Federal Aviation Administration

En Route ERAM Ghost Pilot (GP) Training

Lesson 5: Specialized Target Simulation Tasks

Course FAA55149002

Version: V.2019-05

INSTRUCTOR LESSON PLAN

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LESSON PLAN DATA SHEET

Section	Description
Course Name	En Route ERAM Ghost Pilot (GP)
Course Number	FAA55149002
Lesson Title	Specialized Target Simulation Tasks
Duration	1 Hour 30 minutes
Date Revised	May 2019
Version	V.2019-05
Software Compatibility	Microsoft Word, Power Point
Reference(s)	• TI 6110.106, ERAM Ghost Pilot Quick Reference Card • TI 6110.154, ERAM ARTCC System Support Manual: Simulation User's Guide • ATPilot Situational Display Data (SDD) User Manual
Handout(s)	Ghost Pilot Course Quick Reference Card
Exercise(s)/ Activity(s)	Part Task Scenario 5
Assessments	End-of-course Knowledge and Performance Tests
Materials and Equipment	Projector
Other Pertinent Information	None

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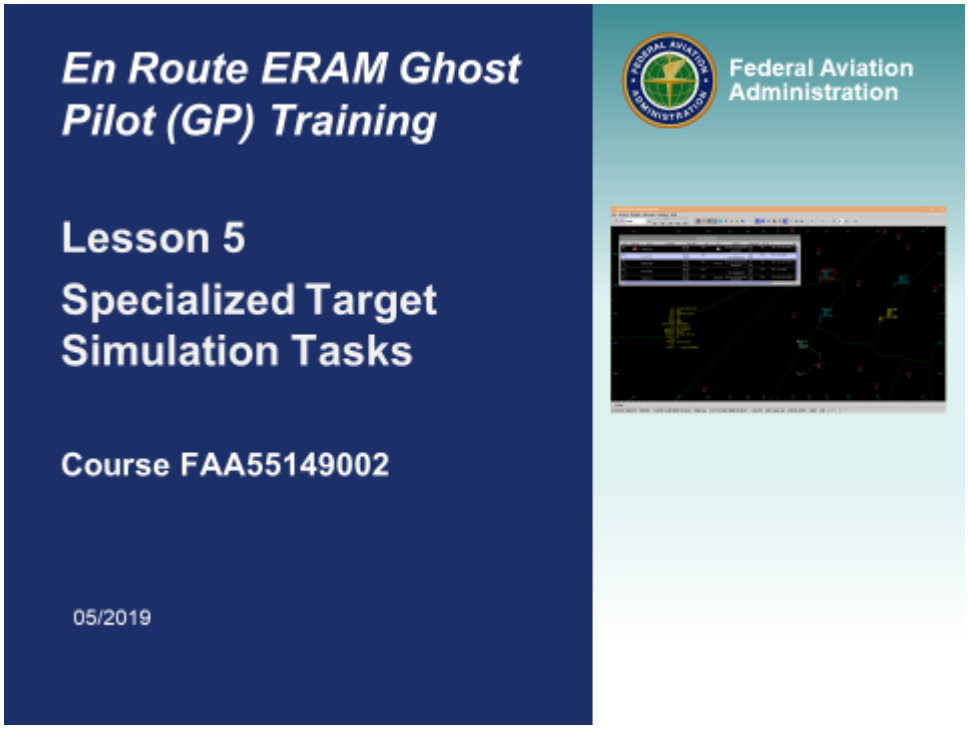
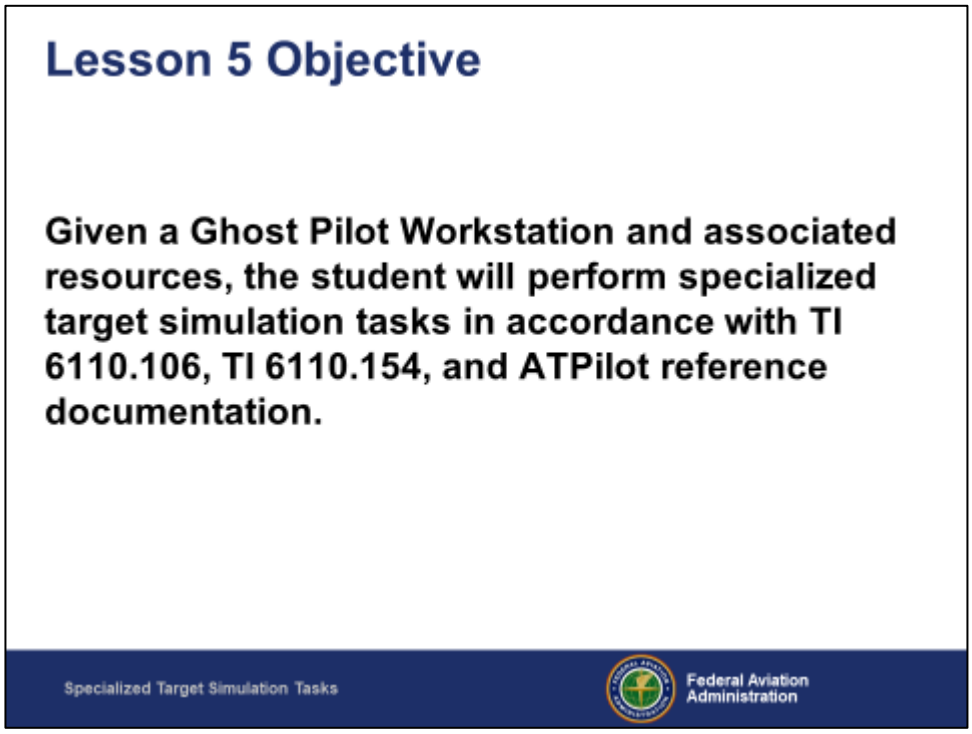
Slide - 1.



Instructor Notes

Gain attention and start the lesson.

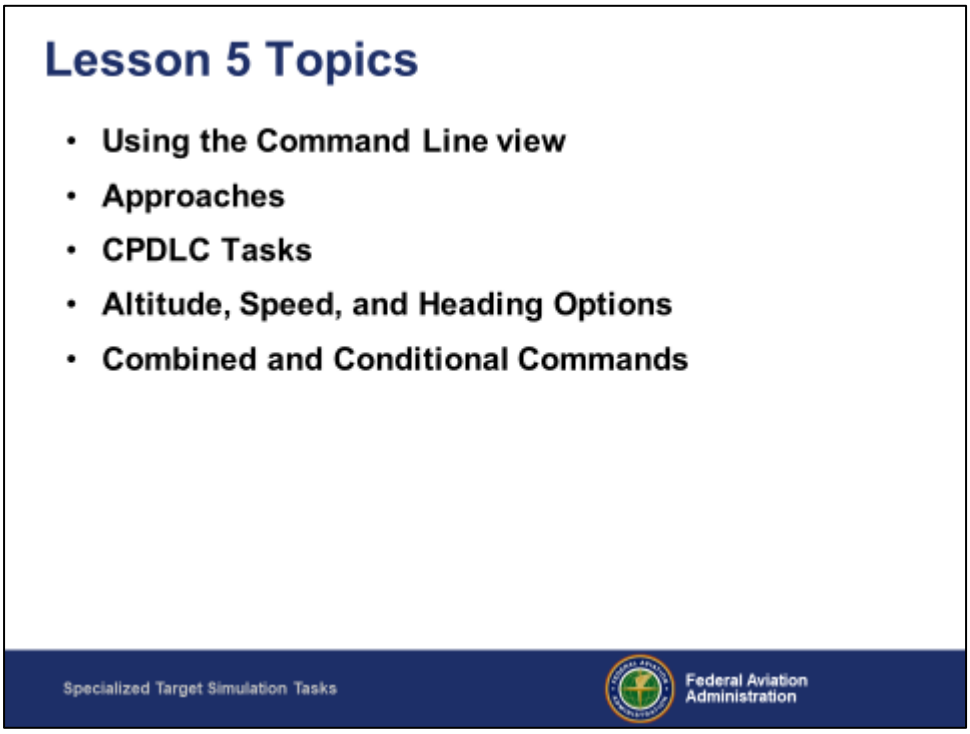
Slide - 2.



Instructor Notes

Review Lesson 5 objective.

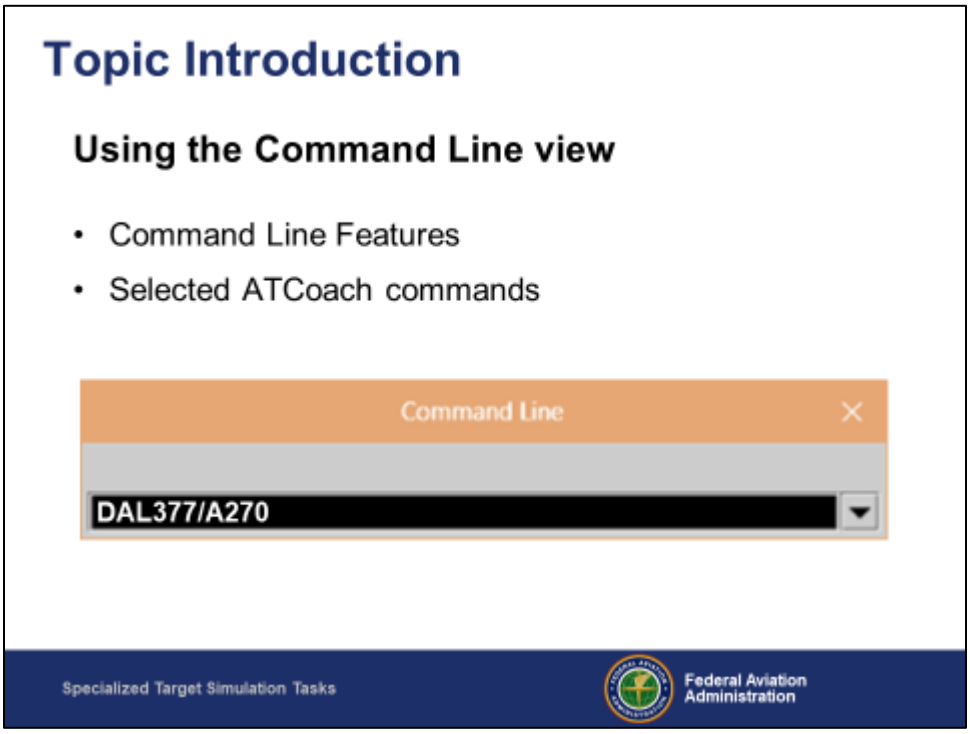
Slide - 3.



Instructor Notes

Review Lesson 5 topics.

Slide - 4.



Student Content

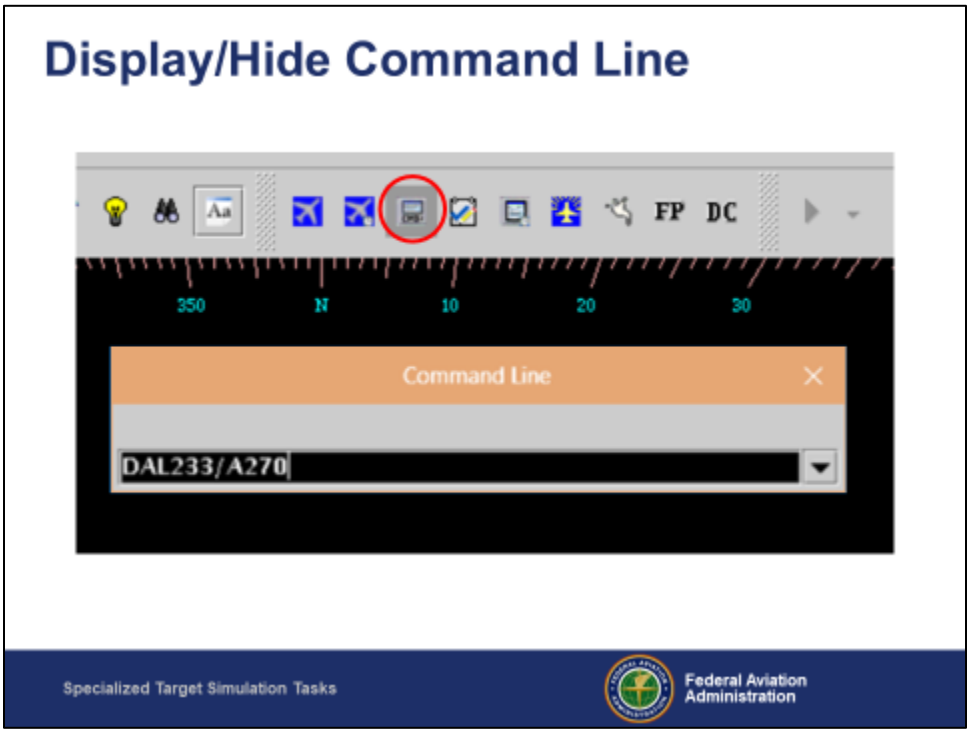
Some Ghost Pilots prefer to bypass the ATPilot Graphical User Interface (GUI) and manually enter the required ATCoach command instead. There are also certain ATCoach commands that do not have a GUI option.

The Command Line view is used to make these entries.

In this section, we will:

- Describe the Command Line view features.
- Introduce selected ATCoach commands.

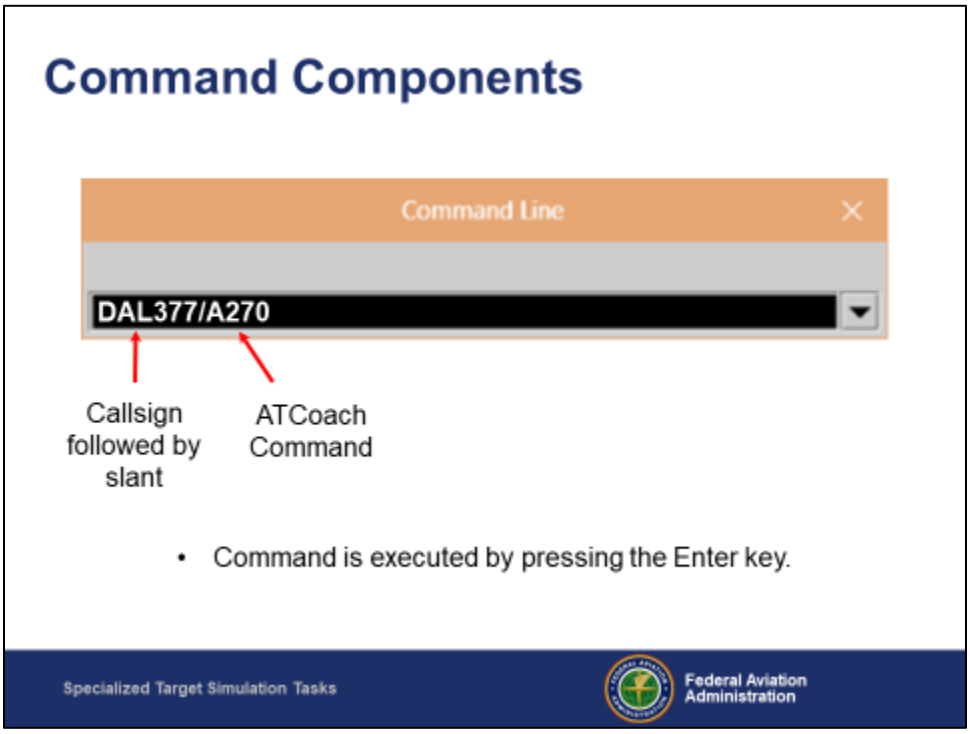
Slide - 5.



Student Content

Use the Command Line icon on the Views toolbar to display or hide the Command Line view.

Slide - 6.



Student Content

Each command requires the target callsign, a forward slant, and the desired ATCoach command. The forward slant separates the callsign from the command.

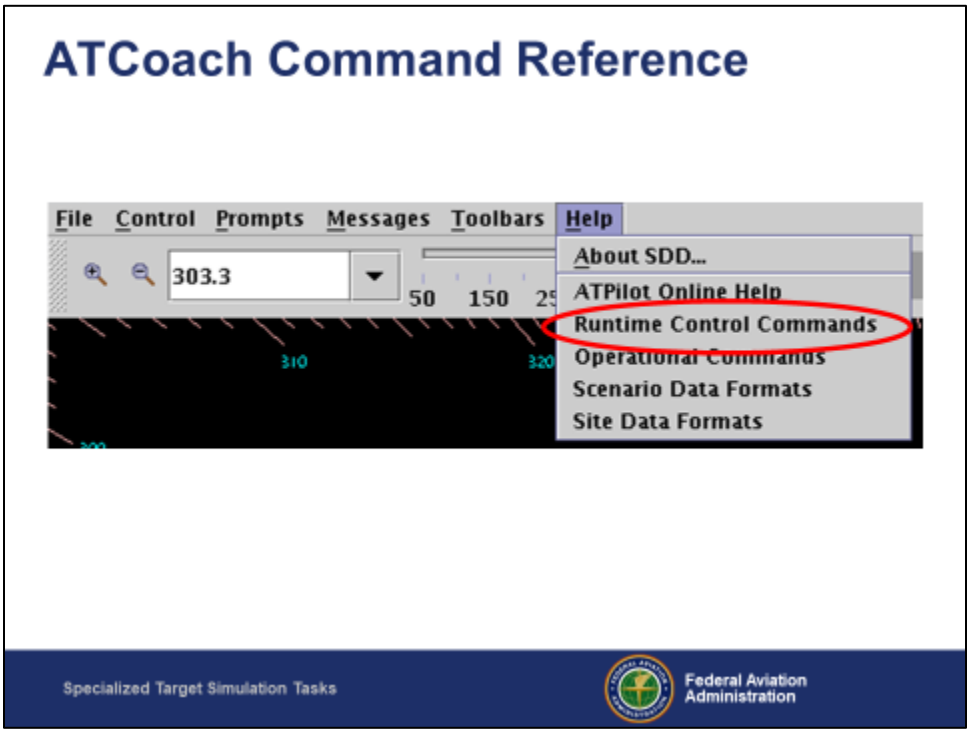
- The callsign and forward slant can quickly be added by selecting the desired target (i.e., click on the target).

In this example, DAL377 is being assigned a new altitude of FL270.

The command is executed by pressing the Enter key.

A reject message will appear if the command syntax is incorrect or some other condition prevents the command from being executed.

Slide - 7.



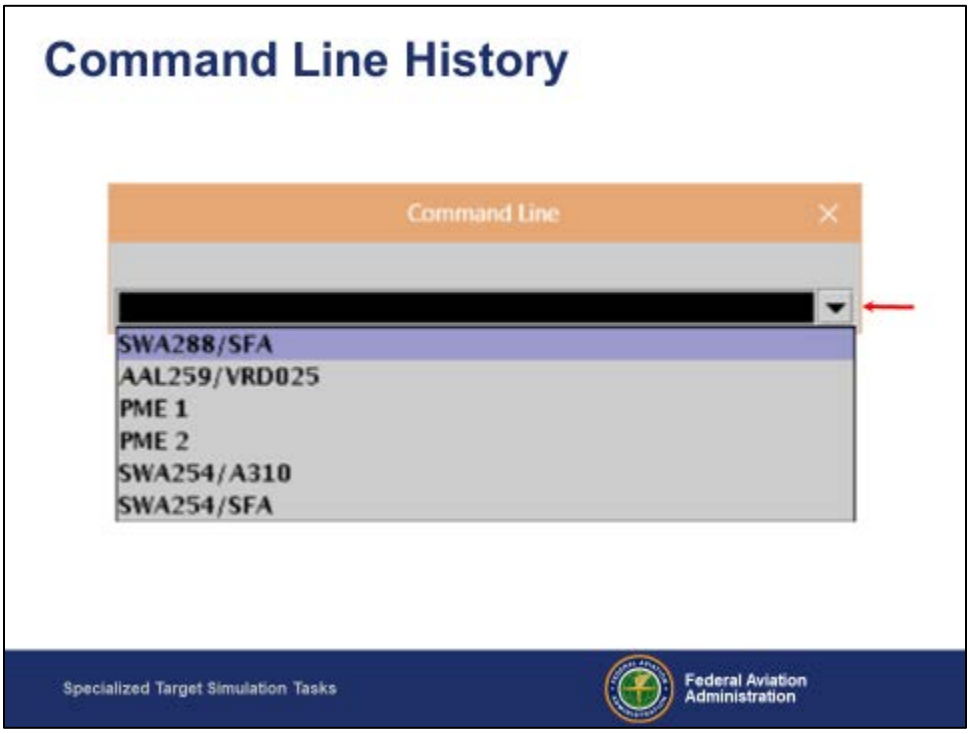
Student Content

ATCoach command documentation is available under the Help menu.

ATCoach target control commands (e.g., altitude, heading, and speed) are described in the Runtime Control Commands manual. This is the primary resource for Ghost Pilots that want to research ATCoach commands.

The remaining documentation is more specialized and much more useful to scenario developers than to Ghost Pilots.

Slide - 8.



Student Content

Click on the pull-down list button to display a list of ATCoach commands entered during the scenario. This includes typed commands, as well as the commands generated by ATPilot as a result of a GUI interaction, for example a click on the Altitude Change dialog.

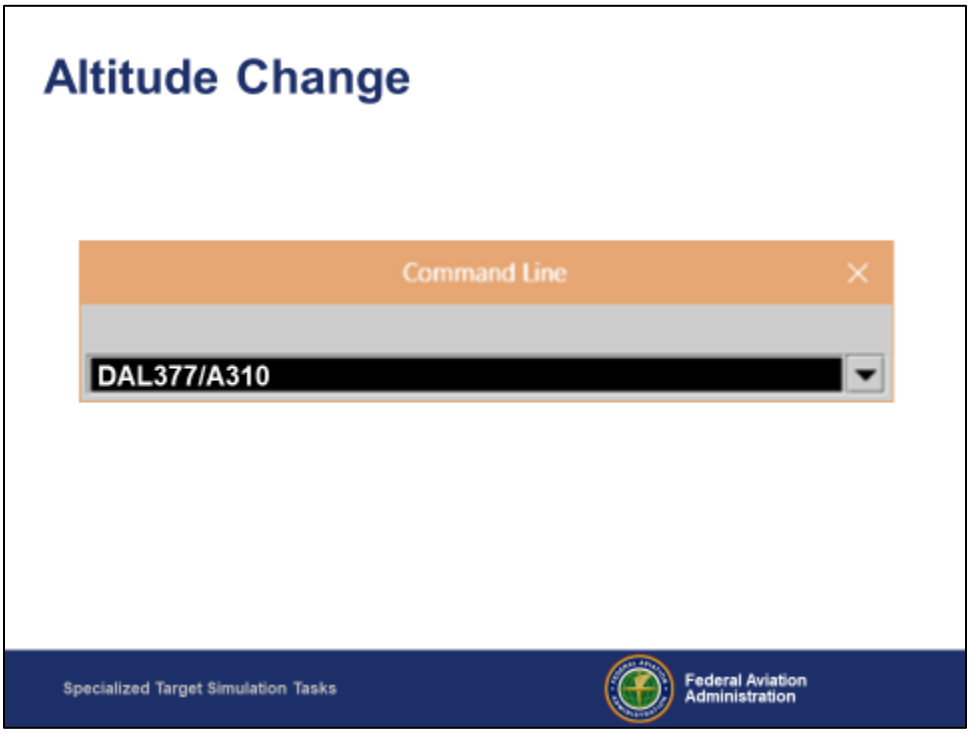
- If a callsign is in the command line, the Command History is only for that aircraft.
- If no callsign is in the command line, the Command History is for all aircraft.

Click on a command to move that command to the input area. If desired, the command can be edited, for example, to replace the callsign.

Most commands will be entirely visible within the Command Line window, but for long command strings, you may want to re-size the window by dragging any edge or corner.

Press the Enter key to execute the command.

Slide - 9.



Student Content

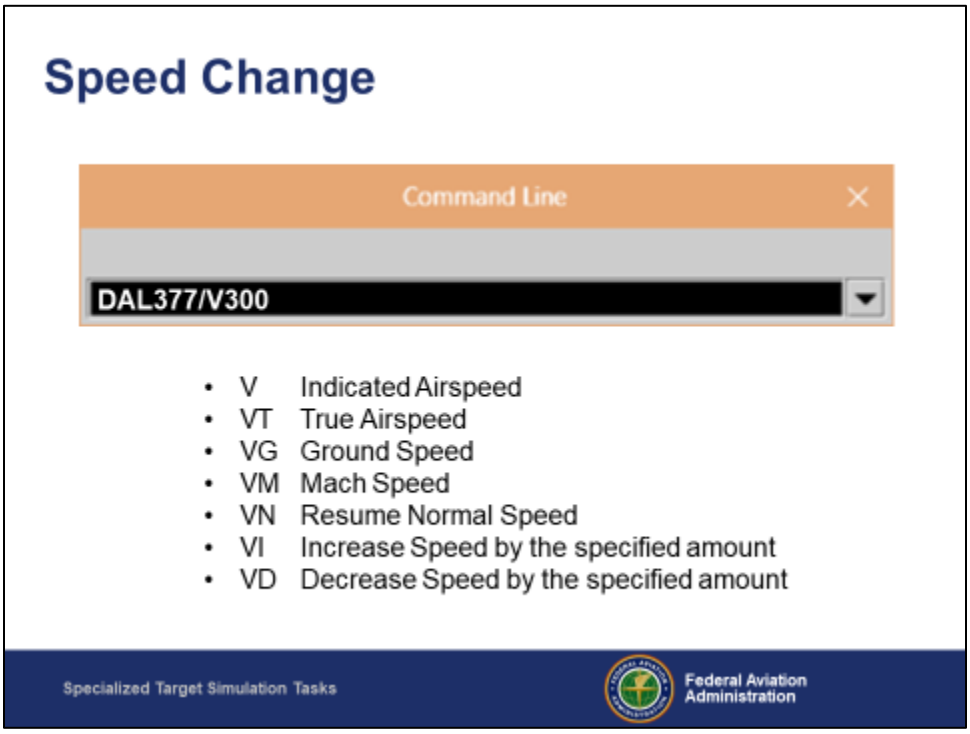
The Altitude Change command (A) causes the target to climb or descend to the altitude specified in the command.

