azimuths of the airway or route assigned

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ROUTE STRUCTURE TRANSITIONS *(Continued)*

**Transition
Within/
Between
Route
Structures
(Cont'd)**
JO 7110.65,
par. 4-4-2



- Clear departing or arriving aircraft directly to or between NAVAIDs forming the airway or route assigned.

Continued on next page

ROUTE STRUCTURE TRANSITIONS *(Continued)*

Transition Within/ Between Route Structures (Cont'd)

JO 7110.65,
par. 4-4-2



Phraseology Example

DESCENT ON AIRWAYS						
AAL51 H/B772/L T475 G475 66 675 05	SQS 0902	11 09	240✓↓70 X35SE ↑ 120	MCB 0921	KMEM J35 KMCB SQS M7LZ V9	6564
		MHZ-271005-				

“American Fifty-One, after Sidon, cleared direct Magnolia Victor Niner McComb, cross three five miles southeast Magnolia VORTAC at or above one two thousand, descend and maintain seven thousand.”

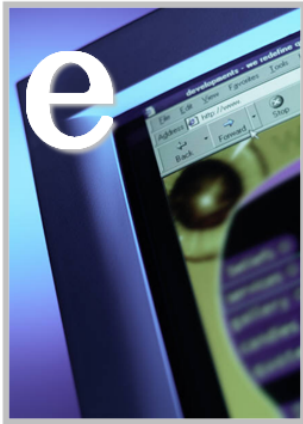
22

- Clear aircraft to climb or descend via:
 - The airway or route on which flight will be conducted
 - Specified radials, courses, or azimuths of NAVAIDs

FIX RADIAL DISTANCE ACTIVITY

Activity

FIX RADIAL DISTANCE ACTIVITY



Purpose: to gain proficiency working with fix radial distances

23

Description

In this activity, you will be presented with information related to the components that comprise a fix radial distance and then will be asked to answer a series of related questions. Feedback will be given immediately.

Directions

Access the IET eLearning menu. Select **Lesson 11 – Route Assignments**. Click on the title to launch the **Fix Radial Distance** activity.

Time Allotted

30 minutes

CLEARANCE AMENDMENTS

Route/Altitude Amendments

JO 7110.65,
par. 4-2-5



Phraseology Example

ROUTE AMENDMENT EXAMPLE 1

N200P	STUEE	21	110✓	ZAMMA	KSAT V18 MHZ V245 IGB	2563
BE65/A	1000	10			KUBS V9 SQS V278	
T160 G160		21				
66		MHZ				
463 02						

“Beechcraft Two Zero Zero Papa, change Magnolia Victor Two Forty-Five Bigbee to read Magnolia Victor Niner Sidon Victor Two Seventy-Eight Bigbee direct Columbus.”

24

- ⦿ Amend route of flight in a previously issued clearance by one of the following methods:
 - State which portion of the route is being amended and then state the amendment



Phraseology

“CHANGE (portion of route) TO READ (new portion of route).”

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CLEARANCE AMENDMENTS *(Continued)*

Route/Altitude Amendments (Cont'd)

JO 7110.65,
par. 4-2-5



Phraseology Example

ROUTE AMENDMENT EXAMPLE 2

N200P	HLI	11	110✓	MHZ	KSTL / HLI V535 SQS V9- MHZ V11 KGCV V557	2571
BE65/A		07				
T160 G160		11				
66		SQS				
462 05						

“Beechcraft Two Zero Zero Papa, cleared via after Sidon Victor Five Fifty-Seven Magnolia, rest of route unchanged.”

25

NOTE: If “rest of route unchanged” is left out, the pilot may be confused as to what routing to fly after MHZ or the pilot may mistakenly assume that the clearance limit is MHZ.

- State the amendment to the route and then state that the rest of the route is unchanged



Phraseology

“(Amendment to route), REST OF ROUTE UNCHANGED.”

Continued on next page

CLEARANCE AMENDMENTS *(Continued)*

Route/Altitude Amendments (Cont'd)

JO 7110.65,
par. 4-2-5



Phraseology Example

ROUTE AMENDMENT EXAMPLE 3						
SWA632	HEZ	11	110✓	SQS	KMSY HEZ V245 MHZ V555	1362
B733/A	1100	11			SQS KGWO	
T450 G435		11				
66						
211 01		MHZ				

“Southwest Six Thirty-Two, cleared direct Magnolia VORTAC.”

26

- Issue a clearance “direct” to a point on the previously issued route



Phraseology

“CLEARED DIRECT (fix).”

NOTE: Clearances authorizing “direct” to a point on a previously issued route do **not** require the phrase, “rest of route unchanged.” However, it **must** be understood where the previously cleared route is resumed. When necessary, “rest of route unchanged” may be used to clarify routing.

