



**Federal Aviation
Administration**

En Route ERAM Ghost Pilot (GP) Training

Lesson 5: Specialized Target Simulation Tasks

Course FAA55149002

Version: V.2019-05

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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.

***En Route ERAM Ghost
Pilot (GP) Training***

**Lesson 5
Specialized Target
Simulation Tasks**

Course FAA55149002

05/2019



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Slide - 2.

Lesson 5 Objective

Given a Ghost Pilot Workstation and associated resources, the student will perform specialized target simulation tasks in accordance with TI 6110.106, TI 6110.154, and ATPilot reference documentation.

Specialized Target Simulation Tasks



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Slide - 3.

Lesson 5 Topics

- **Using the Command Line view**
- **Approaches**
- **CPDLC Tasks**
- **Altitude, Speed, and Heading Options**
- **Combined and Conditional Commands**

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Slide - 4.

Topic Introduction

Using the Command Line view

- Command Line Features
- Selected ATCoach commands



The screenshot shows a window titled 'Command Line' with a close button (X) in the top right corner. Below the title bar is a grey rectangular area containing a black input field with the text 'DAL377/A270' and a small downward arrow on the right side.

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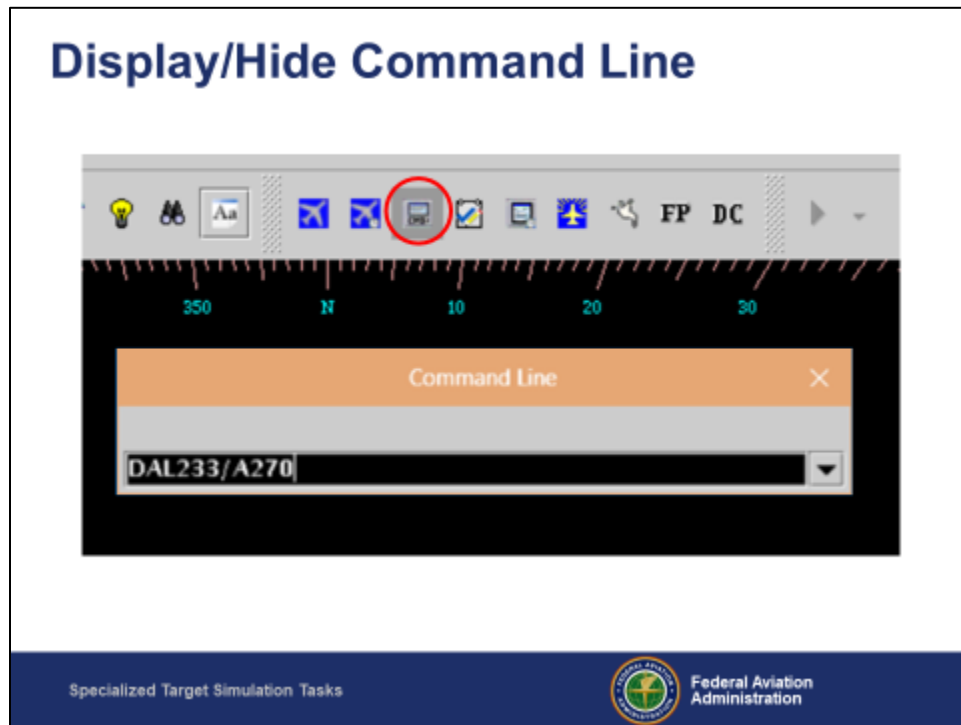
Some Ghost Pilots prefer to bypass the ATPilot Graphical User Interface (GUI) and manually enter the required ATCoach command instead. There are also certain ATCoach commands that do not have a GUI option.

The Command Line view is used to make these entries.

In this section, we will:

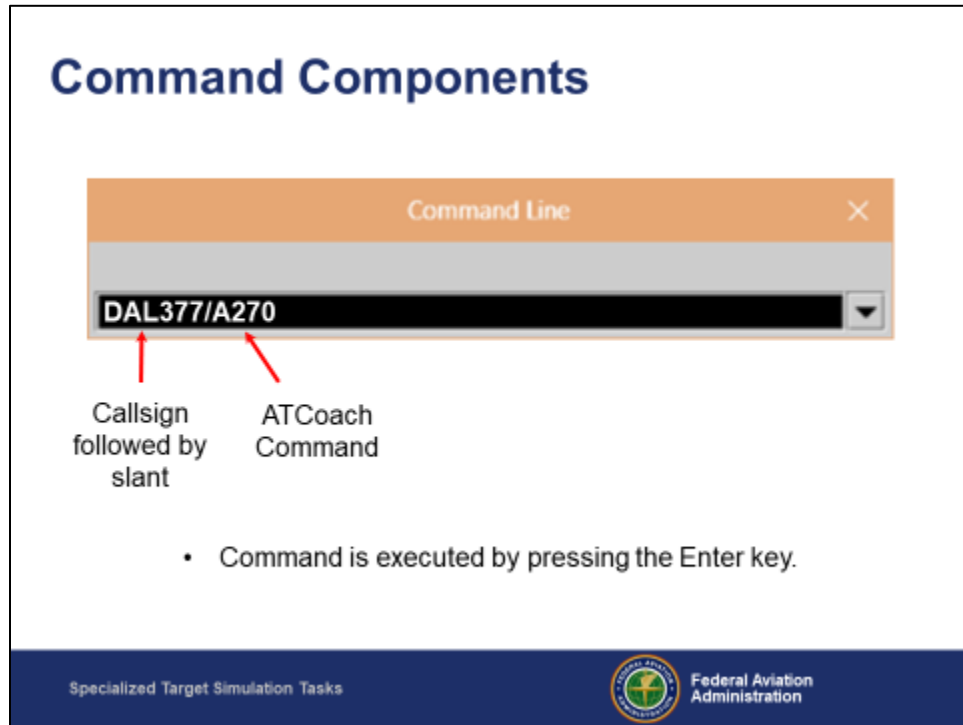
- Describe the Command Line view features.
- Introduce selected ATCoach commands.

Slide - 5.



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

Slide - 6.



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

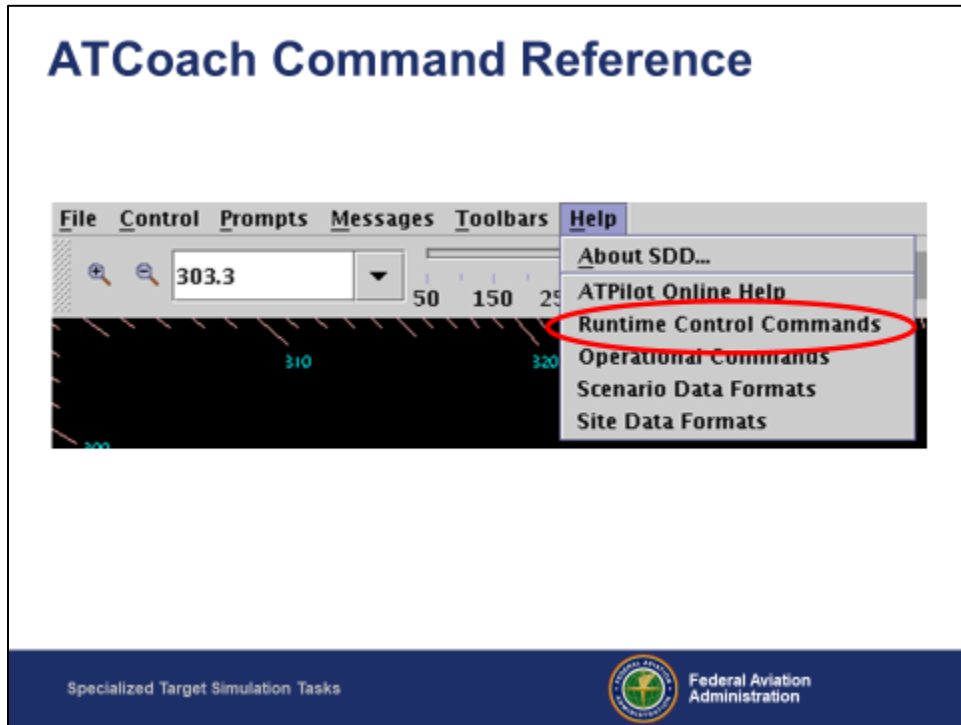
- The callsign and forward slant can quickly be added by selecting the desired target (i.e., click on the target).

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.