The syntax is the letter A followed immediately by a three digit altitude. For altitude below 10,000 ft. leading zeros are required.

- In this example, the target will climb or descend to FL310.

Other possible parameters are covered later in this lesson.

Slide - 10.



Student Content

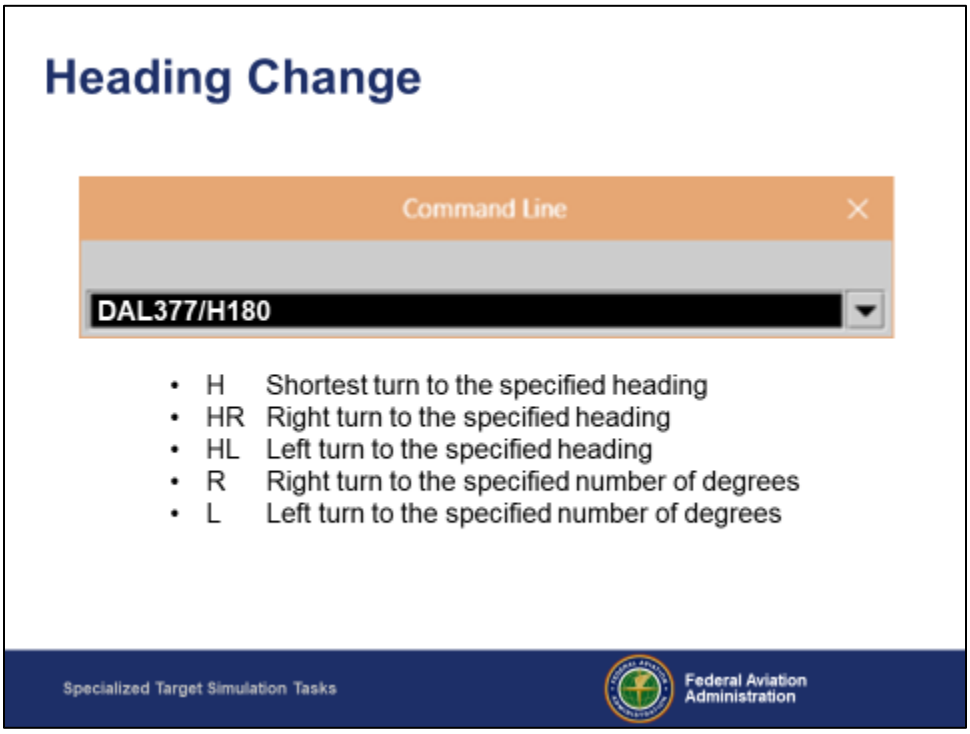
There are a number of commands available to change a target's speed. These include:

- V Indicated Airspeed
- VT True Airspeed
- VG Ground Speed
- VM Mach Speed
- VN Resume Normal Speed
- VI Increase Speed by the specified amount
- VD Decrease Speed by the specified amount

The syntax is the desired command immediately followed by three digits. For MACH speeds, the acceptable values are 0.00 through 9.99. Leading zeros are required.

- In this example, the target will change it's indicated speed to 300 knots.

Slide - 11.



Student Content

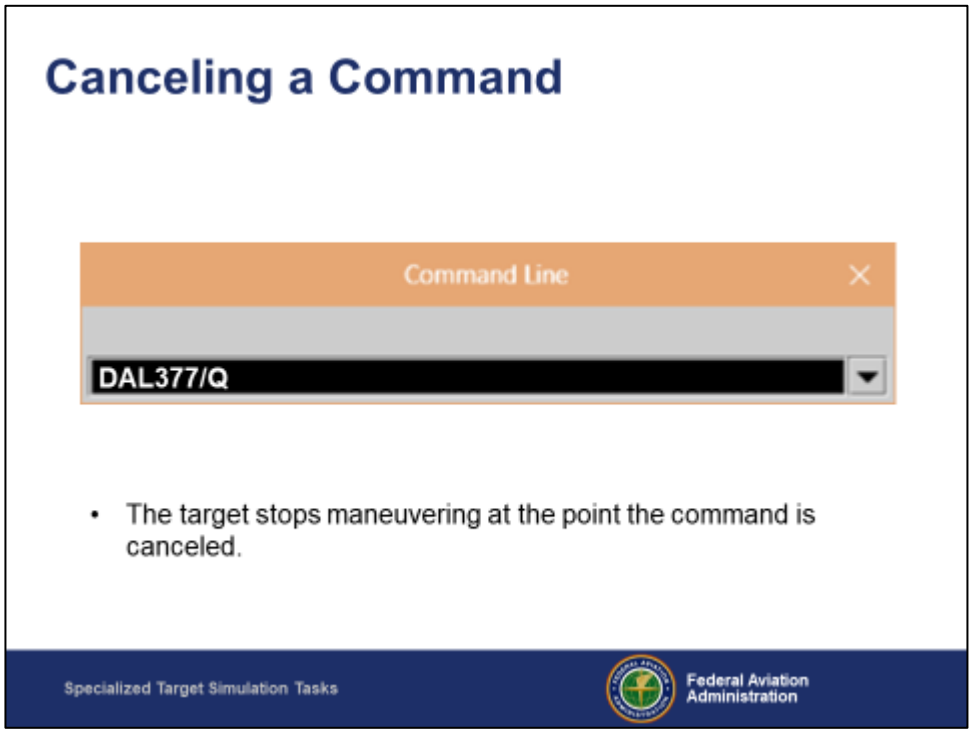
There are a number of commands available to change a target's heading. These include:

- H Shortest turn to the specified heading
- HR Right turn to the specified heading
- HL Left turn to the specified heading
- R Right turn to the specified number of degrees
- L Left turn to the specified number of degrees

The syntax is the desired command immediately followed by three digits. Leading zeros are required.

- In this example, the target will make the shortest turn to a heading of 180.

Slide - 12.

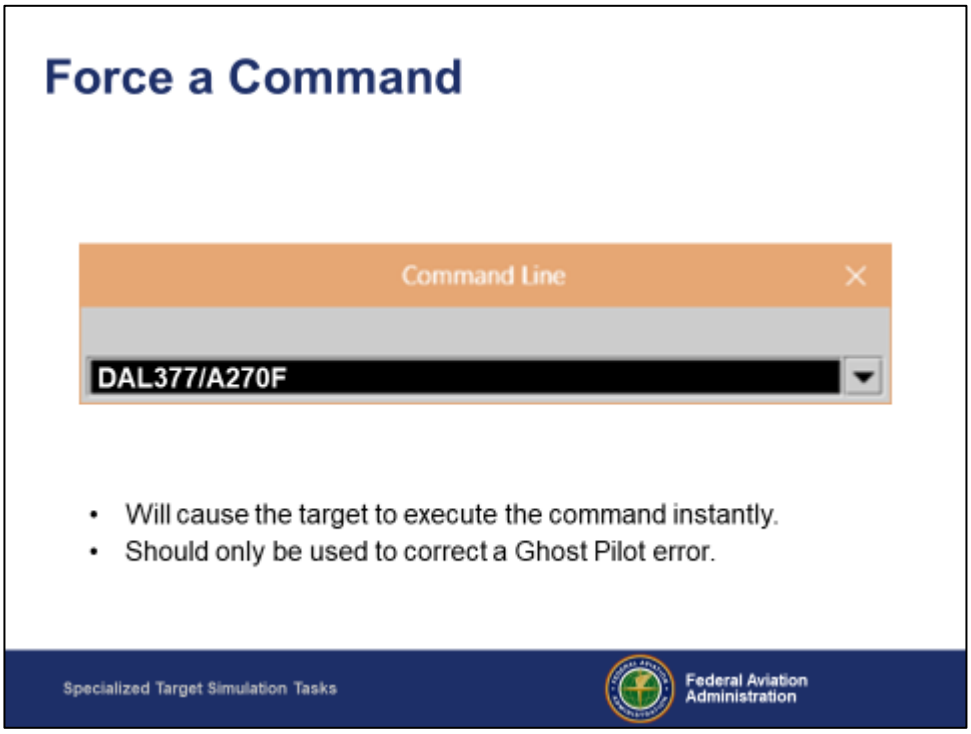


Student Content

The command /Q stops all current target maneuvers immediately. The target will remain at the current altitude, speed, and heading when the Cancel command is entered.

- For example, if a target climbing to FL310 is at FL297 when the command is entered, the target will remain level at FL297.

Slide - 13.



Student Content

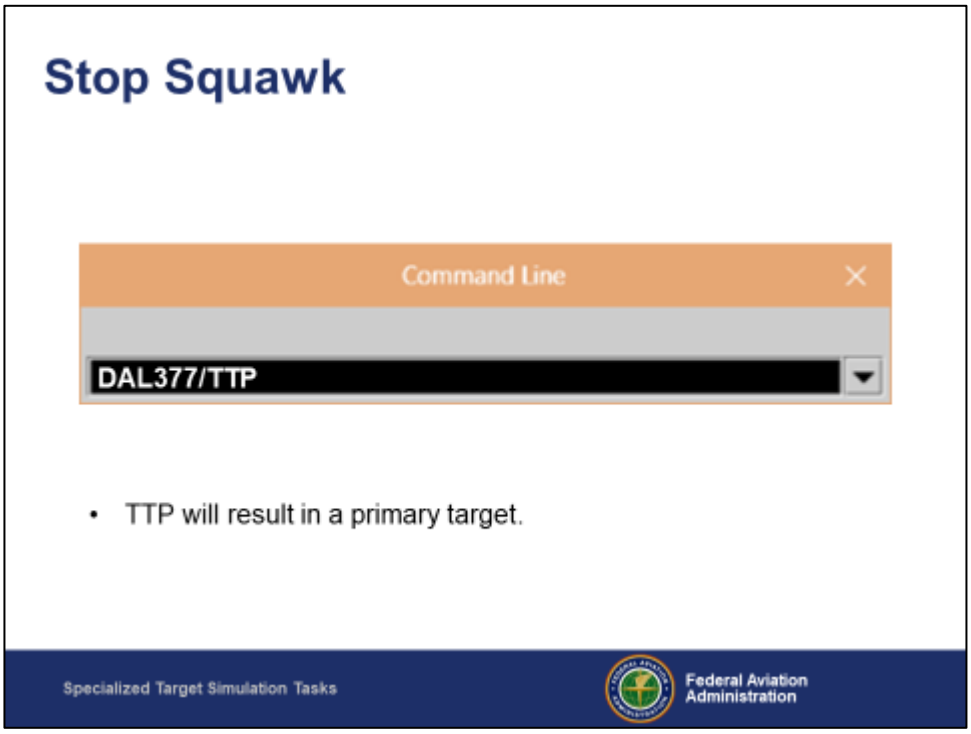
The Force (F) command, appended to any other ATCoach command, will cause the target to perform the maneuver immediately. Note that there is no space between the ATCoach command and the F.

- For example, if DAL377 is at FL210 and the command DAL377/A270F is entered, the target will immediately be at FL270.

The Force command should only be used to correct a Ghost Pilot error.

- For example, if you change the heading of the wrong target, you can use the Force command to return the target to the correct heading immediately.

Slide - 14.



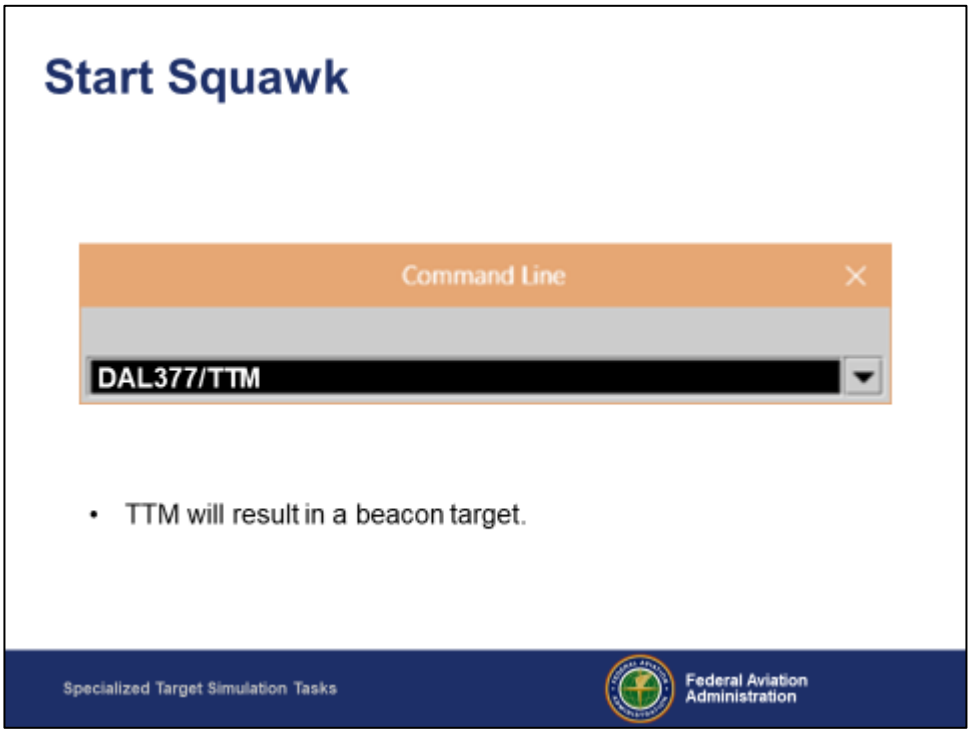
Student Content

The command TTP (Target Type Primary) results in a target with a Mode A transponder that is disabled. Only primary target radar data is then sent to ERAM, meaning a primary target is displayed at the R-position.

A similar result can be accomplished by disabling a target's Mode A transponder using the SSR Mode/Code dialog.

If the TTP command is used to change the target radar type, entries made in the SSR Mode/Code dialog will have no effect since the target is not broadcasting.

Slide - 15.



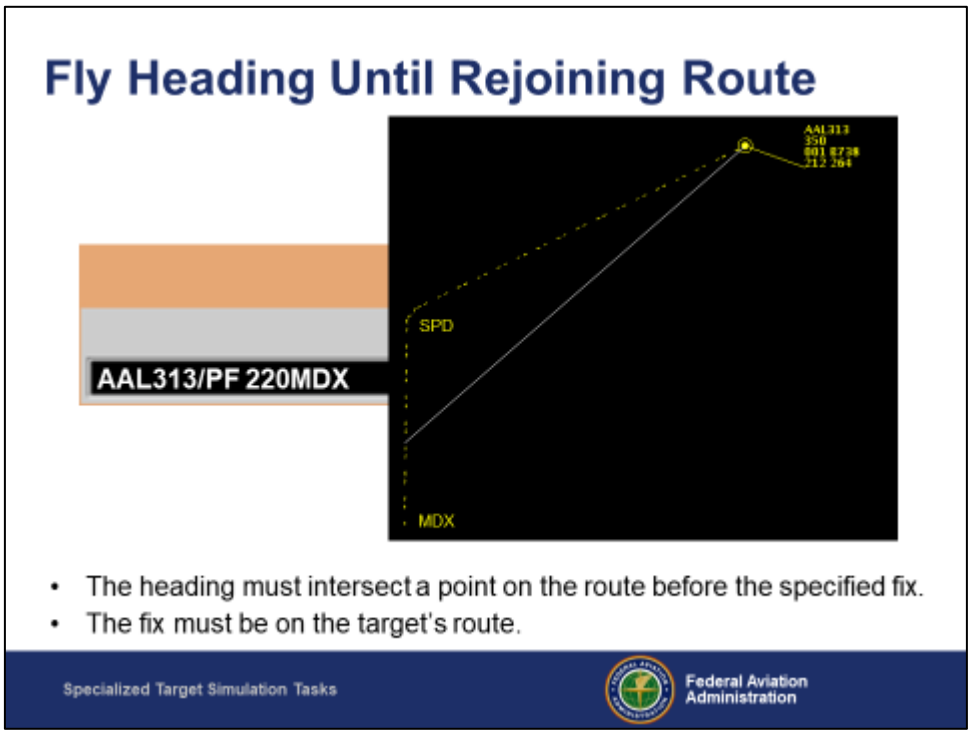
Student Content

The TTM (Target Type Merged) command re-enables the Mode A transponder for a target, if so equipped. If the transponder is enabled, simulated beacon radar data will be sent to ERAM and a beacon target will be displayed at the R-position.

Any entries made in the SSR Mode/Code dialog will have an effect since the target is defined as being equipped with a Mode A transponder.

Use the SSR Mode/Code dialog to change the beacon code being squawked by the target.

Slide - 16.



Student Content

The PF (Proceed to Fix) command can be modified to cause a target to fly a heading until intersecting the current route, and then proceed on the route (victor airway, jet route, etc.).

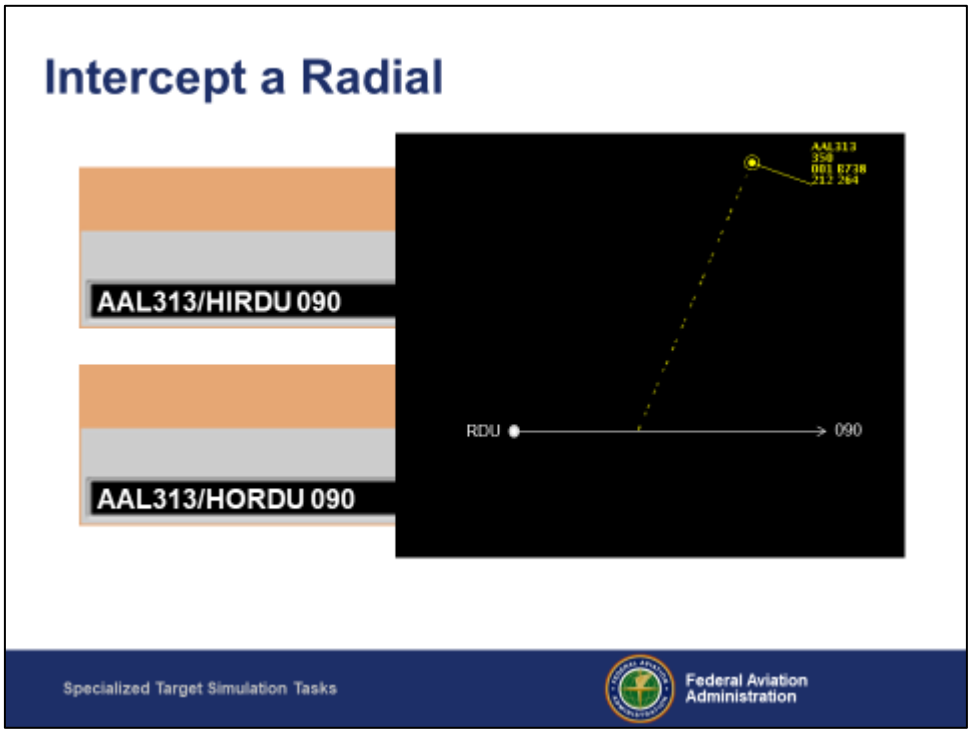
The command syntax is PF, a space, the assigned heading followed immediately by the desired fix (i.e. no space between the heading and fix).

- In this example, AAL313 will fly a heading of 220 until intercepting the current target route somewhere upstream of MDX, then turn towards MDX and continue on the current route.
- Example clearance: “American three thirteen, fly heading two two zero until joining J123, rest of route unchanged.”

Two requirements are necessary for this command to work:

- The fix must be on the current target route.
- The heading must intersect a point on the current route prior to the specified fix.

Slide - 17.



Student Content

The HI (Heading Inbound) and HO (Heading Outbound) commands cause the target to fly the current heading until intercepting a radial, then proceed on the radial heading.

The command syntax for an inbound radial is HI followed immediately by the desired fix, a space, and then the desired radial.

- In the top example, AAL313 will fly its current heading until intercepting the RDU 090 radial. It will then turn towards RDU and proceed on that heading.

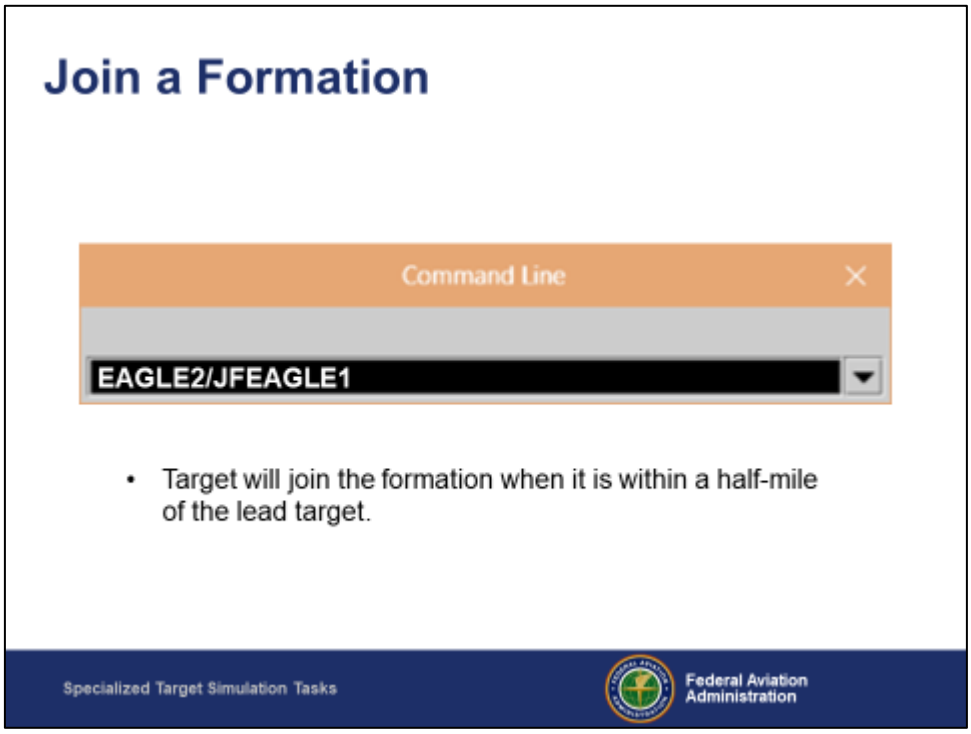
The command syntax for an outbound radial is HO followed immediately by the desired fix, a space, and then the desired radial.

- In the bottom example, AAL313 will fly its current heading until intercepting the RDU 090 radial. It will then turn away from RDU and proceed on that heading.

Two considerations:

- The current heading must intersect the specified radial for the command to be accepted.
- The command will erase the current target route.

Slide - 18.



Student Content

The JF (Join Formation) command causes a target to join a formation leader and display as a single flight at the R-position.

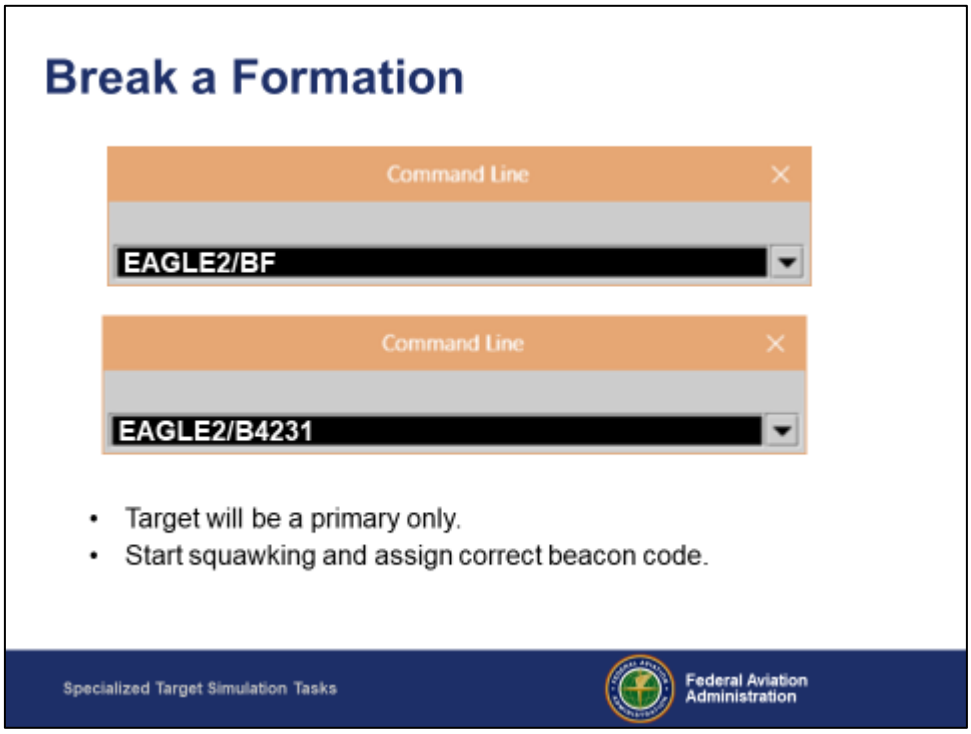
The target will join the formation when it is a half-mile from the leader.