Continued on next page

CLEARANCE AMENDMENTS *(Continued)*

Route/Altitude Amendments (Cont'd)

JO 7110.65,
par. 4-2-5



Phraseology Example

ROUTE AMENDMENT EXAMPLE 4

N14AM	KGWO	21	80	STUEE	KGWO SQS V9 MHZ V18 EIC	1364
BE35/A	P1600	16		DORTS	KSHV	
T180					V417 MLU V18	
66						
521	02	+21	MHZ			

Bonanza One Four Alpha Mike has been cleared to the Shreveport (SHV) Airport via Sidon Victor Niner Magnolia Victor Eighteen Belcher (EIC) Direct Shreveport Airport Climb and Maintain Eight Thousand. After takeoff, the aircraft is rerouted via after Magnolia Victor Four Seventeen Monroe Victor Eighteen Belcher.

27

- Issue the entire route by stating the amendment

The Controller can issue **any** one of the following clearances:



Phraseology

- “Bonanza One Four Alpha Mike **Change** Victor Eighteen Belcher **To Read** Victor Four Seventeen Monroe Victor Eighteen Belcher.”
- “Bonanza One Four Alpha Mike cleared via after Magnolia Victor Four Seventeen Monroe Victor Eighteen Belcher, **Rest of Route Unchanged.**”
- “Bonanza One Four Alpha Mike Cleared via after Magnolia Victor Four Seventeen Monroe Victor Eighteen Belcher **Direct Shreveport Airport.**”

Continued on next page

CLEARANCE AMENDMENTS (Continued)

Route/Altitude Amendments (Cont'd)

JO 7110.65,
par. 4-2-5



Phraseology Example

ROUTE/ALTITUDE AMENDMENT ORIGINAL CLEARANCE						
N27T			↑	↑ 120	GLH	KGWO SQS V278 GLH
C421/A				X6NW SQS		V94 KMLU /0057
T180				↓ 90		
66		(2019)				
481	01	KGWO P2020		↑ 120	120	D-A

“Cessna Two Seven Tango, cleared to Monroe Airport via direct Sidon Victor Two Seventy Eight Greenville Victor Ninety Four. Cross six miles northwest Sidon VORTAC at or below nine thousand. Climb and maintain one two thousand.”

28



Phraseology Example

ROUTE/ALTITUDE AMENDMENT (CONT'D) AMENDED ROUTE AND ALTITUDE RESTRICTION						
N27T			↑	↑ 120	GLH	KGWO SQS V278 GLH V94
C421/A				X6NW SQS		KMLU /0057
T180				↓ 90 70		
66		(2019)				
481	01	KGWO P2020		↑ 120	120	D-A

“Cessna Two Seven Tango, cleared to Greenville Airport via direct Sidon Victor Two Seventy-Eight. Cross six miles northwest Sidon VORTAC at or below seven thousand. Climb and maintain one two thousand.”

29

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

Continued on next page

CLEARANCE AMENDMENTS *(Continued)*

Route/Altitude Amendments (Cont'd)

JO 7110.65,
par. 4-2-5

NOTE: Restating previously issued altitude to “maintain” is an amended clearance. If altitude to “maintain” is changed or restated, whether prior to departure or while airborne, and if previously issued altitude restrictions are omitted, altitude restrictions are canceled, including SID/STAR/ATC altitude restrictions, if any.

Example: A Greenwood Departure is cleared to cross one seven miles southwest Sidon VORTAC at or below five thousand, cross one seven miles northwest Magnolia VORTAC at or above seven thousand, climb and maintain one zero thousand. Shortly after takeoff the aircraft request a final altitude of eight thousand. Because the altitude restriction remains in effect, the controller issues an amended altitude clearance as follows:

“Amend Altitude. Cross one seven miles southwest Sidon VORTAC at or below five thousand, cross one seven miles northwest Magnolia VORTAC at or above seven thousand, climb and maintain eight thousand.”

Continued on next page

CLEARANCE AMENDMENTS *(Continued)*

Knowledge Check

KNOWLEDGE CHECK

❖ **QUESTION:** What are the four ways to amend a route of flight?

30

KNOWLEDGE CHECK

N23GP			↑120	MHZ	KGWO SQS V9 MCB KBTR	
LJ24/I			X17SE SQS		MHZ V557	
T450			↓70			
66			X17NW MHZ			
		1733 /1733	↑90			D-A
		KGWO P1730		130		

❖ **QUESTION:** N23GP was cleared as filed. Later, the aircraft was rerouted via SQS V9 MHZ V557 MCB KBTR with the same restrictions and altitude. How should the clearance be amended?

- A. Amend route and say, "Altitude and restrictions remain unchanged."
- B. Amend route only.
- C. Amend route and restate applicable altitude restrictions.

31

IN CONCLUSION

Lesson Review

LESSON REVIEW

The following topics were covered in this lesson:

- Clearance and route assignment procedures for IFR aircraft
- Phraseology for issuing selected clearances



32

End-of-Lesson Test

END-OF-LESSON TEST

Route Assignments



33