A target above or below the formation leader will change altitude to match the leader's altitude.

When the target joins the formation, the system will automatically convert the target's type to primary.

The command syntax is JF immediately followed by the flight leader callsign (i.e., no space).

Slide - 19.



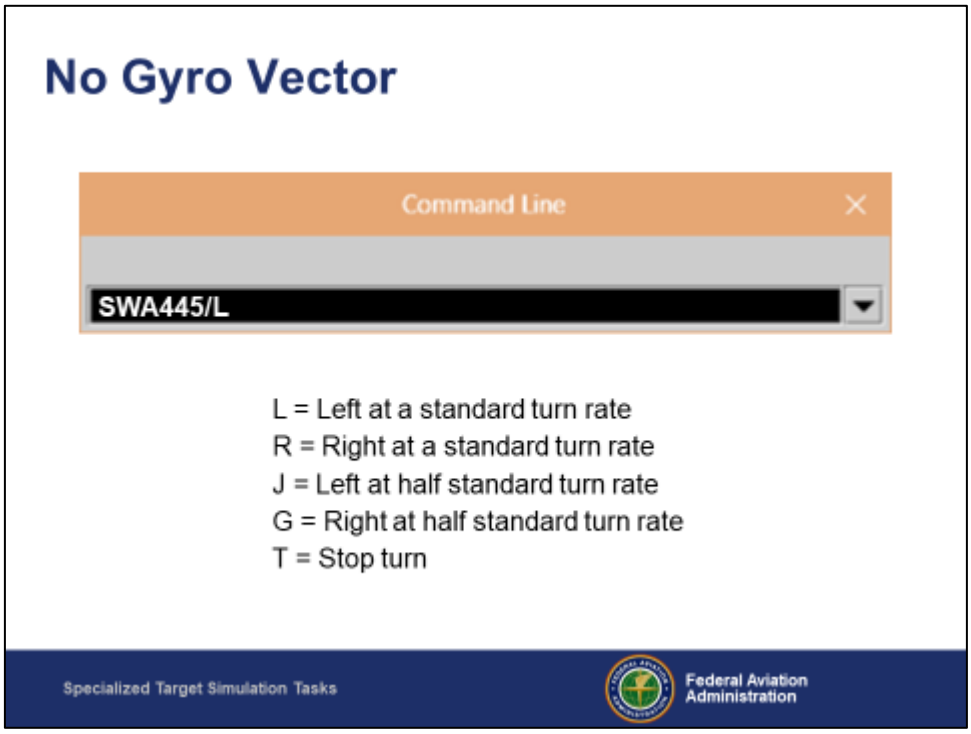
Student Content

The BF (Break Formation) command is used to cause a target to break from a formation. The command syntax is BF.

A primary target will be displayed at the R-position.

- Use the TTM command to enable the Mode A transponder of the target.
- Use the SSR Mode/Code dialog to assign a beacon code to the target using the code assigned by the controller.
- The command line can also be used to assign a beacon code. Syntax: <ACID>/Bdddd

Slide - 20.



Student Content

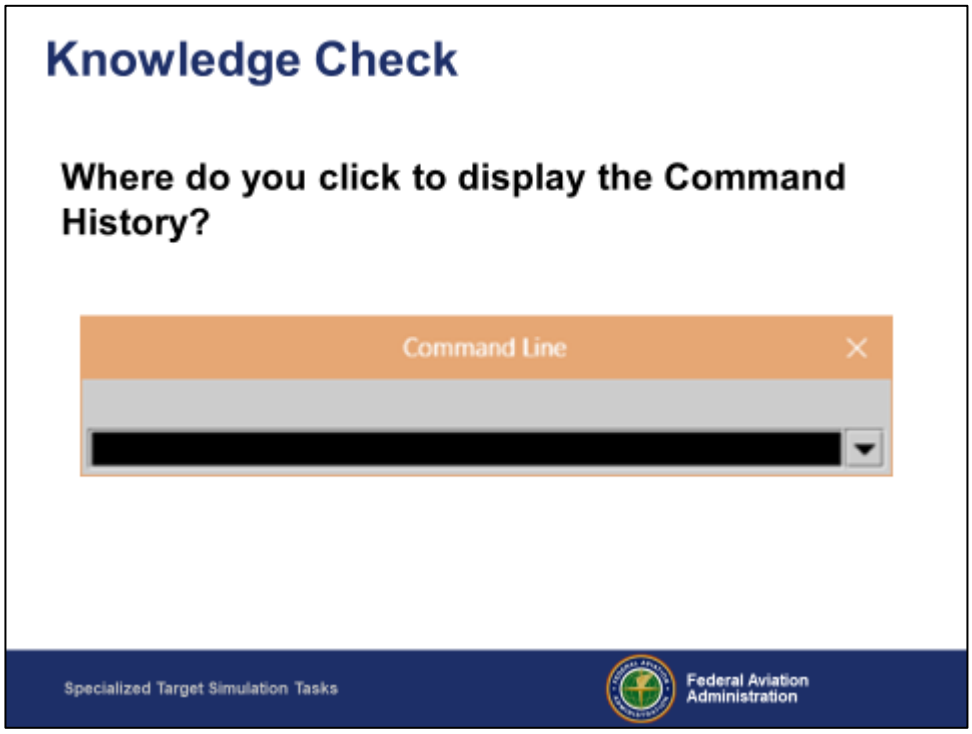
There are four commands that cause a target to begin a turn in the specified direction and rate and continue turning until another command is entered (i.e., No Gyro Vector). The commands are:

- L Left at a standard turn rate
- R Right at a standard turn rate
- J Left at half standard turn rate
- G Right at half standard turn rate
- T Stop turn

When the T command is entered, the target will stop turning and proceed on whatever heading it was on when the command is entered.

These are the same ATCoach commands that are injected if the Orbit Tab in the Hold dialog is used.

Slide - 21.

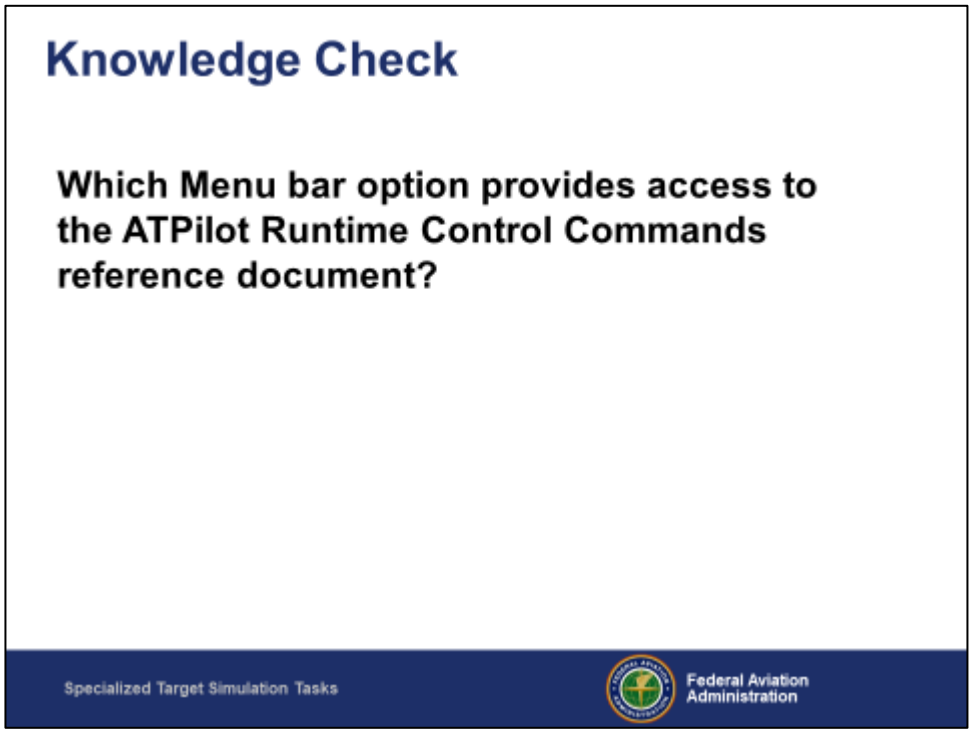


Instructor Notes

For all Knowledge Check questions, once a student has answered, click once to reveal the answer.

Answer: The pull-down list button.

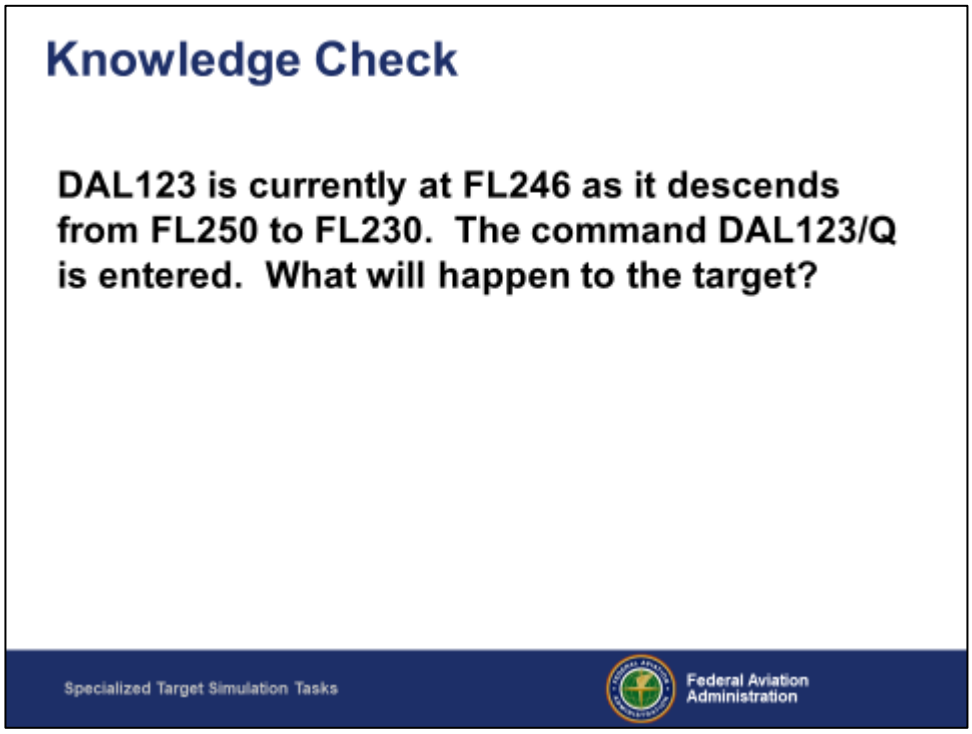
Slide - 22.



Instructor Notes

Answer: Help

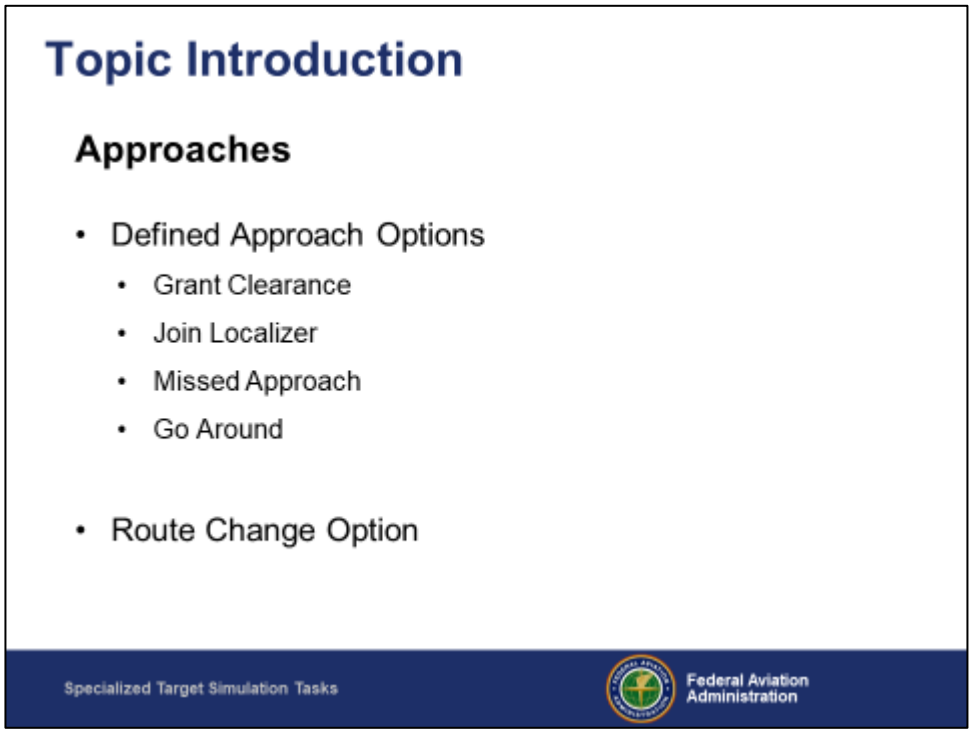
Slide - 23.



Instructor Notes

Answer: The target will stop descending and remain at FL246.

Slide - 24.



Student Content

Scenario developers can create flight paths to simulate approaches. The paths include a set of fixes with altitude/speed changes at the appropriate fixes. There are two methods for doing so:

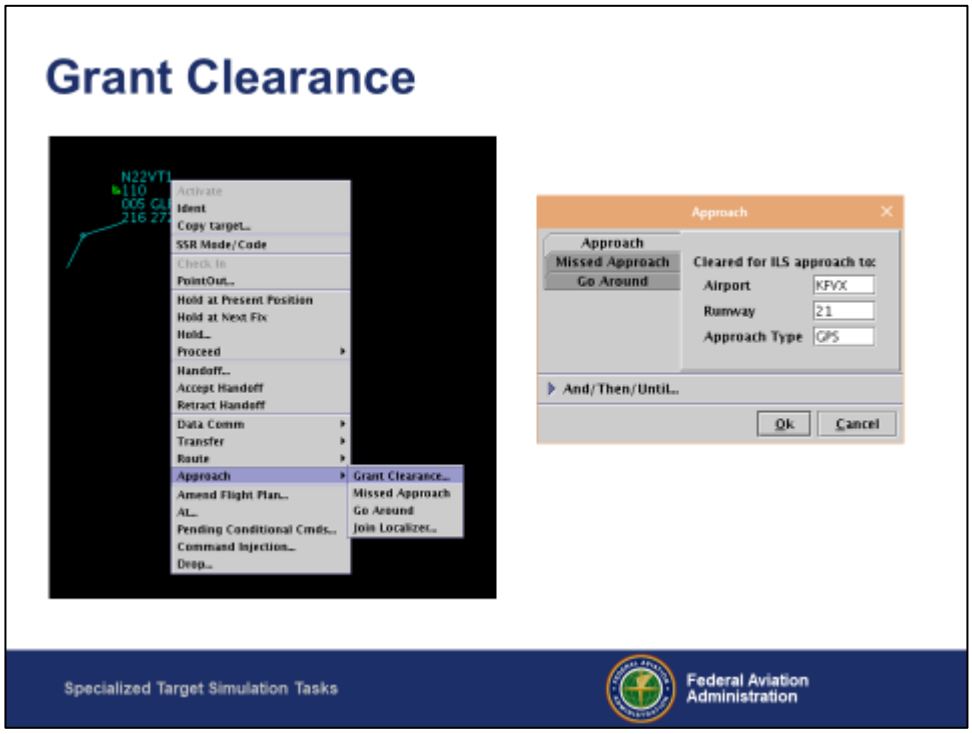
- Defined Approach
    - Scenario developers can use the Runway Definition (for ILS approaches) or Non-ILS Approaches functions in SGET. If this method is used, Ghost Pilots use the four ATPilot approach commands covered in this section to execute the approach.
- Route Change
    - Scenario developers can use the Route function in SGET. If this method is used, Ghost Pilots use the Route Edit dialog to execute the approach.

In either case, the scenario development team will need to provide Ghost Pilots the necessary information about the available approaches or route names used at the facility.

Instructor Notes

Teach Method A, Method B, or both based upon how the facility has defined their approaches.

Slide - 25.



Student Content

The **Approach** option on the Target Control menu opens a sub-menu with four approach functions.

Clicking on the **Grant Clearance** option opens the Approach dialog used for executing approaches. The dialog has three tabs that correspond to the top three options in the sub-menu:

- Approach
- Missed Approach
- Go Around

The **Approach** tab is used to execute a defined approach. To do so:

1. Select the **Approach** tab.
2. Enter the Airport Identifier (the K is required).
3. Enter the runway number.

4. Enter the approach type.
    - The default approach type is ILS.
    - Other approach types are GPS, VOR, DME, NDB, TACAN, ADF, and LDA.
    - The scenario development team must provide the specific approaches and types available.
5. Click **Ok**.

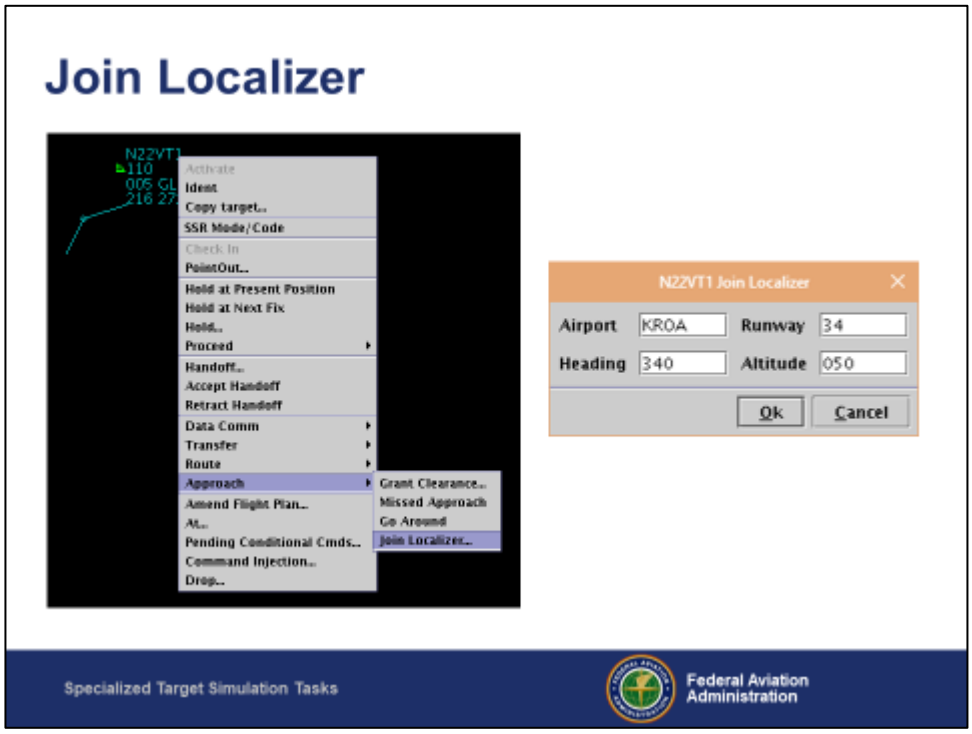
Depending on the clearance, an Altitude Change command may need to be entered prior to executing the approach.

- For example, “Maintain 4000 feet until established on the Localizer, cleared ILS approach.”

ATCoach will reject an ILS approach clearance if the intercept altitude is too high or too low, the intercept angle is too wide, or the heading is greater than 30 degrees from the runway heading.

After the command is entered and accepted, if any Heading (H) or Altitude (A) is input, the Approach command must be reentered.

Slide - 26.



Student Content

The Join Localizer command causes a target to intercept a localizer and land. To do so:

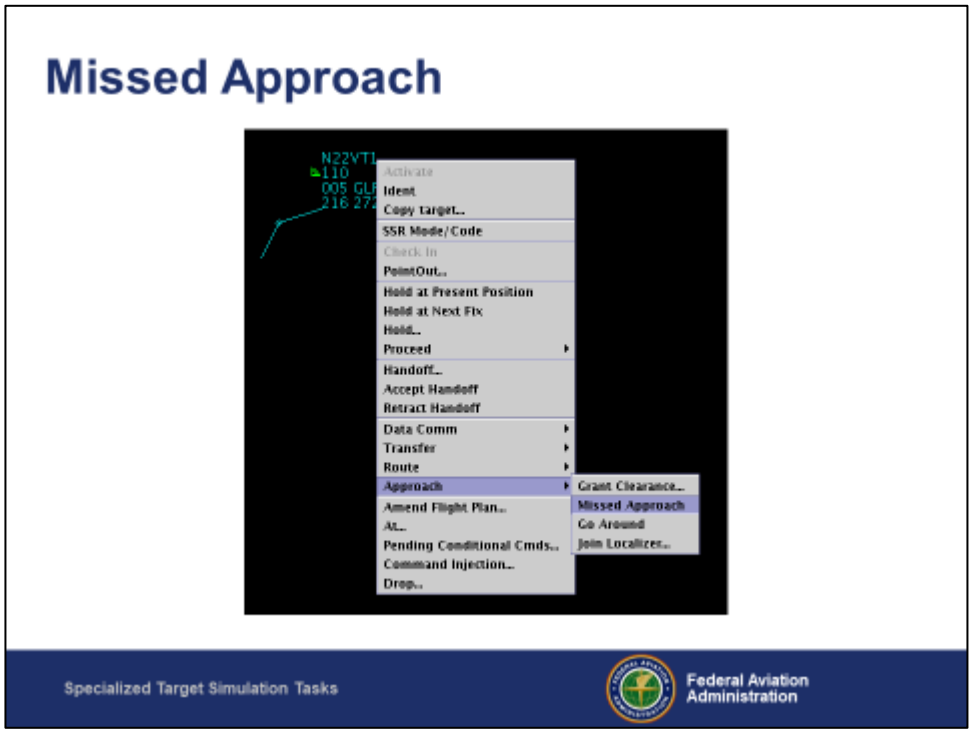
1. Select the **Join Localizer…** option. The Join Localizer dialog will open.
2. Enter the Airport Identifier (the K is required).
3. Enter the runway number.
4. Enter the desired heading.
5. If desired, enter an altitude to descend to prior to executing the approach.

The aircraft will turn to the specified heading to intercept and become established on the localizer of the airport/runway, and will fly an ILS approach.

If the optional altitude is specified, the aircraft will descend to the specified altitude prior to executing the ILS approach.

ATCoach will reject the command if the intercept altitude is too high or too low, the intercept angle is too wide, or the heading is greater than 30 degrees from the runway heading.

Slide - 27.



Student Content

The Missed Approach command is used for targets that are established on any part of the approach after a Grant Clearance or the localizer after a Join Localizer command was accepted. The target will complete the approach, then execute a missed approach as defined by a scenario developer.

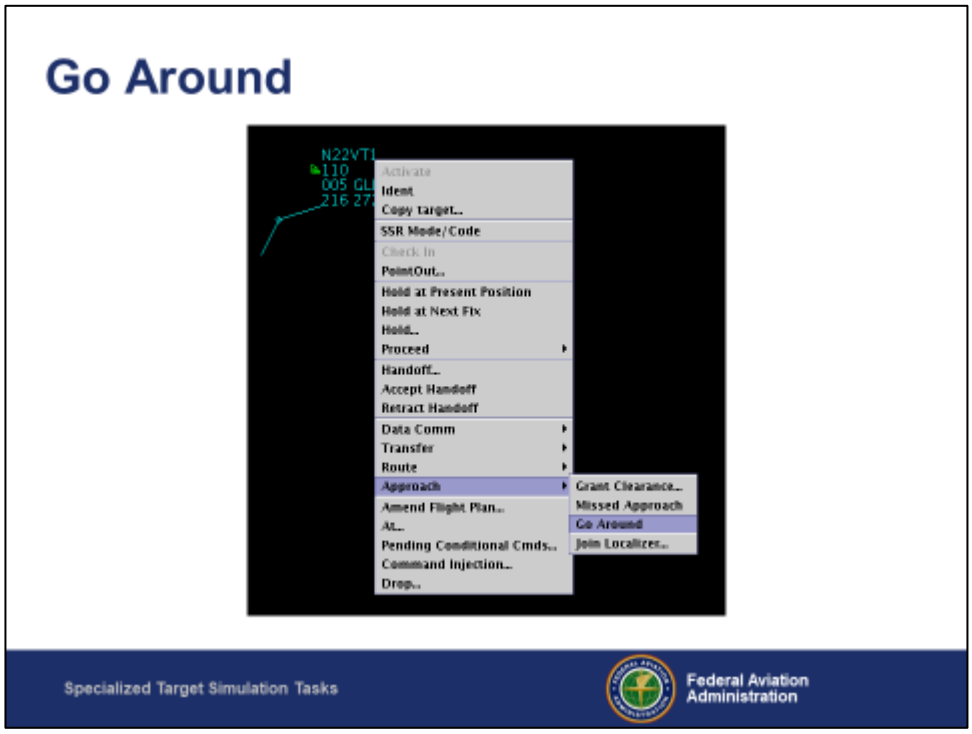
To do so:

1. Select the **Approach** option on the Target Control menu. A sub-menu will appear.
2. Select the **Missed Approach** option in the sub-menu.

There is no feedback if the missed approach command works. The aircraft will continue on the approach to the missed approach point, and then execute the missed approach procedure. The defined missed approach procedure will include a hold location and published holding pattern.

If no missed approach has been defined, the target completes the approach, climbs to 3000 feet above the runway, and holds.

Slide - 28.



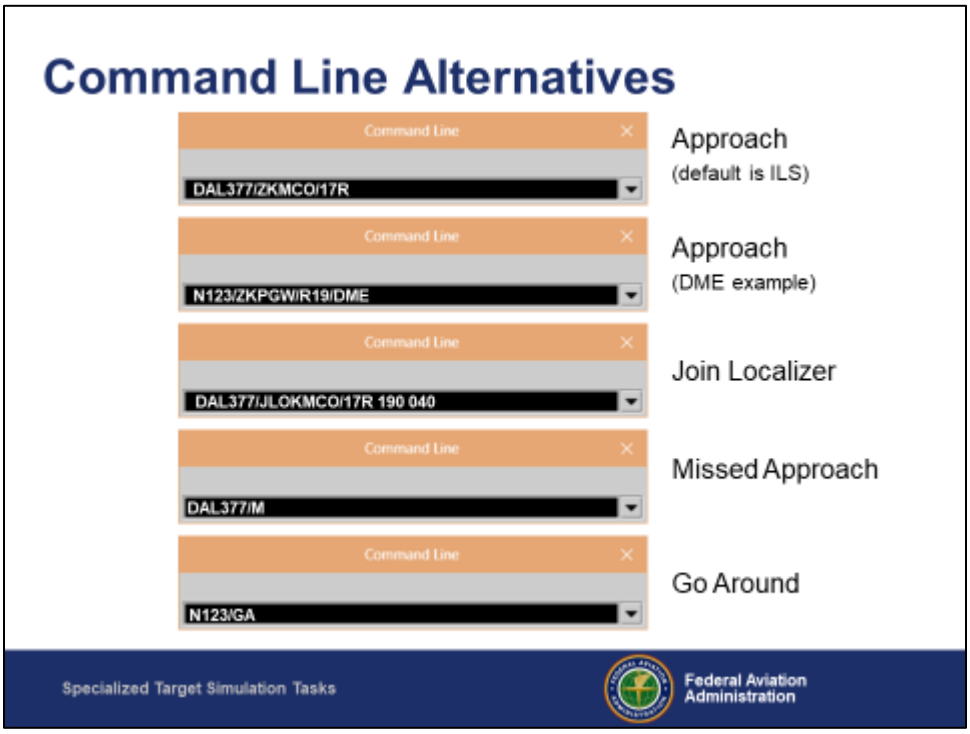
Student Content

The Go Around command causes a target on an ILS approach to immediately abort the approach and continue on the runway heading. The target will immediately begin to climb to 3,000 feet above the field elevation.

To execute a Go Around:

1. Select the **Approach** option on the Target Control menu. A sub-menu will appear.
2. Select the **Go Around** option in the sub-menu.

Slide - 29.



Student Content

The ILS Approach command (Z) can be entered in the command line to execute an approach. The letter Z is followed by the following fields:

- Airport Name
- Runway
- Approach type - Not required for ILS approach

Slants are required between the airport name and the runway, as well as between the runway and approach type.

The top example shows the target cleared for KMCO ILS approach to runway 17R.

The bottom example shows a target clears for the KPGW DME approach to runway 19.

- Other approach types are GPS, VOR, DME, NDB, TACAN, ADF, and LDA.

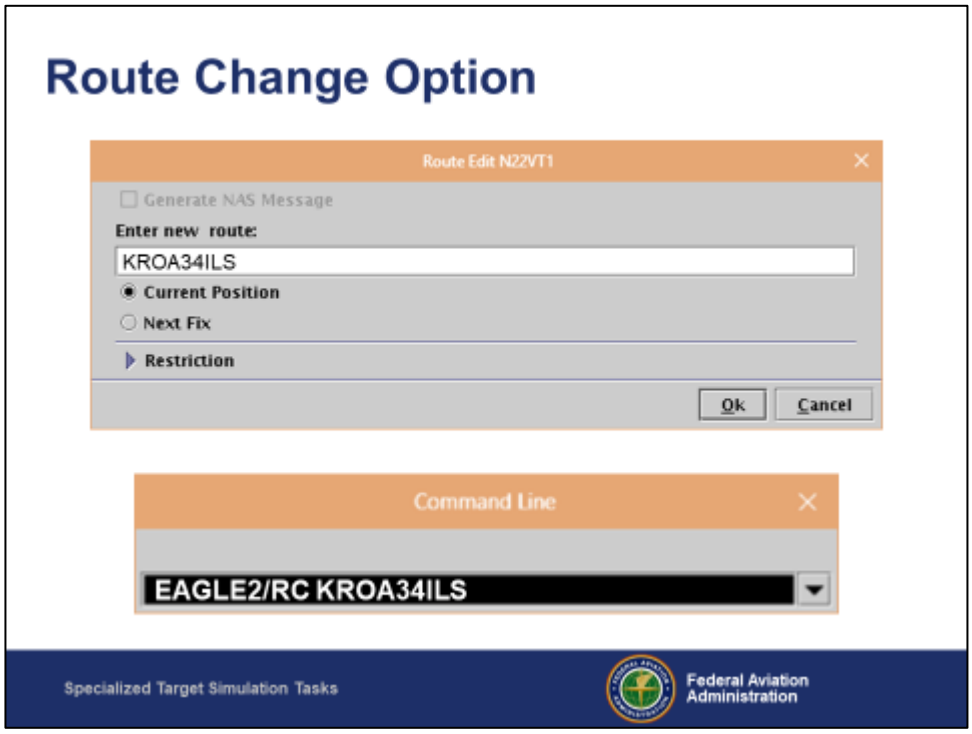
The Join Localizer command (JLO) is used to intercept a localizer and execute the approach. The JLO command is followed by the following fields:

- Airport Name
- Runway
- Intercept Heading
- Altitude (optional)

Slants are required between the airport name and the runway. Spaces are required between the runway and heading, and between the heading and altitude (if one is entered).

The Missed Approach (M) and Go Around commands (GA) can also be entered in the command line.

Slide - 30.



Student Content

The second method scenario developers use to create flight paths that simulate approaches is to define an ATCoach route. The new route includes a set of fixes with optional altitude/speed changes at the appropriate fixes.

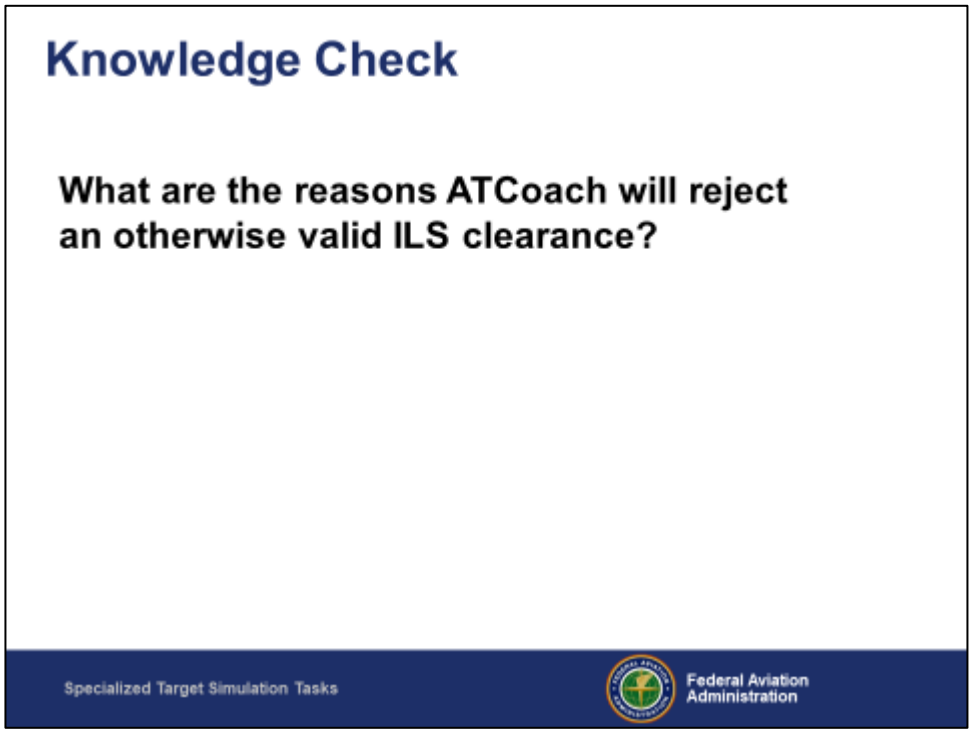
To execute an approach using this method:

1. Right-click on the target callsign to open the Target Control menu.
2. Select the **Route** option to open a sub-menu.
3. Select the **Route** option on the sub-menu. The Route Edit dialog will open.
4. Enter the route name provided by the scenario development team.
5. Click **Ok**.

The Missed Approach and Go Around commands will not work if the Route Change method is used to create the approach path. Scenario developers can create new routes to simulate missed approach or go around paths.

The Route Edit dialog generates an RC ATCoach command. The RC command can be entered in the command line.

Slide - 31.

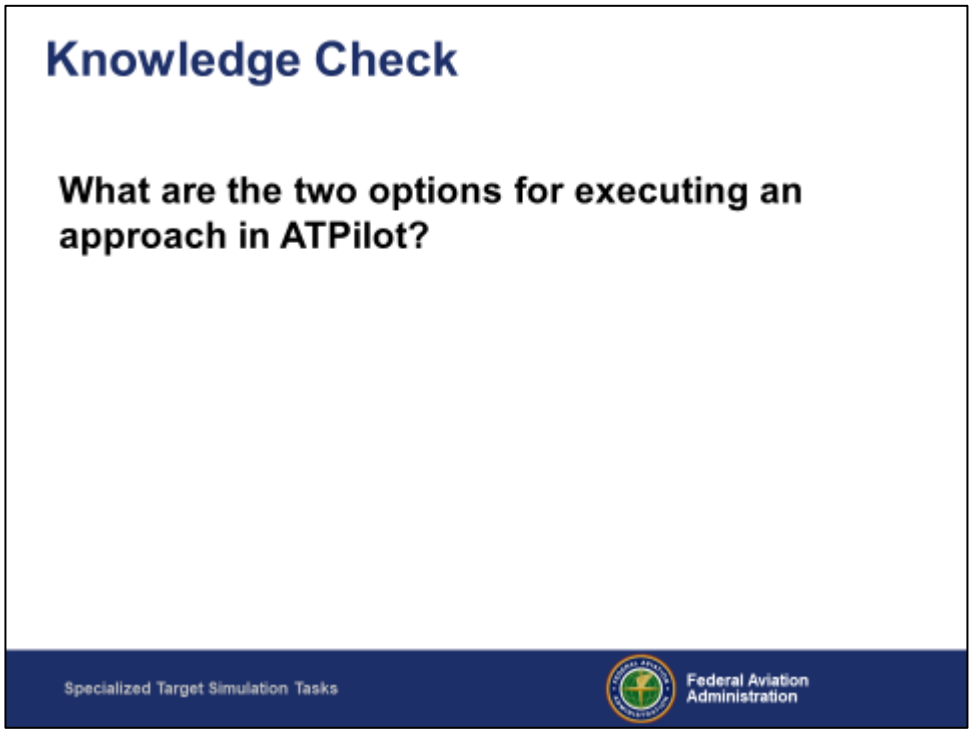


Instructor Notes

For all Knowledge Check questions, once a student has answered, click once to reveal the answer.

Answer: Target altitude is too low/high, intercept angle is too wide or heading greater than 30 degrees from the runway heading.

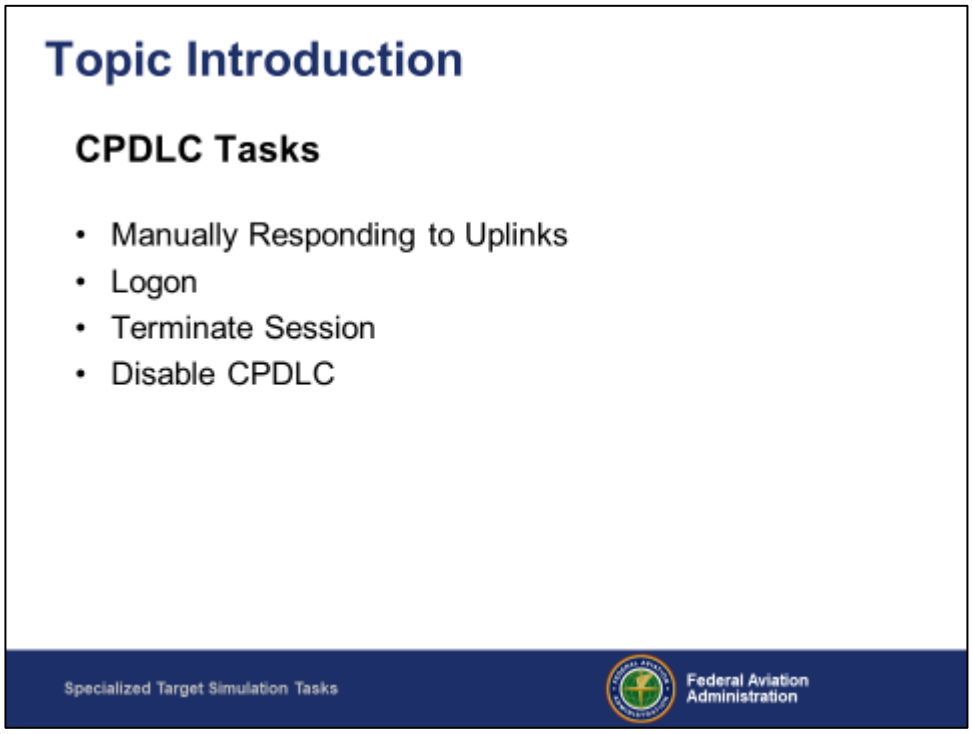
Slide - 32.



Instructor Notes

Answer: Defined Approach or Route Change.

Slide - 33.



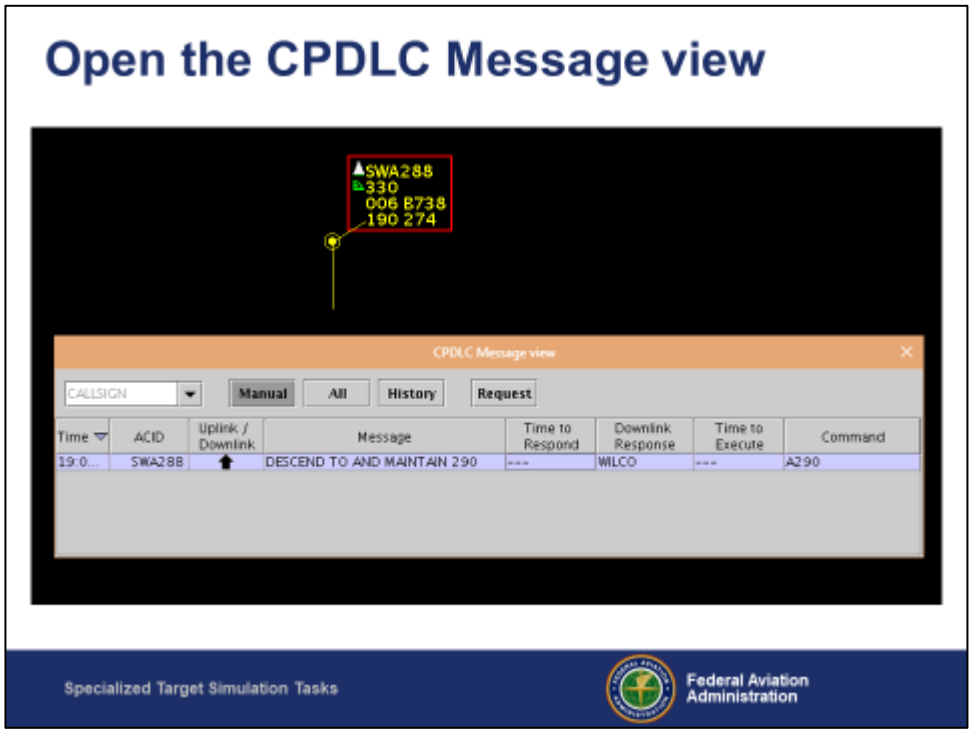
Student Content

In previous lessons, we introduced CPDLC, described the CPDLC Message view contents, how to send Pilot Initiated Downlinks (PIDs), and CPDLC Automatic Response mode processing.

In this lesson, we will cover four less frequently performed CPDLC functions:

- Manually responding to CPDLC uplinks.
- Logging on to the CPDLC ground system.
- Terminating a CPDLC session.
- Disabling the Target's CPDLC system.

Slide - 34.



Student Content

An Attention Required Indicator will be displayed whenever a target with a CPDLC response mode set to Manual receives an uplink from the controller. The indicator alerts the Ghost Pilot that a response is needed.

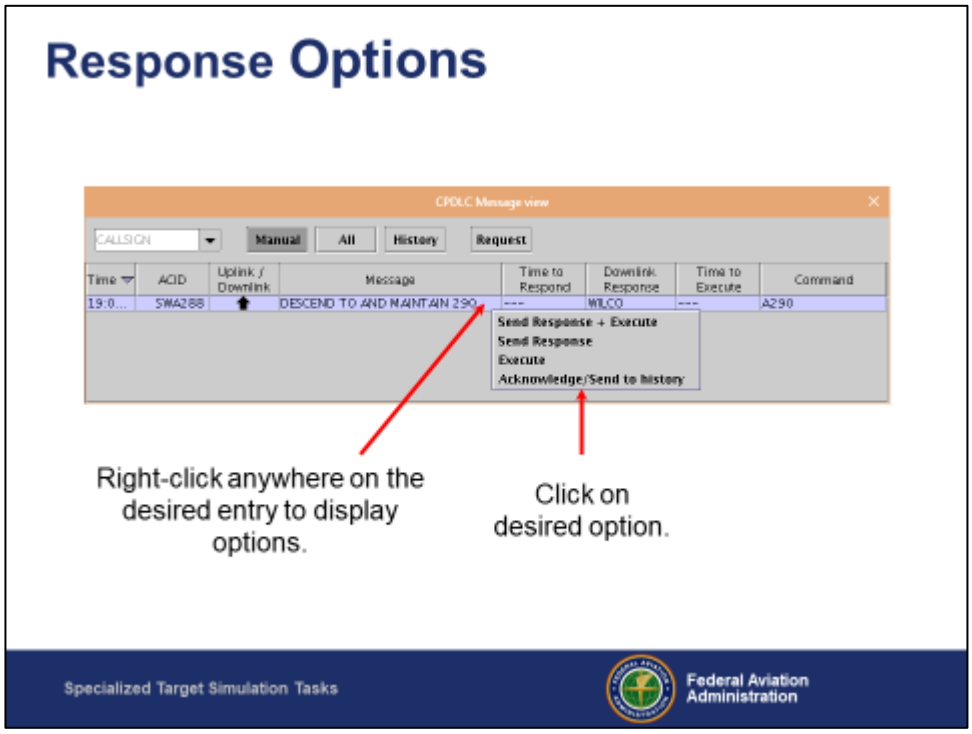
Click on the target callsign to open the CPDLC Message view with the uplink highlighted. If the view is already open, the uplink will be highlighted.

In Manual response mode, ATPilot will:

- Set a default response of WILCO or ROGER depending on message type (but will not send it).
- Derive the required ATCoach command to comply with the clearance (but will not execute it).
- No timer is displayed in the Time to Respond and Time to Execute columns of the view since the Ghost Pilot must respond and/or execute manually.

Since ATPilot does not validate the derived ATCoach command, the standard procedure should be to execute the ATCoach command then, if successful, send the WILCO response. If the ATCoach command is rejected, the Ghost Pilot should send an UNABLE response (covered later in lesson).

Slide - 35.



Student Content

To send a response:

1. Right-click anywhere on the desired entry. A pop-up menu will be displayed.
2. Click on the desired option.

Again, the standard procedure should be to execute the command and, if successful, send the WILCO response. Select **Send Response + Execute** only if you are positive the target can comply.

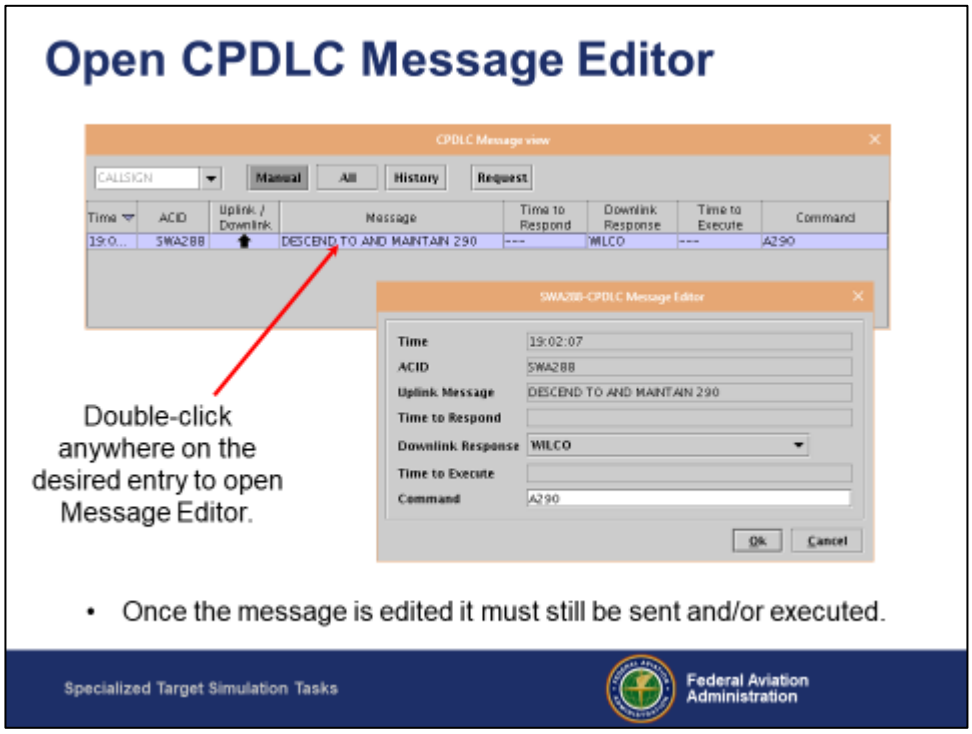
There are four options:

- Send Response + Execute
  - Immediately sends the response specified in the Downlink Response column.
  - Starts the Time to Execute timer. Once the timer expires, the command will be executed.
  - The entry is moved to the History section a few seconds after the command is executed.
  - This option is only available for entries with an ATCoach command and no response, other than STANDBY, has been sent.

- Send Response
    - Immediately sends the response specified in the Downlink Response column.
    - The Time to Execute timer will not begin.
    - The Uplinked Message will not be moved to the History section.
    - This option is only available for entries for which no response, other than STANDBY, has been sent.
- Execute
    - Immediately executes the command in the Command column.
    - A response downlink will not be sent.
    - This option is only available for entries with an associated ATCoach command that has not been executed
- Acknowledge/Send to history
    - Immediately moves the message to the History section regardless of whether a response has been sent or not.
    - A Downlink Message response will not be sent.
    - The command will not be executed.
    - If an entry is moved to the History tab without sending the response or executing the command, the Ghost Pilot cannot retrieve it and send the response or execute the command.
    - A confirmation prompt will appear anytime this option is selected.

Note that if a Ghost Pilot changes a response to UNABLE, the SEND+EXECUTE and EXECUTE options will be grayed out.

Slide - 36.



Student Content

The response values displayed in a CPDLC Message view entry can be modified using the CPDLC Message Editor dialog.

To open the dialog, double-click anywhere on the desired entry.

Not all fields can be edited. The fields that can be edited will depend on the type and status of the message transaction. For example, if a response has been sent, the Downlink Response field can no longer be edited.

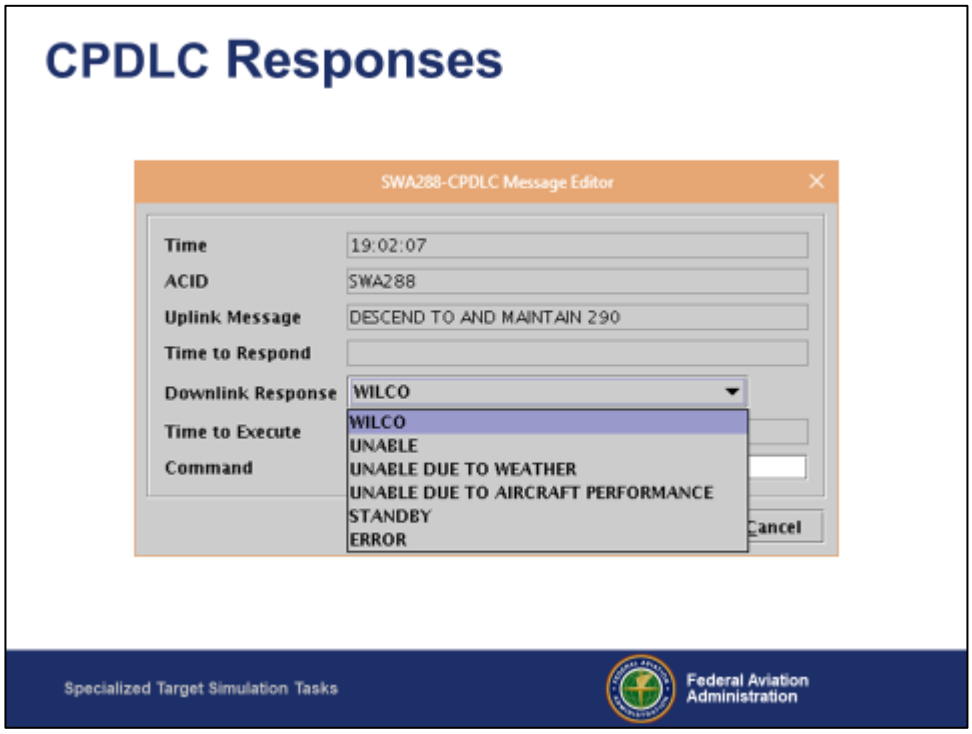
Fields that cannot be edited have a light gray border. Fields that can be edited have a black beveled border.

- In the example shown, only Downlink Response and Command can be edited.

Typically, the key field to change will be the Downlink Response.

Once the message is edited, it still must be sent and/or executed.

Slide - 37.



Student Content

The possible response options to a typical uplink are:

- WILCO
- UNABLE
- UNABLE DUE TO WEATHER
- UNABLE DUE TO AIRCRAFT PERFORMANCE
- STANDBY
- ERROR

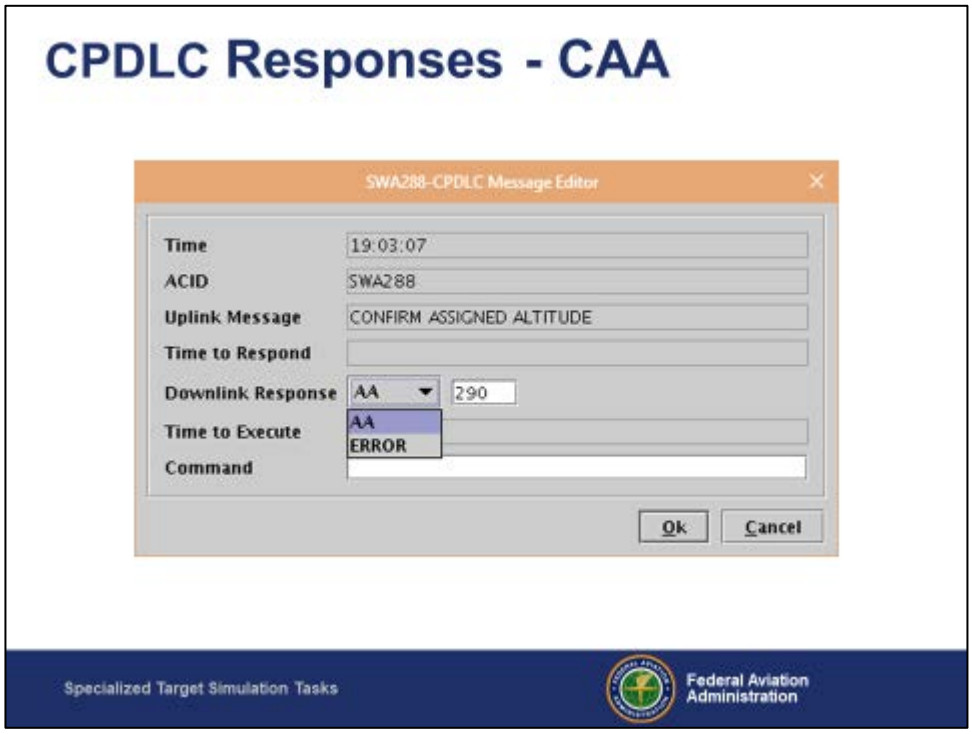
A STANDBY response tells the controller that a further response is forthcoming. When a STANDBY response is sent, the entry will remain in the CPDLC Message view so the final response can be sent later.

To change a Downlink Response, assuming the dialog is open:

1. Click on the pull-down list icon on the right side of the field.
2. Select the desired response.
3. If desired, make any other changes to the editable fields.
4. Click **Ok**.

The new values will be displayed in the CPDLC Message view entry. The response must still be sent, and the command executed as previously described.

Slide - 38.



Student Content

During a silent check-in, CPDLC uplinks a Confirm Assigned Altitude (CAA) message to the aircraft. The aircraft responds by downlinking the currently cleared altitude. The system then compares the downlinked altitude to the ERAM assigned altitude and alerts the controller if there is a mismatch (IC Mismatch).

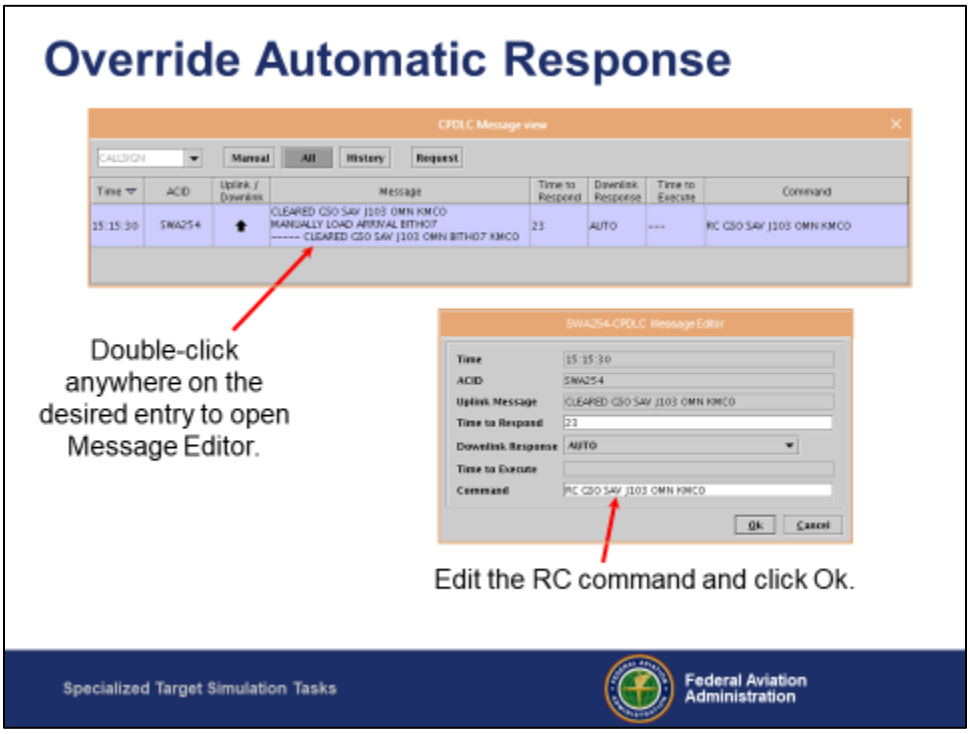
The Confirm Assigned Altitude message can also be manually uplinked by the controller.

The Downlink Response options in the CPDLC Message Editor dialog are different when the response being sent is to a CAA uplink. The two options are:

- AA (Assigned Altitude)
- ERROR

If the response is set to AA, the assigned altitude must also be specified. The default value is the target's current assigned altitude. The Ghost Pilot can change the assigned altitude to create an IC Mismatch.

Slide - 39.



Student Content

In some cases, if a route uplink includes a STAR, the ghost pilot may need to take action even if the aircraft is in Automatic response mode. An Attention Required Indicator will be displayed.

The uplinked route will be highlighted in light blue in the CPDLC Message View and depict the cleared route that will be Wilco'd by the Ghost Pilot.

Additional text will instruct the Ghost Pilot to "MANUALLY LOAD ARRIVAL" and the arrival name.

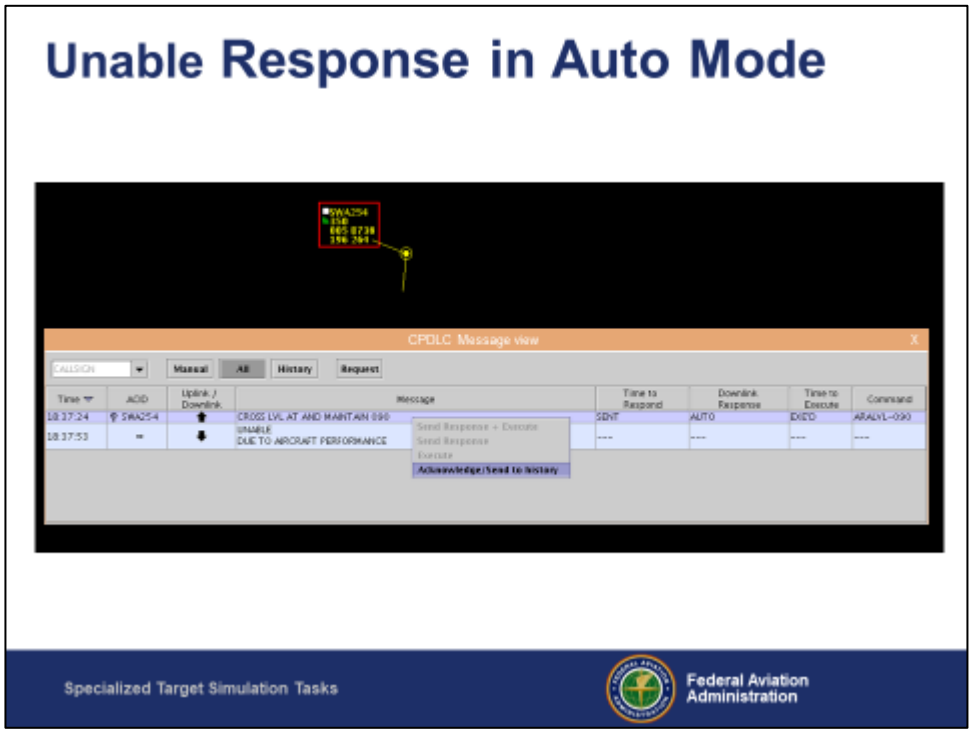
The Ghost Pilots will need to decide if updating the target route is warranted for the training sector and if so, update the route in the Command field of the CPDLC Message Editor.

- The response or execution timers will pause while the editor dialog is open.
- Once the **Ok** button on the editor dialog is clicked, the timers will resume.
- The Ghost Pilot could also manually send the response and/or execute the command as previously described.

If the derived route change command has been automatically executed, but additional fixes are required, update the route via other methods.

The Ghost Pilot can also use the editor to override any response to a target in Automatic response mode.

Slide - 40.



Student Content

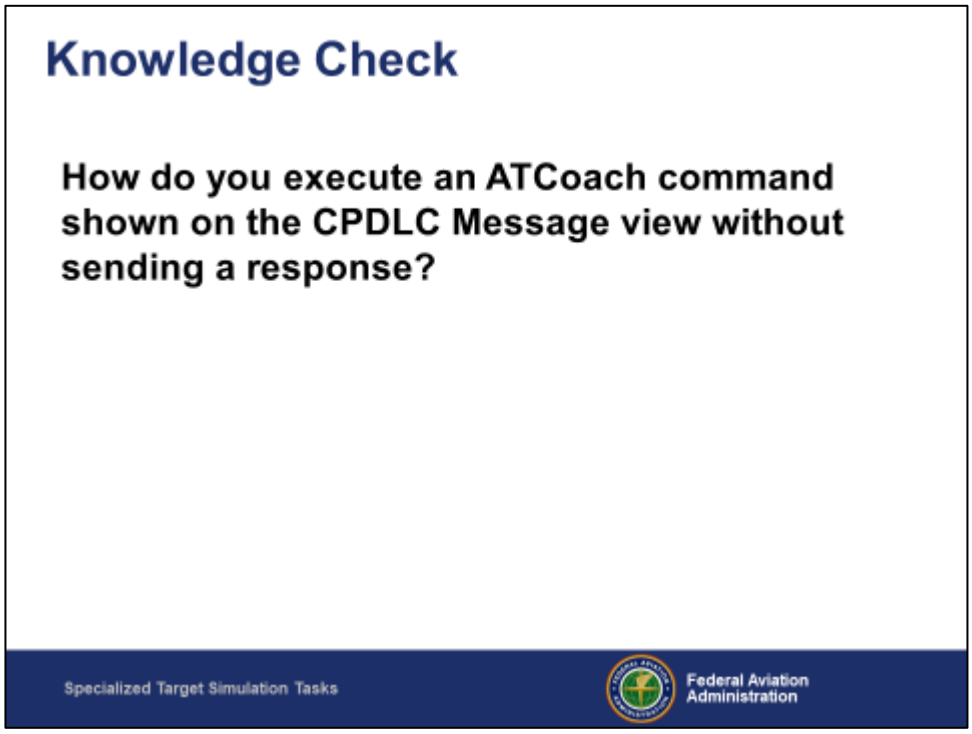
An Attention Required Indicator will be displayed when a target is set to Automatic response mode and ATPilot determines the derived ATCoach command cannot be executed. For example, if a crossing restriction cannot be met due to distance and aircraft performance characteristics.

In that case, ATPilot will automatically send an UNABLE response. Ghost Pilots should expect the controller to contact them via voice.

To clear the Attention Required Indicator:

1. Right-click anywhere on the desired entry. A pop-up menu will be displayed.
2. Click on **Acknowledge/Send to history**. It is the only available option.

Slide - 41.

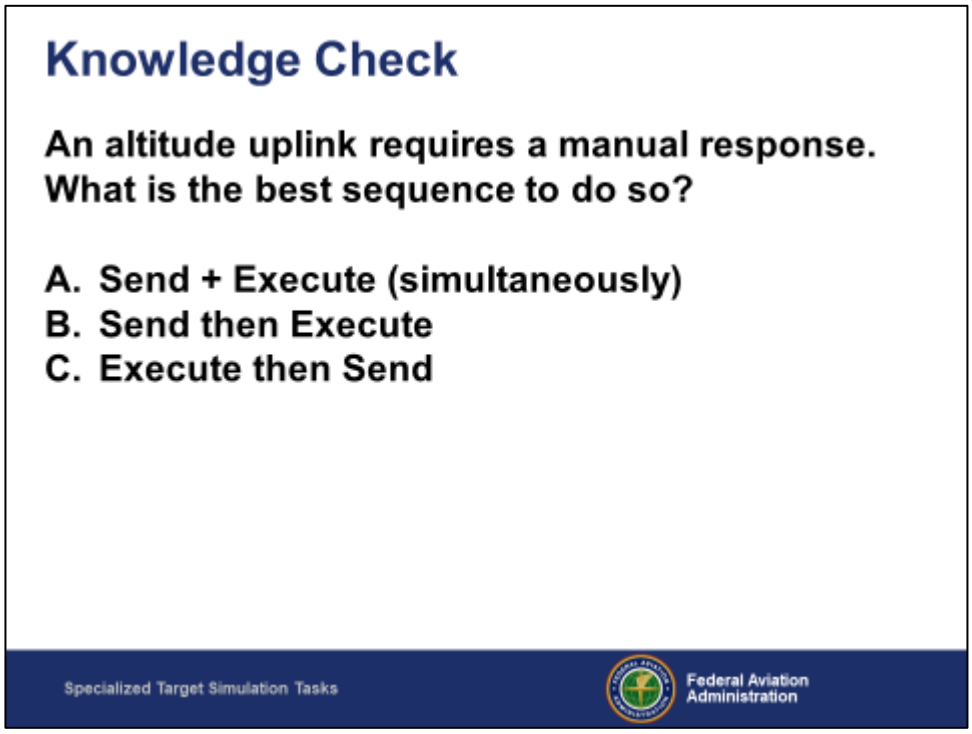


Instructor Notes

For all Knowledge Check questions, once a student has answered, click once to reveal the answer.

Answer: Right-click anywhere on the desired entry to access the pop-up menu, then click on the Execute option.

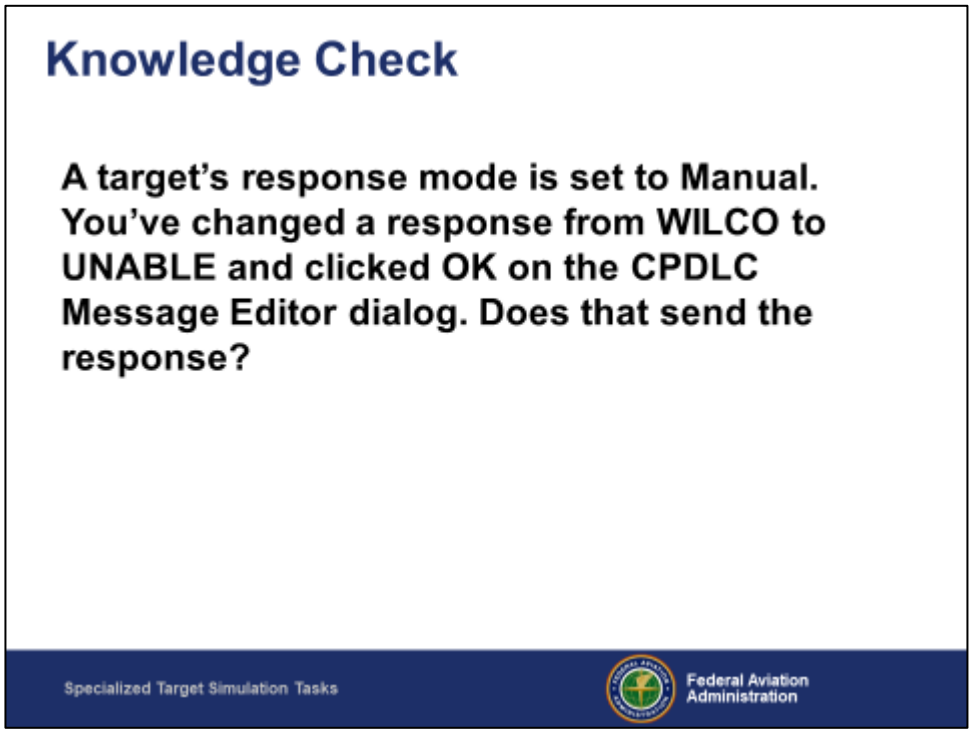
Slide - 42.



Instructor Notes

Answer: C

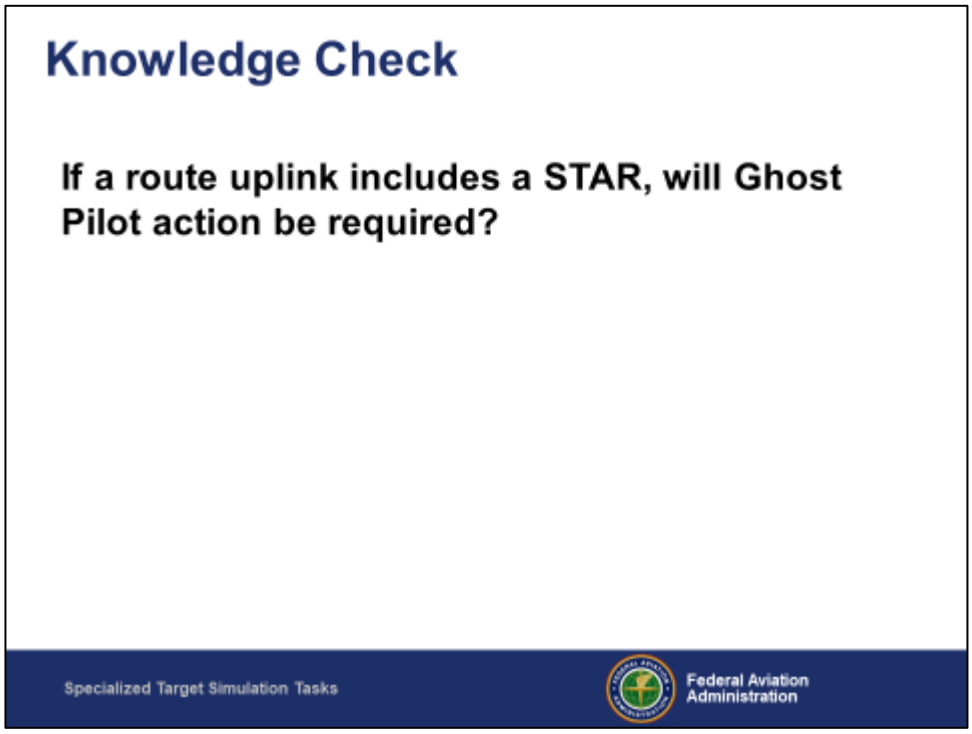
Slide - 43.



Instructor Notes

Answer: No. The response still needs to be sent.

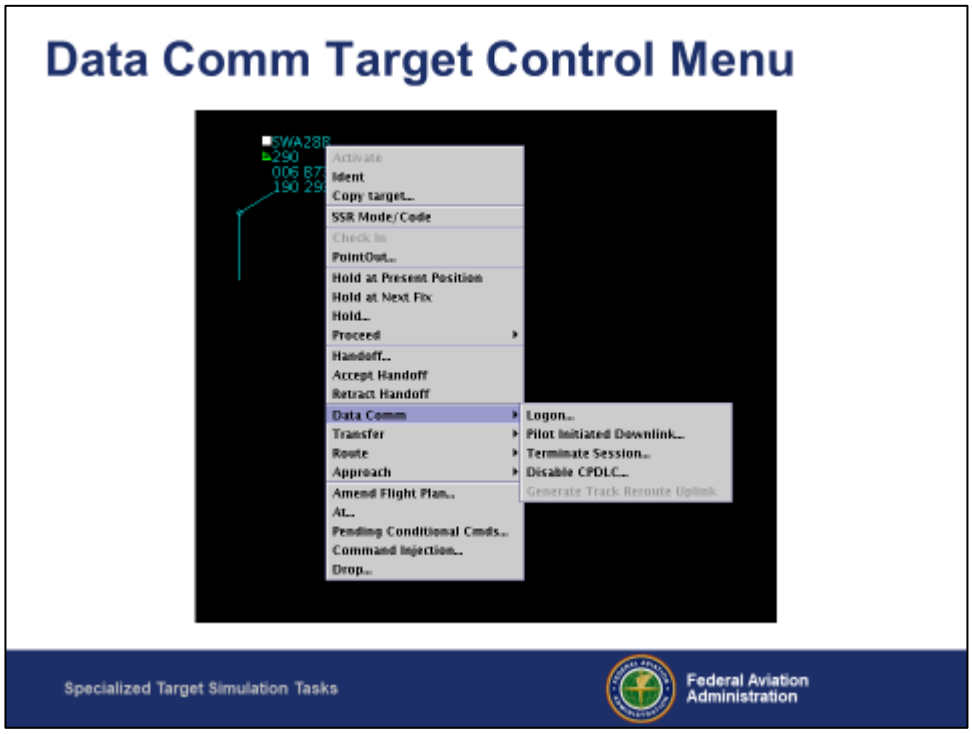
Slide - 44.



Instructor Notes

Answer: Yes, the Ghost Pilot must review the route and determine if the ATCoach route needs to be modified.

Slide - 45.



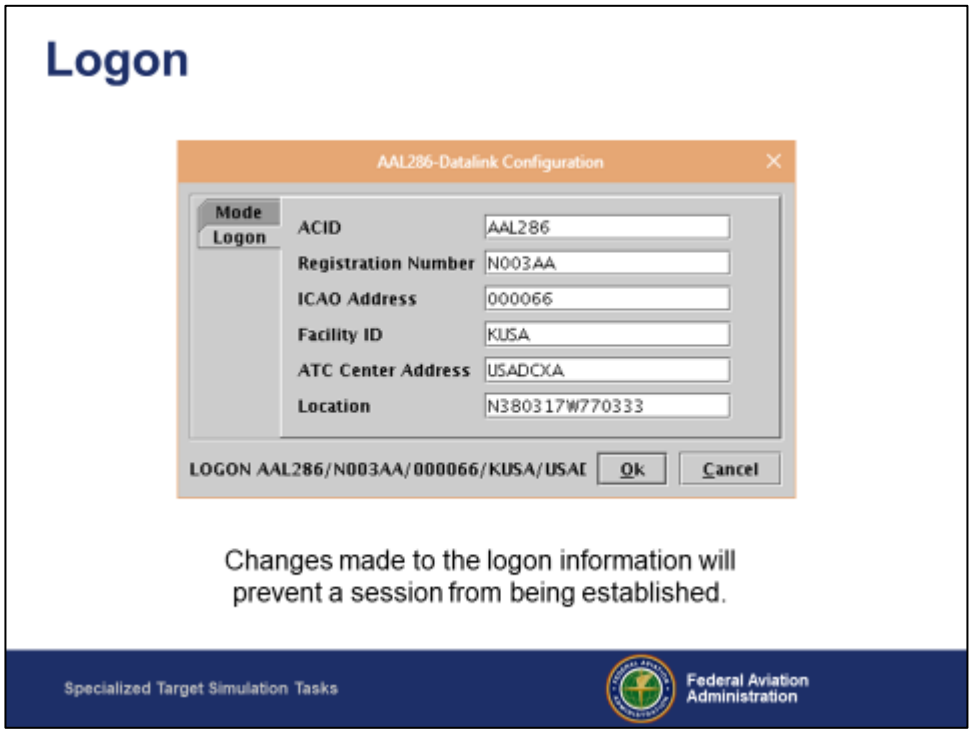
Student Content

The Data Comm option on the Target Control menu opens a sub-menu with the following five options:

- Logon…
- Pilot Initiated Downlinks… (already covered)
- Terminate Session…
- Disable CPDLC…
- Generate Track Reroute Uplink (already covered)

In the next few slides we will discuss the three options not yet covered.

Slide - 46.



Student Content

When **Logon…** is selected, the Datalink Configuration dialog will be displayed. The dialog has two tabs:

- Logon
- Mode

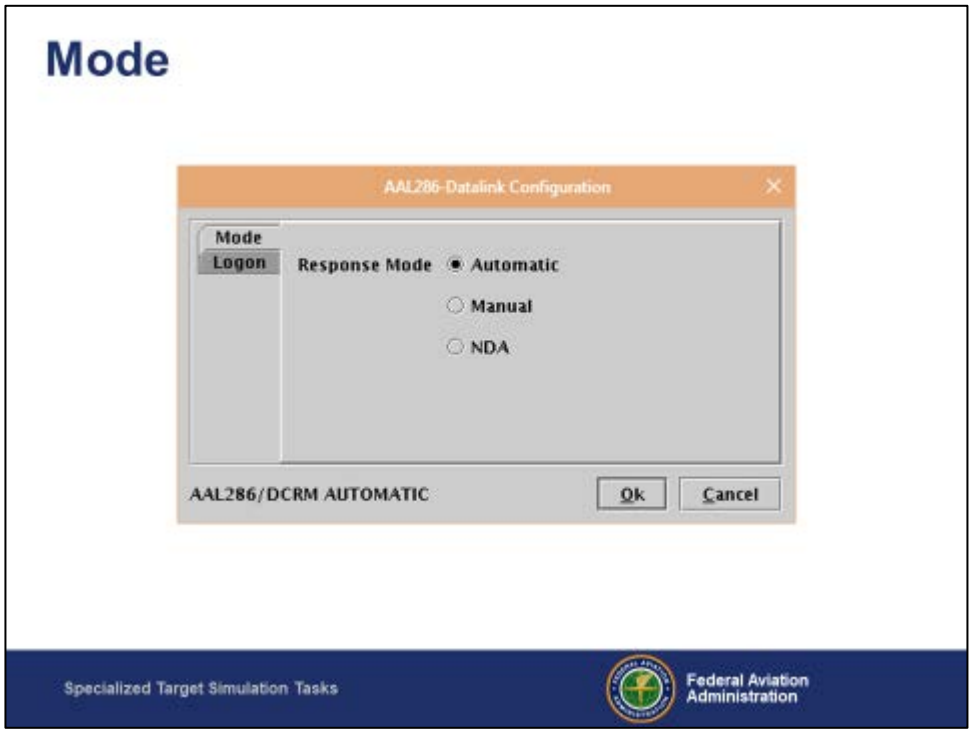
The Logon tab is used to log a CPDLC equipped target onto the CPDLC ground system. If the logon is successful, the session establishment process will start.

The fields in the dialog are automatically filled. Click **Ok** to complete the task.

Note that changes made to the logon information will prevent a session from being established.

This dialog can also be accessed by clicking on the GPDCS field of a target in the AAL or FAL.

Slide - 47.



Student Content

The Mode tab is used to change a target's CPDLC Response Mode. The three options are:

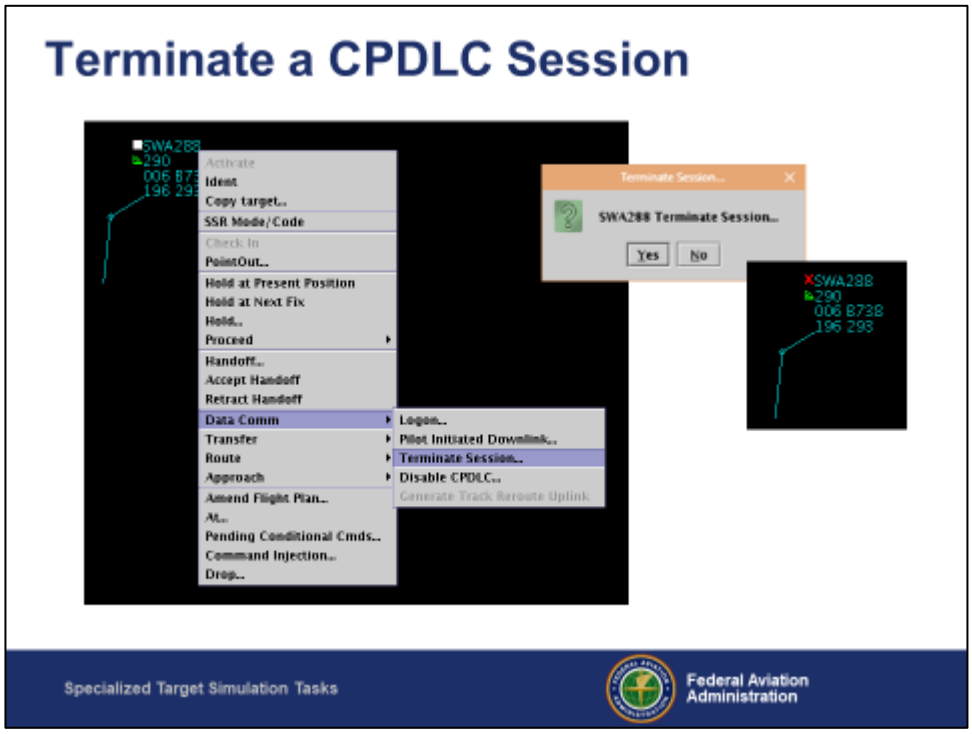
- Automatic
- Manual
- NDA

To change the mode:

1. Click on the desired radio button.
2. Click **Ok**.

This dialog can also be accessed by clicking on the DC field of a target in the AAL or FAL.

Slide - 48.



Student Content

The **Terminate Session…** option is used to terminate a target's CPDLC session.

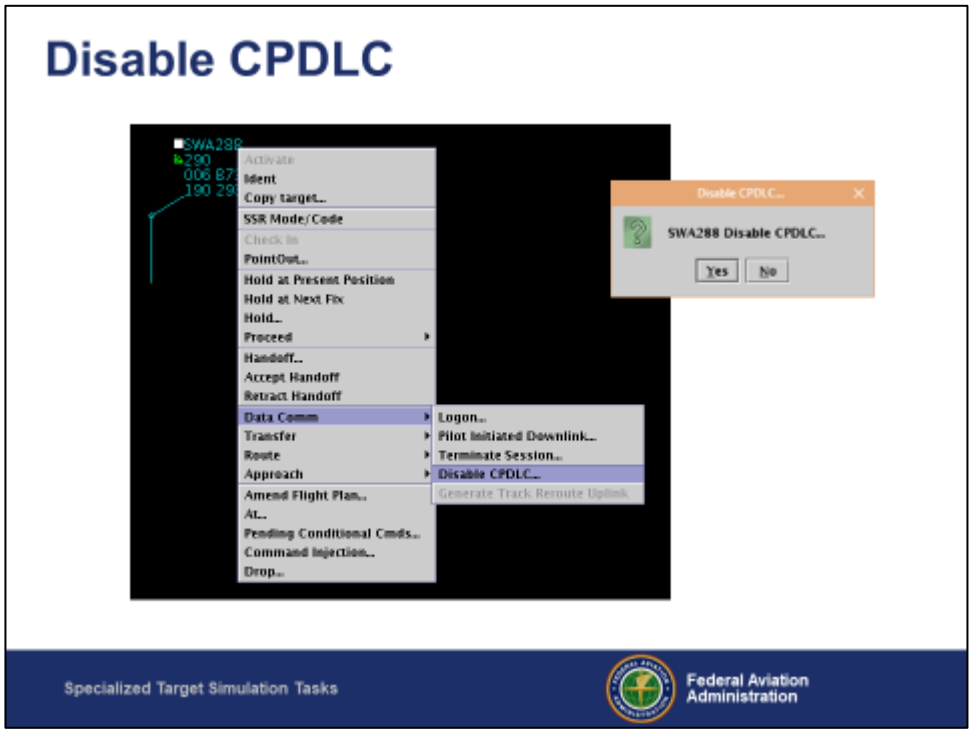
A confirmation window is displayed when the option is selected. Select **Yes** to confirm the command, or **No** to cancel the action.

After the session is terminated:

- Any pending message in the CPDLC Message view is moved to the history section.
- The Logon status will change to No Logon Sent.
- If the Attention Required indicator is displayed due to an open Uplink, the indicator will be removed.
- A Failed Session indicator (i.e., red X) is displayed to the left of the callsign on the data block.
- No CPDLC functionality, other than Logon, will be available.

The controller will also see a Failed Session indicator on the R and RA-positions.

Slide - 49.



Student Content

The **Disable/Enable CPDLC** option is a toggle that turns a target's CPDLC functionality on or off. It is available for all CPDLC equipped targets.

When CPDLC functionality is enabled, the **Disable CPDLC** option is shown.

A confirmation window is displayed when **Disable CPDLC** is selected. Click **Yes** to confirm the action, or **No** to cancel it.

After CPDLC has been disabled, the target will act as if it was not CPDLC equipped.

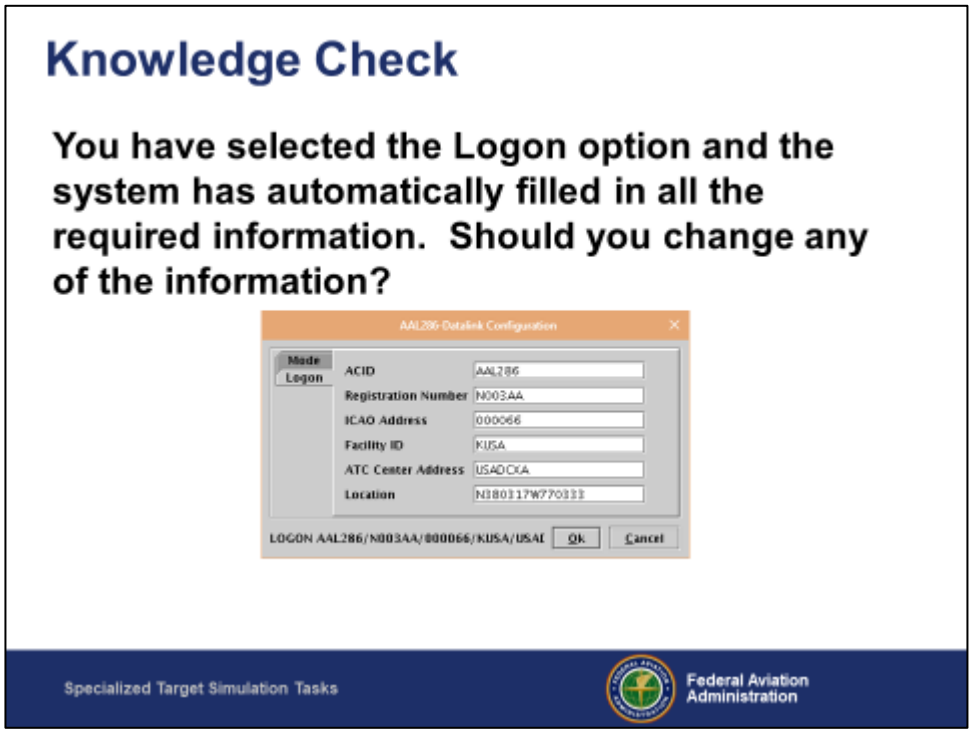
- Any new uplink is discarded and not displayed in the CPDLC Message view.
- Existing messages in the CPDLC Message view will remain displayed, but neither automatic nor manual response options will be available.
- The Send Response and Send Response + Execute options in the command will not be selectable.
- Any pending ATCoach command whose execution timer has begun will still be executed when the timer expires.
- If the Ghost Pilot entered a reply to an uplink, but the system has not sent the reply due to the Network Delay timer, the reply will still be sent.

- The Logon Message, Pilot Initiated Downlink, and Terminate Session options will be unavailable from the data block command selection list.
- Any Uplink Message or Downlink Message scripted in the scenario will be discarded.
- The GPDCS column of the AAL/FAL is set to Disabled.

Note that the controller will still see the session indicator on the R and RA-position displays. The Ghost Pilot will see the session indicator as well.

When CPDLC is disabled, the **Enable CPDLC** option will be shown.

Slide - 50.

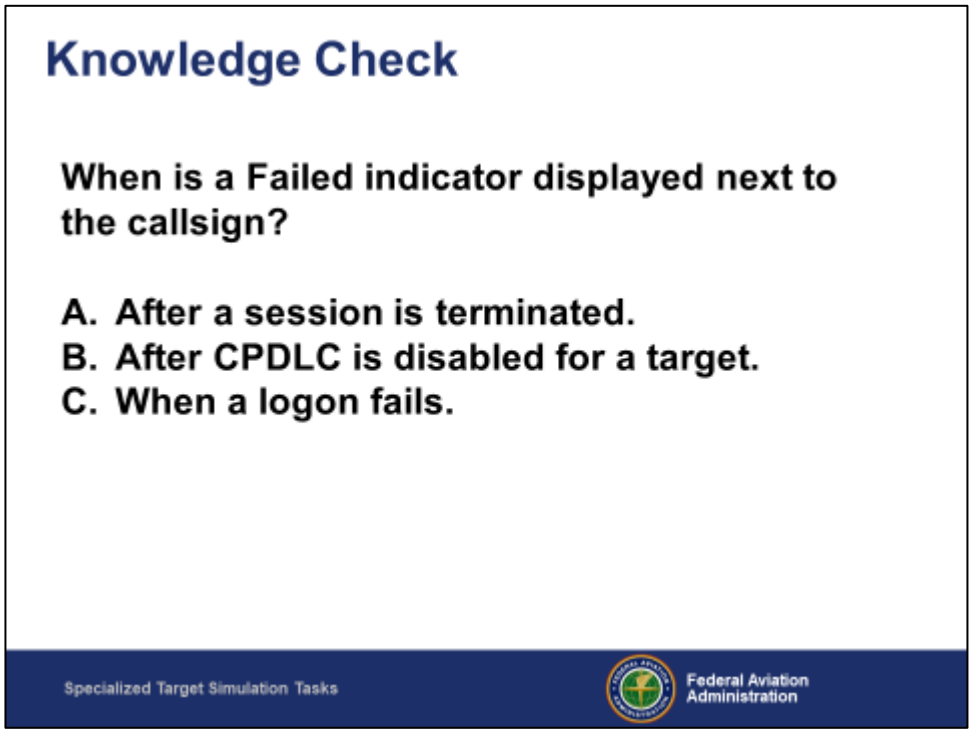


Instructor Notes

For all Knowledge Check questions, once a student has answered, click once to reveal the answer.

Answer: No

Slide - 51.

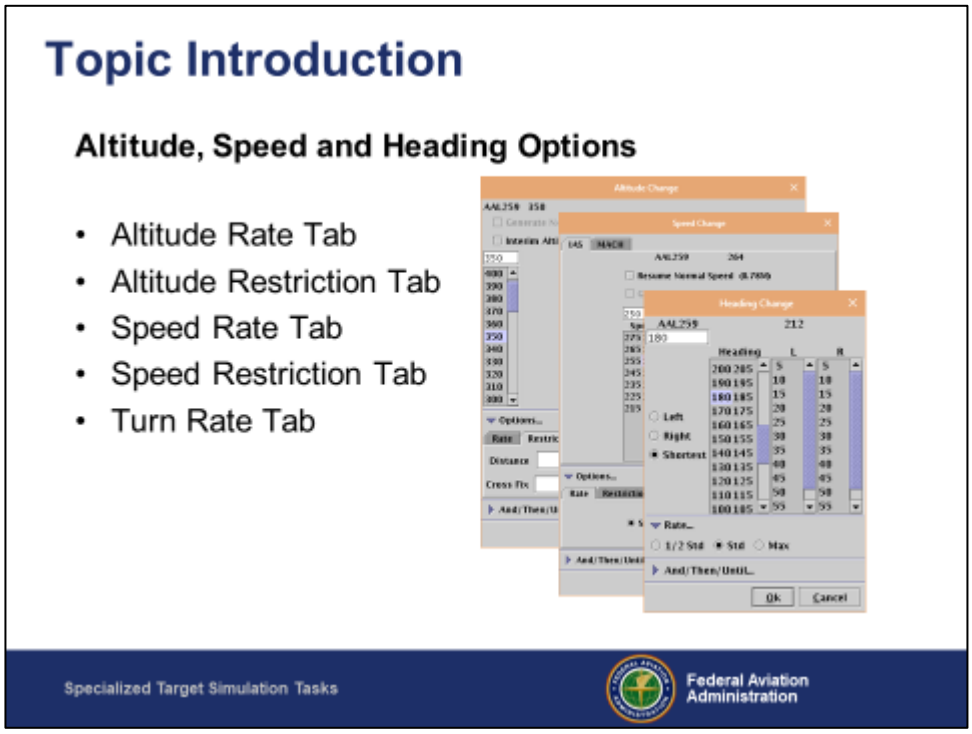


Instructor Notes

For all Knowledge Check questions, once a student has answered, click once to reveal the answer.

Answer: A

Slide - 52.



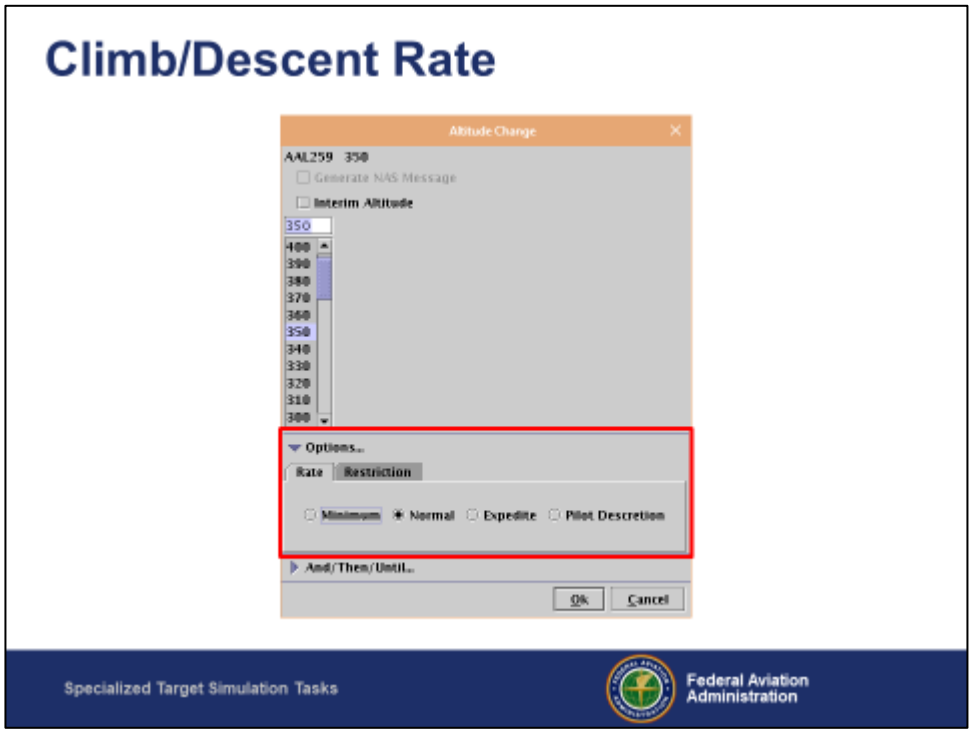
Student Content

In Lesson 3 we covered the basic functionality of the Altitude Change, Speed Change, and Heading Change dialogs. These dialogs also provide options to modify the basic target maneuvers.

Possible modifications are:

- Climb/descent rate
- Altitude crossing restriction
- Acceleration or Deceleration rate
- Speed crossing restriction
- Turn rate

Slide - 53.



Student Content

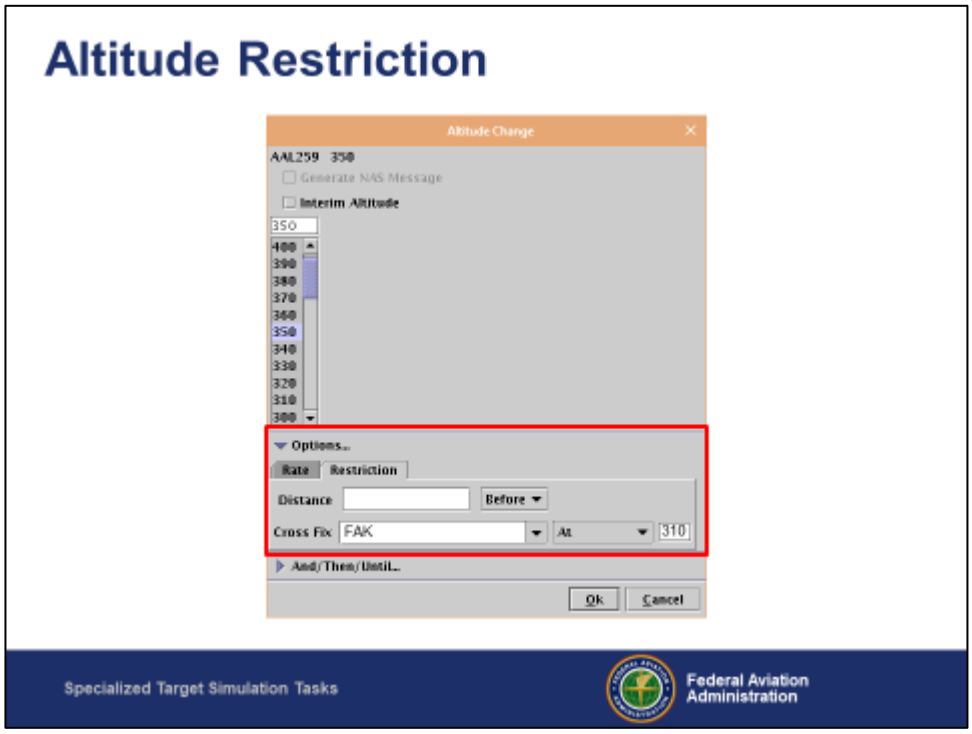
To specify a climb/descent rate:

1. Click on the **Options…** button to open the Options panel.
2. Select the Rate tab.
3. Select the radio button for the desired rate.
4. Complete the altitude change as previously described.

The climb/descent rates are based on aircraft type characteristics (i.e., B737) established in an ATCoach file that can be modified by scenario developers.

- Minimum — Reduces the Normal rate for that aircraft type by 50%.
- Normal — Uses the Normal rate for that aircraft type.
- Expedite — Uses the Maximum rate for that aircraft type.
- Pilot Discretion — Introduces a random delay before the command is executed.

Slide - 54.



Student Content

To specify an altitude crossing restriction at a fix:

1. Click on the **Options…** button to open the Options panel.
2. Click on the Restrictions tab.
3. Click on the desired final altitude.
4. Enter the desired restriction fix in the **Cross Fix** input box. Use the pull-down list or type the desired fix. The fix must be in the current route.
5. If desired, modify the restriction location by specifying a distance before or after the fix. Type the distance in the **Distance** input box. Select **Before** or **After** from the pull-down list.
6. Select the desired restriction type using the pull-down list to the right of the **Cross Fix** input box. The options are:
   - At (default)
   - At or Above
   - At or Below
7. Enter the desired restriction altitude in the altitude input box.
8. Click **Ok**.

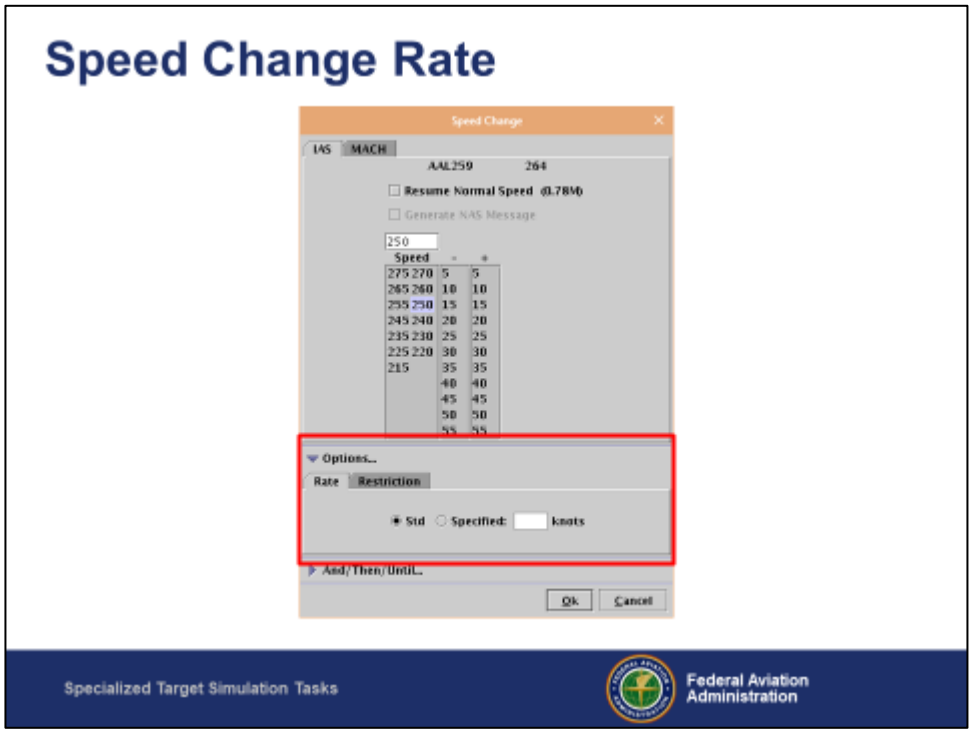
The following conditions will result in an error message:

- The fix is not on the target's route.
- The target is more than 150 miles from the fix.
- The target cannot meet the crossing restriction based on distance to the fix and aircraft characteristics.

When a crossing restriction requires a descent, the target may not start down immediately; i.e., the Ghost Pilot may not get immediate target feedback that the command worked. Initially, the only feedback the Ghost Pilot will receive is in the Role Play/Message view (until the logic starts the target down).

Be aware that after the crossing restriction is satisfied, the target will proceed to the final altitude selected in step 3.

Slide - 55.



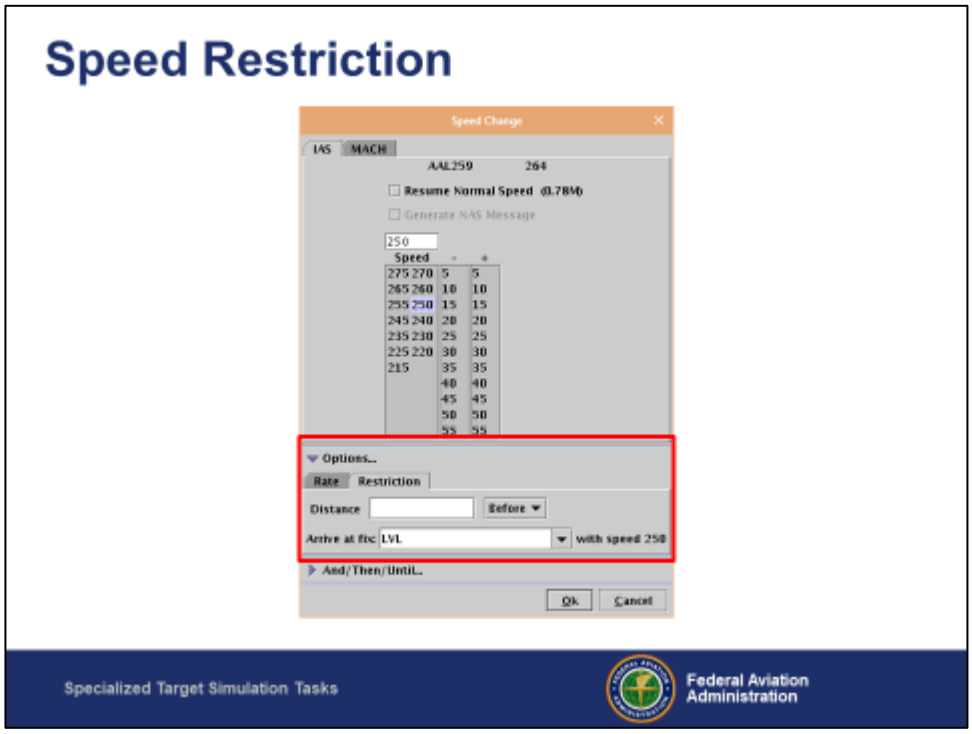
Student Content

To specify the acceleration/deceleration rate for a speed change:

1. Click on the **Options…** button to open the Options panel.
2. Select the Rate tab.
3. Click on the desired speed.
4. Select the radio button for the desired rate. **Std** (Standard) is the default.
5. If **Specified** is selected, type the desired rate in knots per minute (e.g. 10).
6. Click **Ok**.

The acceleration/deceleration rates are based on aircraft type characteristics (i.e., B737).

Slide - 56.



Student Content

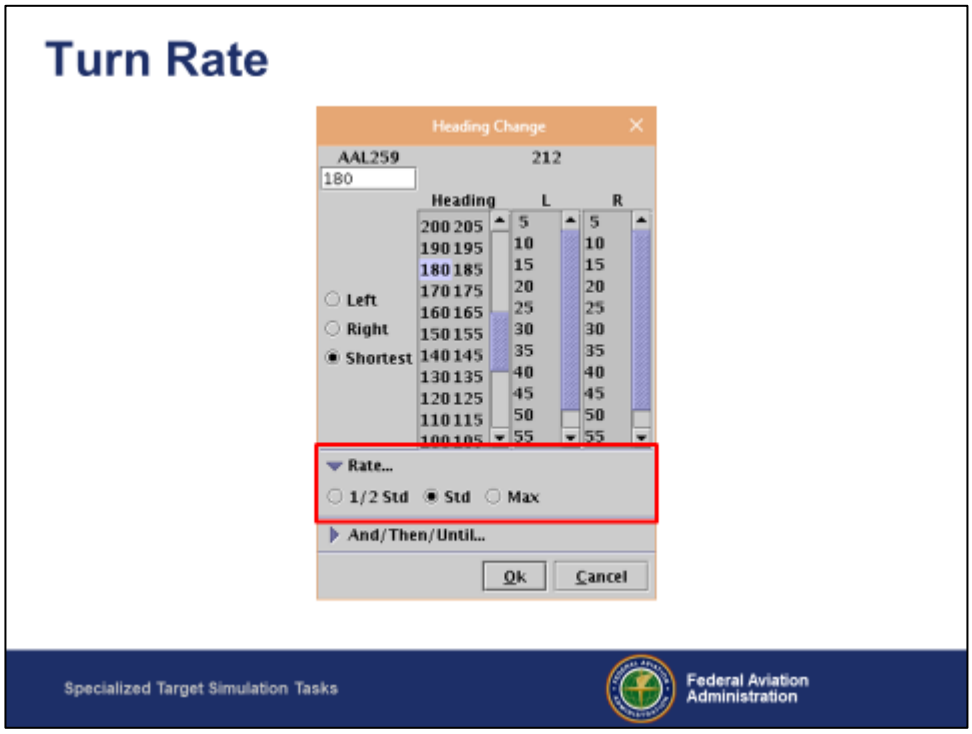
To specify a speed crossing restriction at a fix:

1. Click on the **Options…** button to open the Options panel.
2. Click on the Restriction tab.
3. Enter the desired fix in the **Arrive at fix** input box. Use the drop-down list or type the desired fix. The fix must be in the current route.
4. If desired, modify the restriction location be specifying a distance before or after the selected fix. Type the distance in the **Distance** input box. Select **Before** or **After** from the pull-down list.
5. Click on the desired restriction speed. The selection will appear to the right of the **Arrive at fix** input box.
6. Click **Ok**.

The following conditions will cause the system to display an error message:

- The fix is not on the target's route.
- The target is more than 150 miles from the fix.
- The target cannot meet the crossing restriction based on distance to the fix and aircraft characteristics.

Slide - 57.



Student Content

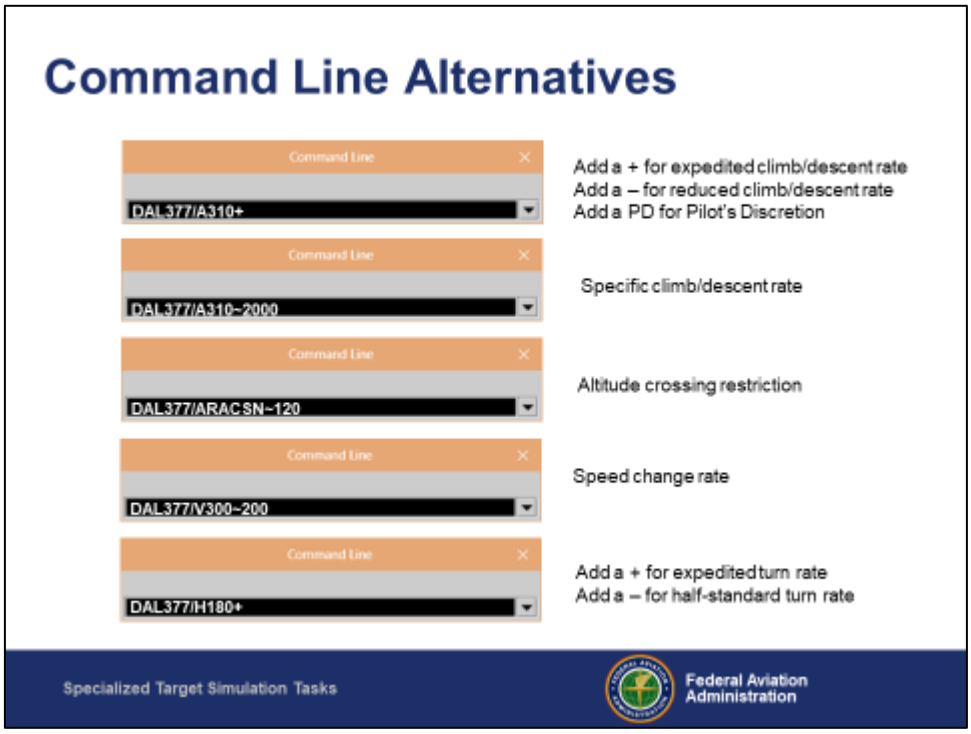
To specify a turn rate, assuming the Heading Change dialog is already open:

1. Select the Rate tab.
2. Select the radio button for the desired rate.
3. Select the desired heading.

The turn rates are based on aircraft type characteristics (i.e., B737).

- ½ Std Reduces the Normal rate for that aircraft type by 50%.
- Std Uses the Normal rate for that aircraft type (default).
- Max Uses the Maximum rate for that aircraft type.

Slide - 58.



Student Content

ATCoach commands can be used to modify altitude, speed and heading changes.

For Altitudes, add one of the following immediately after the altitude value:

- Add a + for expedited climb/descent rate
- Add a – for reduced climb/descent rate
- Add a PD for Pilot's Discretion
- Add a ~ character and a desired rate in feet per minute (must be 4 digits)

For an Altitude Crossing restriction use the ARA command, immediately followed by the crossing restriction location, immediately followed by a ~ and the desired restriction altitude.

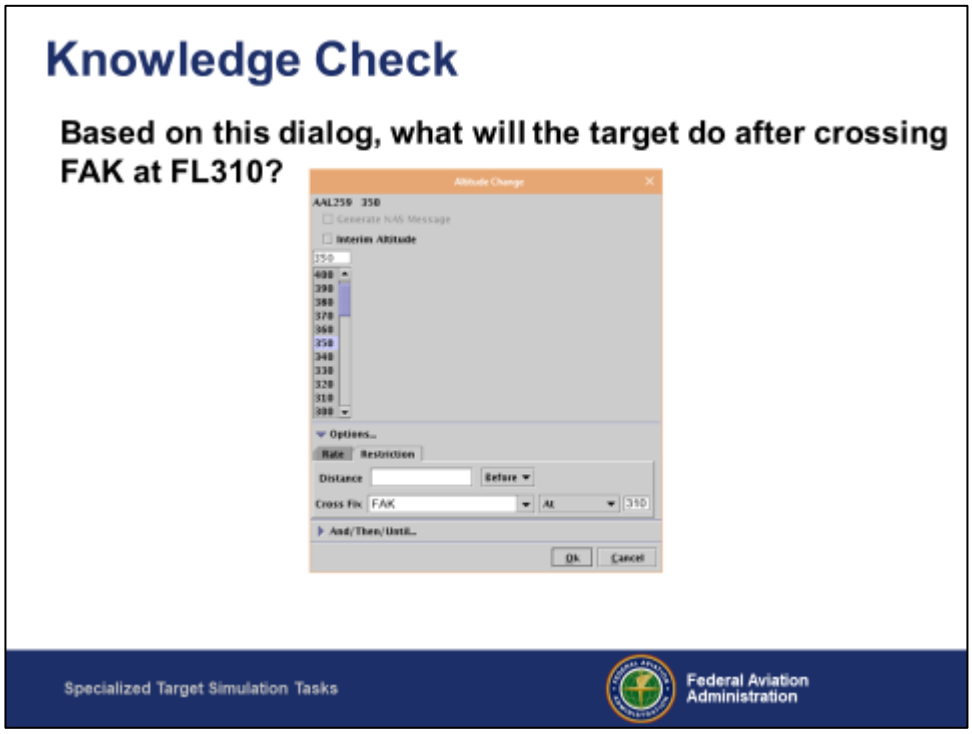
For a speed change rate, add a ~ and the desired rate immediately after the new speed.

For Headings, add one of the following immediately after the desired heading:

- Add a + for expedited turn rate
- Add a – for half-standard turn rate

Remember, ATCoach target control commands are fully described in the Runtime Control Commands manual.

Slide - 59.

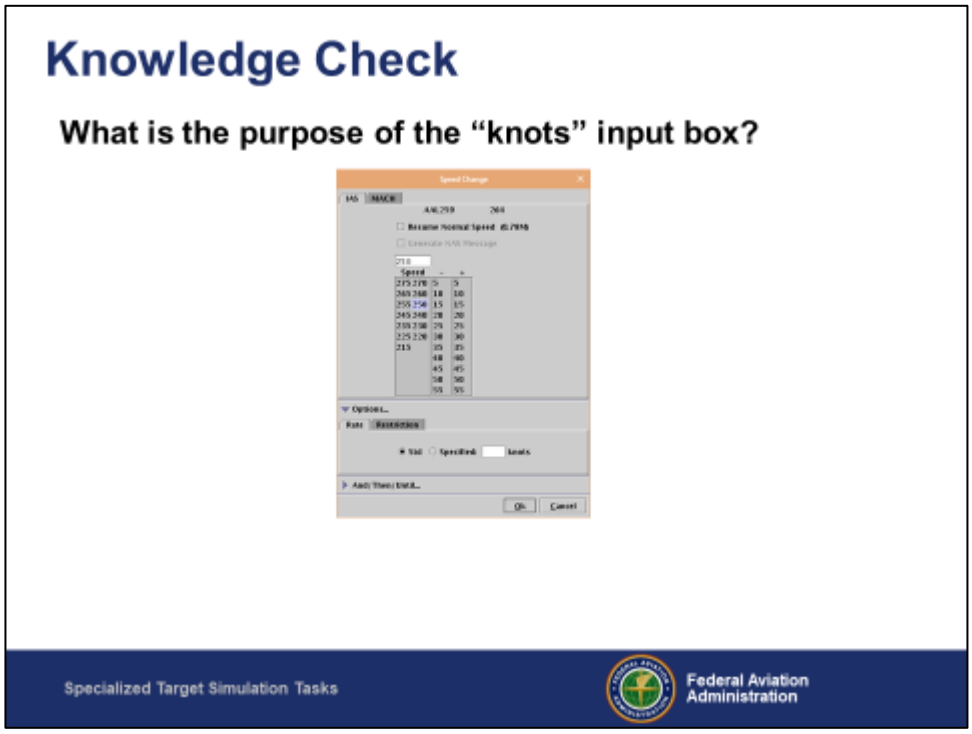


Instructor Notes

For all Knowledge Check questions, once a student has answered, click once to reveal the answer.

Answer: Climb to FL350.

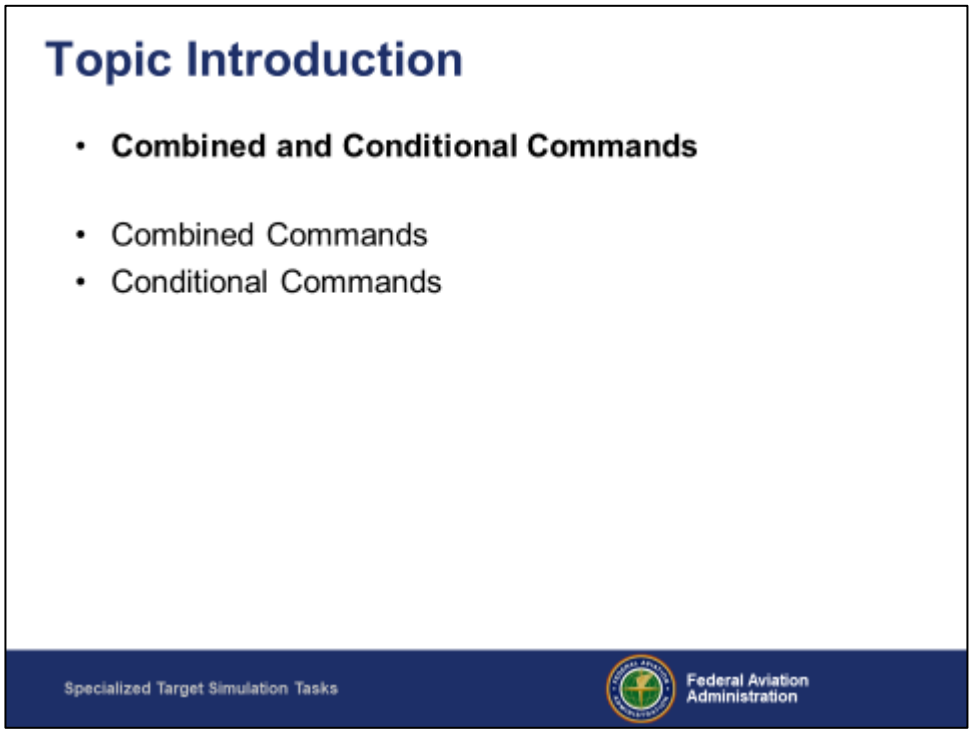
Slide - 60.



Instructor Notes

Answer: Specify the Acceleration/Deceleration rate in knots per minute.

Slide - 61.

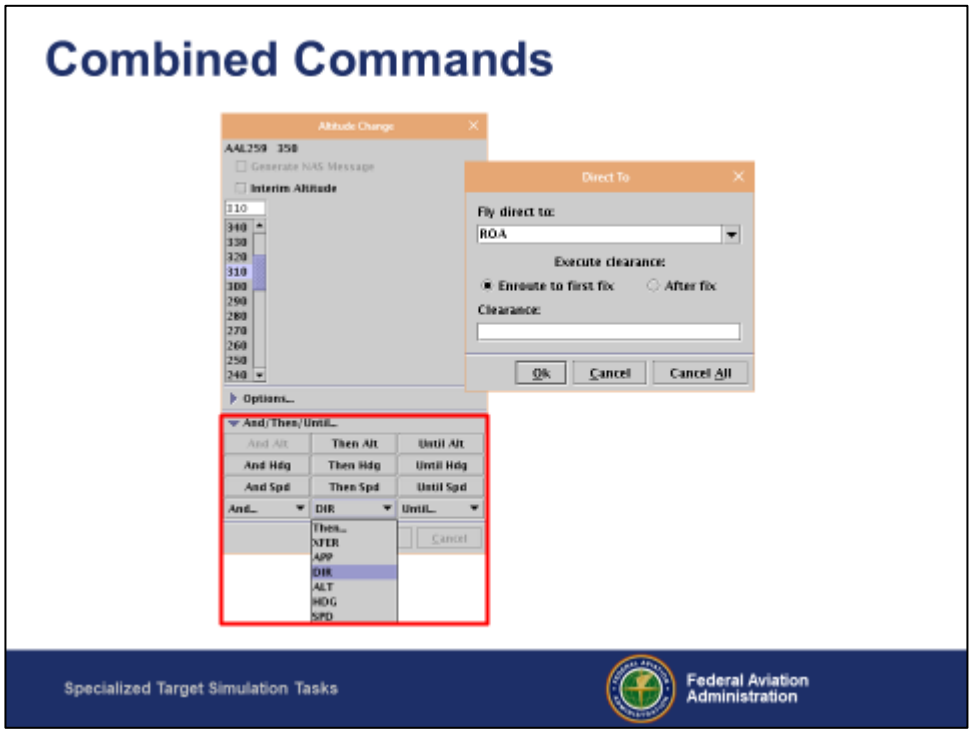


Student Content

ATPilot provides options for combining ATCoach commands so they are executed simultaneously, or sequentially. These are called combined commands.

There are also options for making a command execute after some condition is met. These are called conditional commands.

Slide - 62.



Student Content

The **And/Then/Until…** expansion area in many of the target control dialogs is used to enter combined commands. To do so, assuming the desired dialog is already open:

1. Make the first target control change as previously described, but do not execute.
2. Click the **And/Then/Until…** button to display the panel.
3. Click on the second command type button (e.g., Alt, Hdg, Spd) in either the And, Then or Until column to open the appropriate command type dialog.
   - An And command causes the target to execute both commands simultaneously.
   - A Then command causes the target to execute the first command, and when that maneuver is complete, execute the second command.
   - An Until command opens the Conditional Command dialog.
4. After the appropriate dialog appears, enter the second target control choice as previously described.
5. Click **Ok**.

In the example presented, the target will descend to FL310, and then proceed direct ROA.

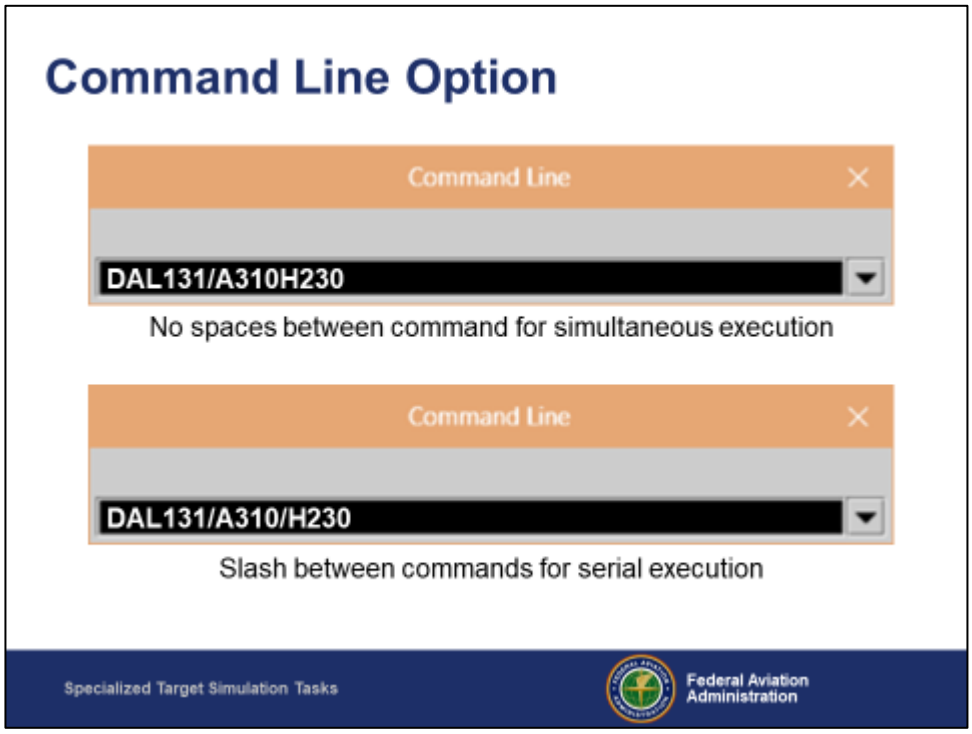
Since most target control changes are to altitude, heading, and speed, there are individual buttons for these dialogs.

The fourth button in the And and Then columns opens a pull-down menu that provides access to the following additional dialogs:

- XFER Transfer dialog used to transfer a target to another Ghost Pilot
- APP Approach dialog
- DIR Direct To dialog

All buttons in the Until column open the Conditional Command dialog. We will cover that dialog later in this lesson.

Slide - 63.



Student Content

Combined commands can also be entered using the command line. The commands can be executed simultaneously or in series.

To do so:

1. Type the desired commands consecutively, with no spaces between them for simultaneous execution.

   or

   Type the desired commands consecutively, with forward slashes (/) between them for serial execution.

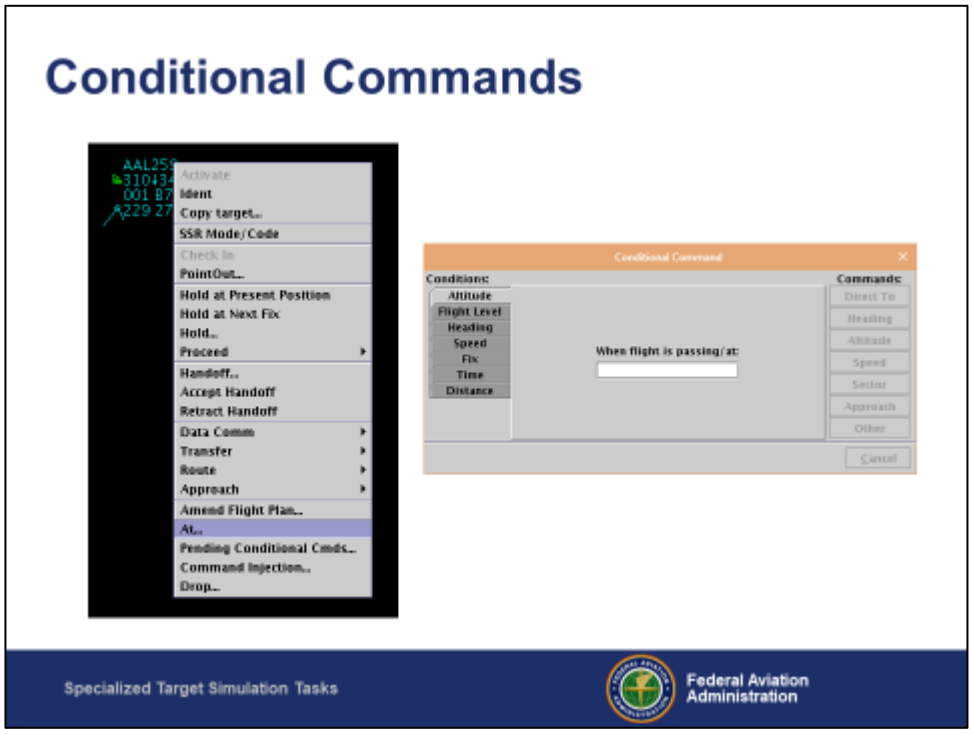
2. Press Enter.

In the top example, DAL131 will climb/descend to FL310 and turn to a 230 heading simultaneously.

In the bottom example, DAL131 will climb/descend to FL310 then, after reaching FL310, turn to a 230 heading.

Only Altitude (A), Heading (H), Speed (V), Pilot Transfer (T), Approach (Z), Conditional (When), and Proceed (P or PF) commands can be combined. The first four can be in any order. Only one of the last three can be used in combination and it must be the last command.

Slide - 64.

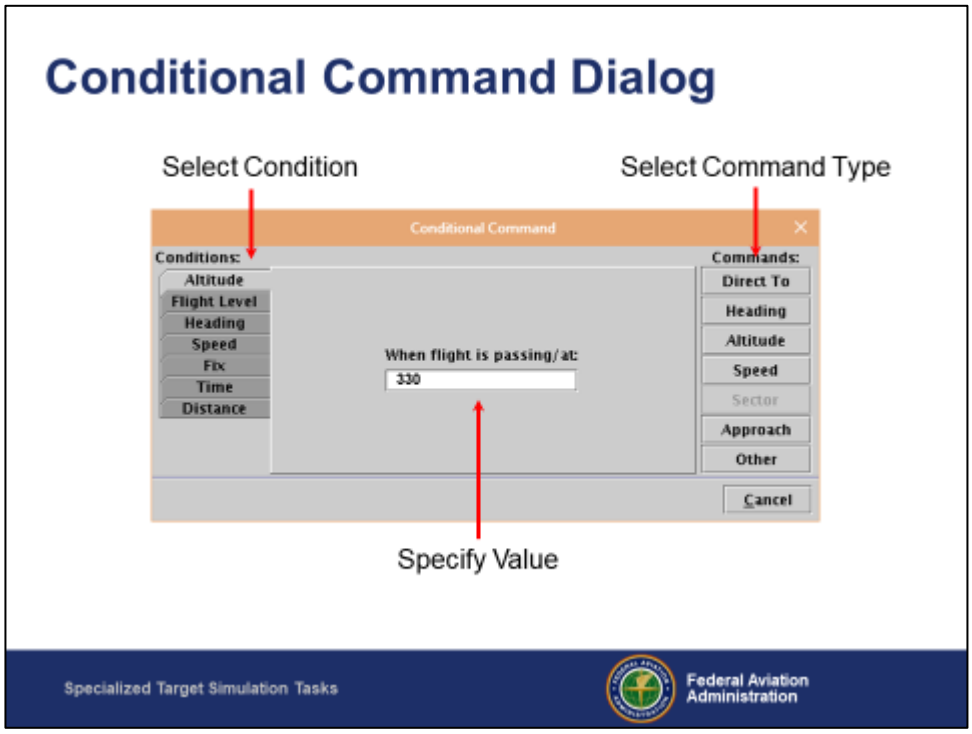


Student Content

The Conditional Command dialog is used to enter a command that will be executed after a specified condition is satisfied.

The dialog is accessed by selecting the **At…** option on the Target Control menu or the **Until** button on the Altitude Change, Speed Change, and Heading Change dialogs.

Slide - 65.

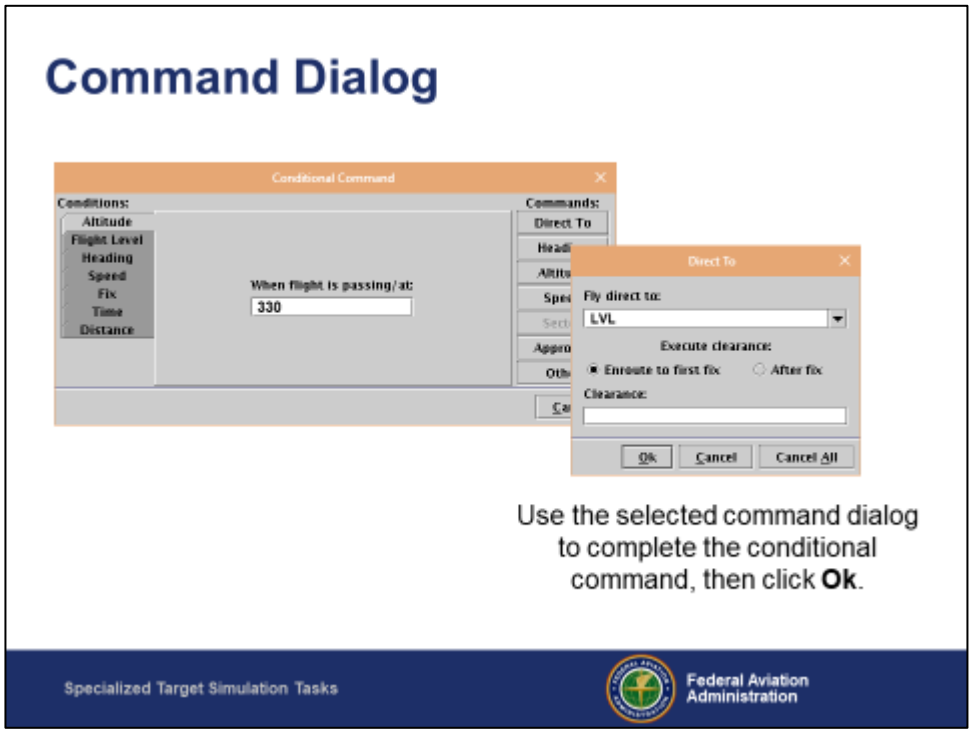


Student Content

The Conditional Command dialog has three components:

- A set of tabs on the left side used to select the desired condition type.
- A panel in the middle used to enter the condition value. The panel is specific to the selected condition type.
- A set of buttons on the right side used to select the command type.
    - When one of these buttons is selected, the corresponding dialog will open. These are the same dialogs already covered (e.g., Altitude Change, Heading Change, etc.).
        - The **Other** button opens the Command Line view.
    - Grayed out buttons are not selectable.

Slide - 66.



Student Content

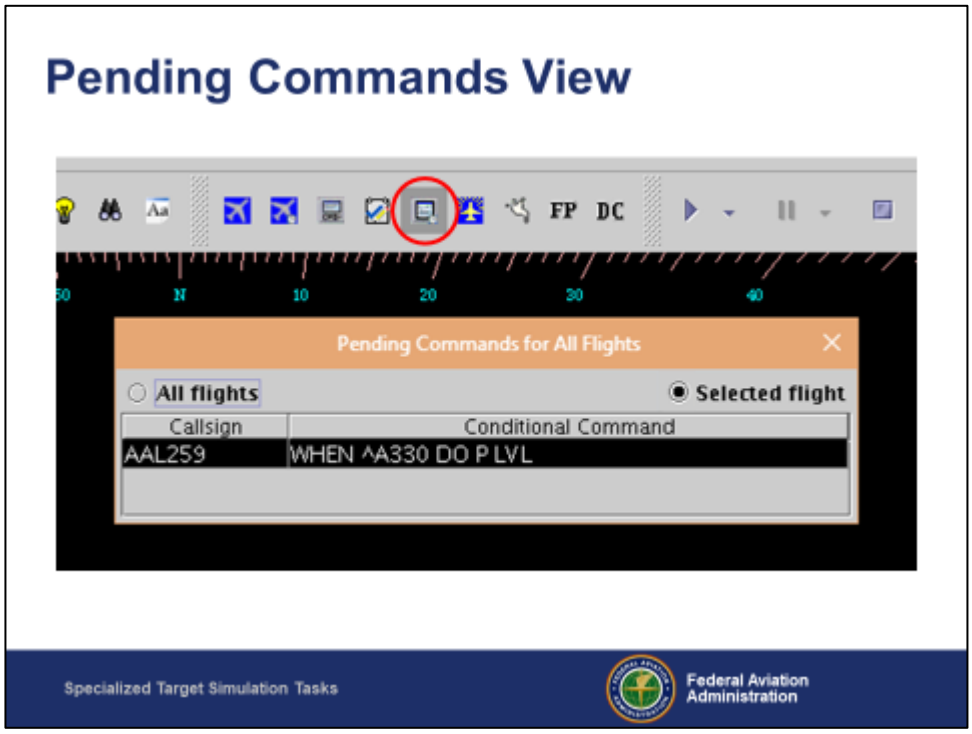
In this example, as soon as the target passes (either climbing or descending) or is level at FL330 the target will proceed direct LVL.

To execute the command, click on **Ok** in the Direct To dialog. A conditional command is entered using the **Ok** button on whichever dialog was selected.

The **Cancel All** button cancels the entire conditional command creation process and closes both the selected dialog and the Conditional Command dialog.

The **Cancel** button just closes the selected dialog. The Conditional Command dialog remains open.

Slide - 67.



Student Content

The Pending Commands view displays all conditional commands awaiting execution.

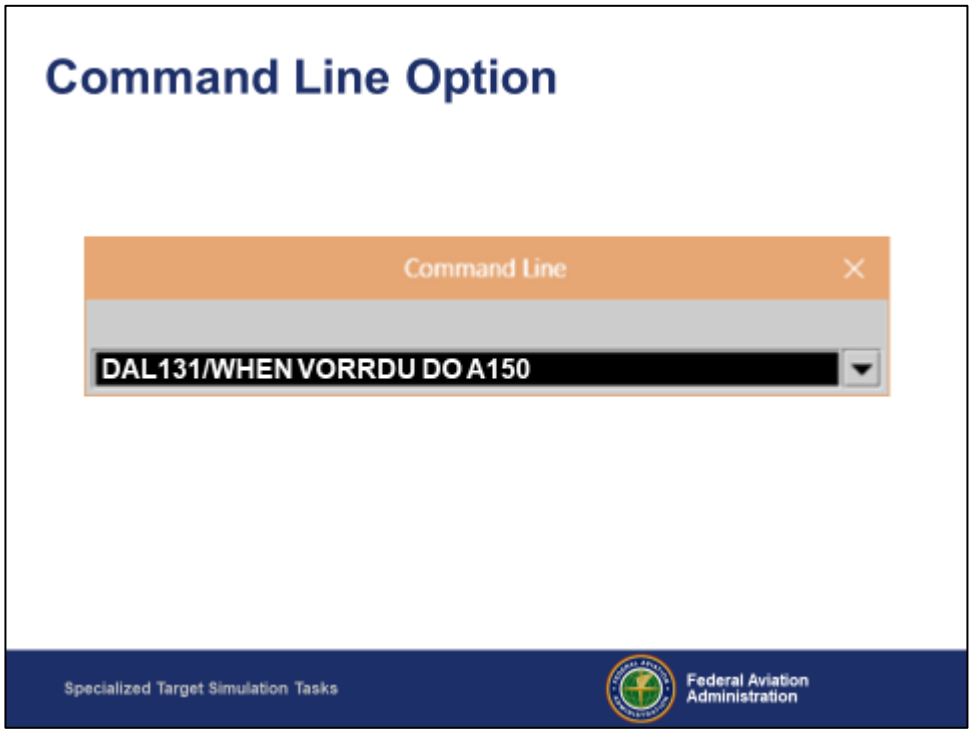
The view is accessed by selecting the Pending Commands icon on the Views toolbar.

The view has two radio buttons:

- **All flights** - lists all pending conditional commands in the scenario.
- **Selected flight** - only lists pending conditional commands for the currently selected target.

Right-click on any entry to display a pop-up menu with options to delete the entry or delete all entries. Deleting an entry cancels the command.

Slide - 68.



Student Content

Conditional commands can be manually entered in the command line.

The command syntax is: WHEN <condition> DO <ATCoach command>

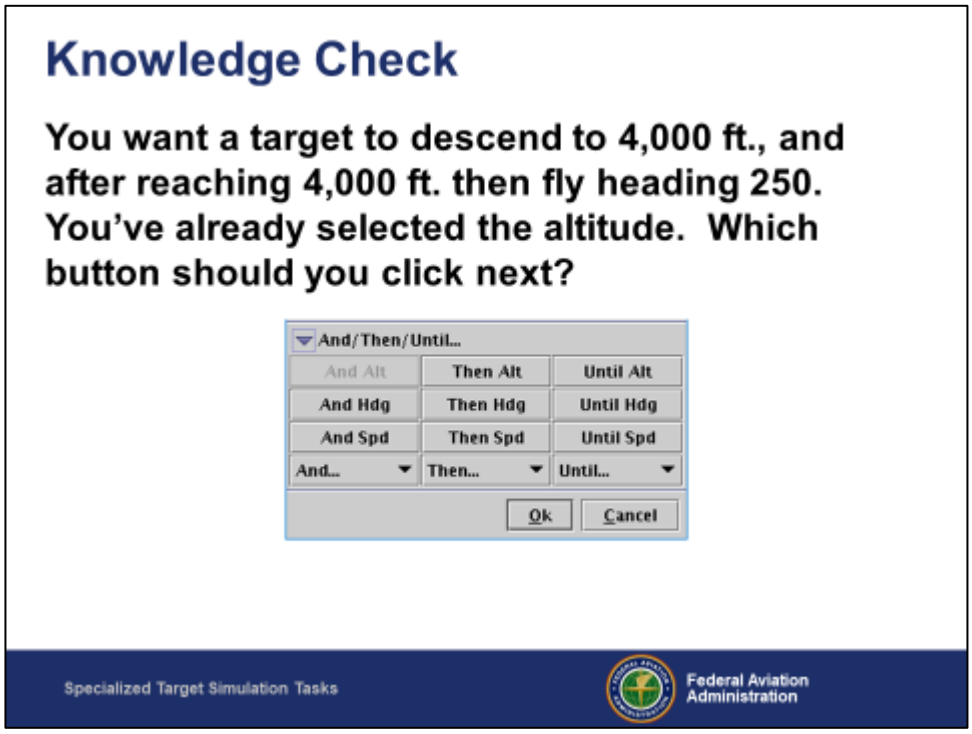
Each condition includes one of 20 special condition codes and a corresponding condition value.

In this example, the condition code is VOR, which stands for “VOR crossed”, the condition value is RDU, and the ATCoach command is an Altitude Change to 15,000 ft.

- When the target reaches the RDU VOR it will begin an altitude change to 15,000 ft.

The condition codes and appropriate values are fully described in the Runtime Control Commands manual.

Slide - 69.

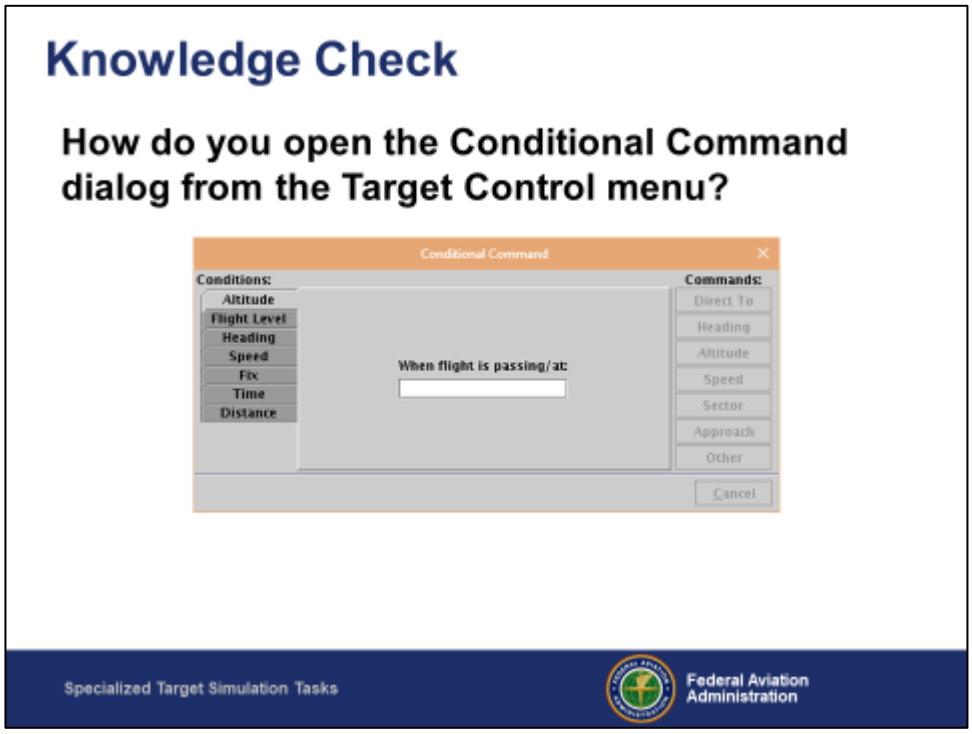


Instructor Notes

For all Knowledge Check questions, once a student has answered, click once to reveal the answer.

*Answer: The **Then Hdg** button.*

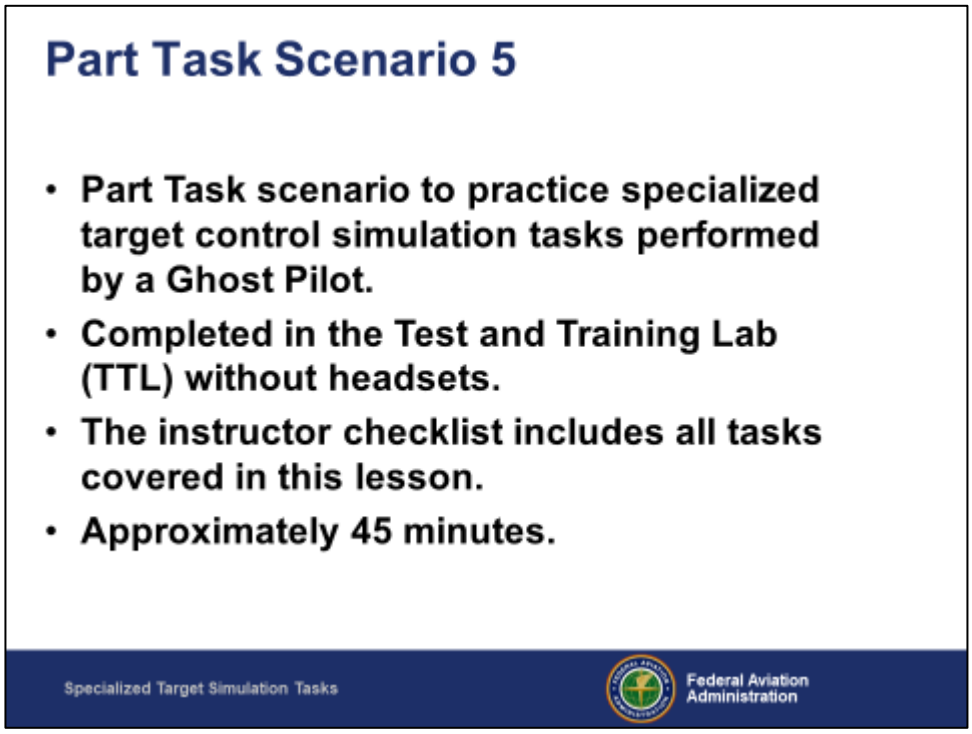
Slide - 70.



Instructor Notes

*Answer: Select the **At…** option.*

Slide - 71.

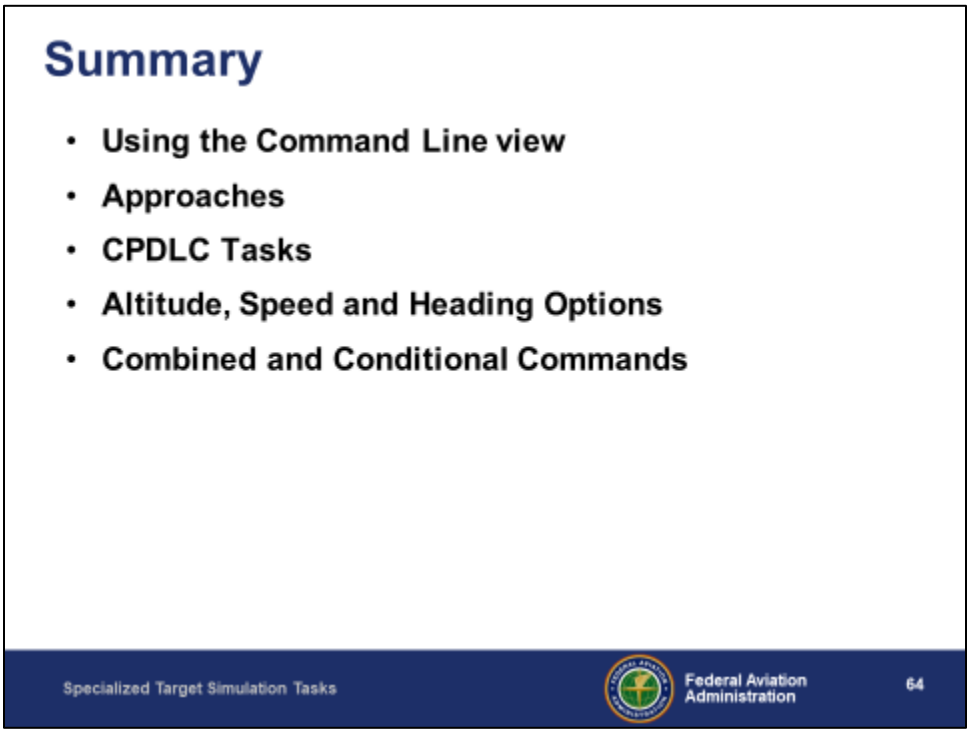


After completion of this exercise, this lesson will resume in the classroom. Your instructor will provide the details.

Part Task Scenario 5:

Purpose	To practice all specialized target control tasks performed by a Ghost Pilot.
Materials	The instructor will use the Part Task Scenario 5 checklist. Students should be given the Ghost Pilot Course Quick Reference Card.
Directions	A locally developed scenario should be loaded and ready to start in the TTL. Requirements for the scenario have been provided to the facility. No controllers are needed. No headsets are needed. Instructors should use the checklist to step through all the functionality to be practiced. Instructors should assist students as necessary. Students should check-in and accept handoffs from the training sector without direction from the instructor. Approximate duration of the exercise is 45 minutes.

Slide - 72.



Instructor Notes

Review the main topics covered in the lesson. Ask participants if they have any questions.

Slide - 73.


THE END
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Federal Aviation Administration
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