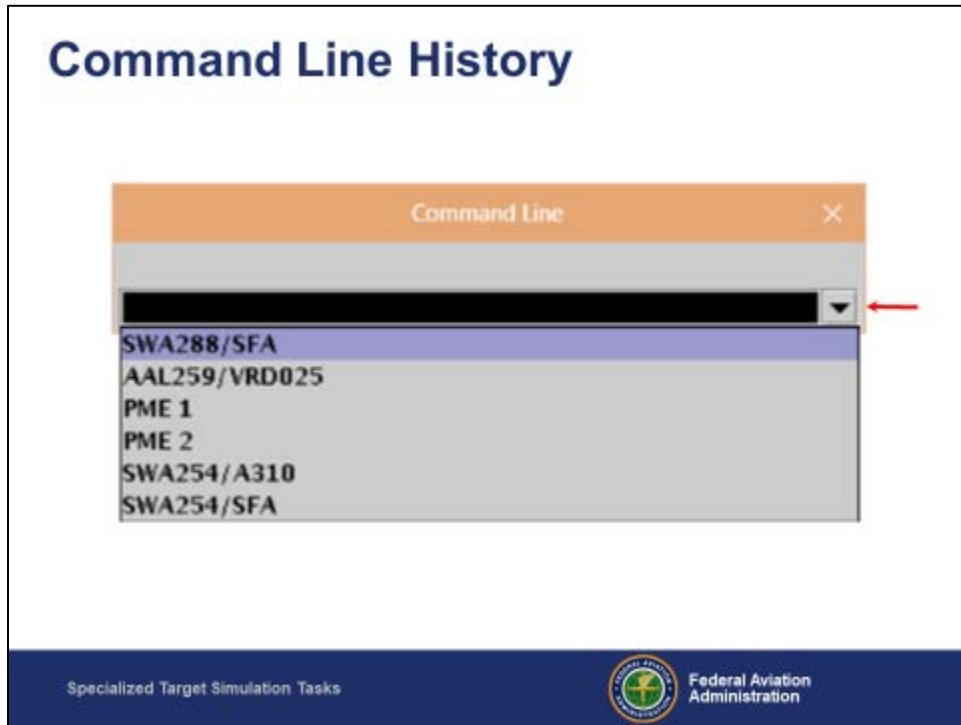


ATCoach command documentation is available under the Help menu.

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.



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.

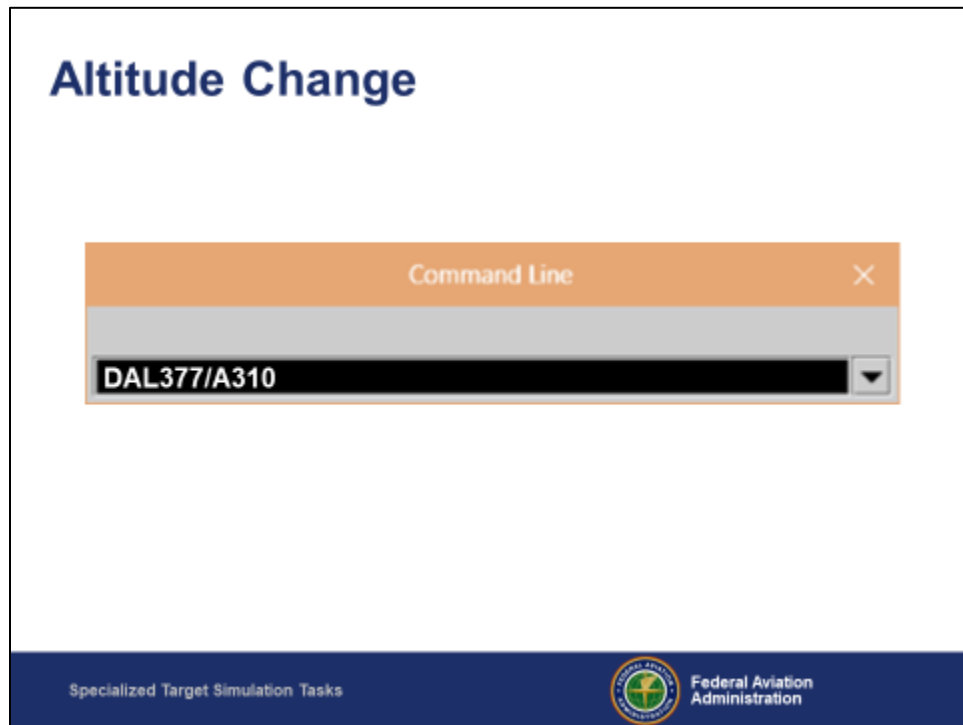
- If a callsign is in the command line, the Command History is only for that aircraft.
- If no callsign is in the command line, the Command History is for all aircraft.

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.

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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.

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Speed Change

Command Line

DAL377/V300

- 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

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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.

Heading Change



The screenshot shows a 'Command Line' window with a close button (X) in the top right corner. The text 'DAL377/H180' is entered in the command line. Below the command line is a list of commands:

- 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

At the bottom of the slide, there is a blue footer bar containing the text 'Specialized Target Simulation Tasks' on the left, the Federal Aviation Administration logo in the center, and 'Federal Aviation Administration' on the right.

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.

Canceling a Command



The screenshot shows a window titled "Command Line" with a close button (X) in the top right corner. Below the title bar is a text input field containing the command "DAL377/Q". A dropdown arrow is visible on the right side of the input field.

- The target stops maneuvering at the point the command is canceled.

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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.

Force a Command



- Will cause the target to execute the command instantly.
- Should only be used to correct a Ghost Pilot error.

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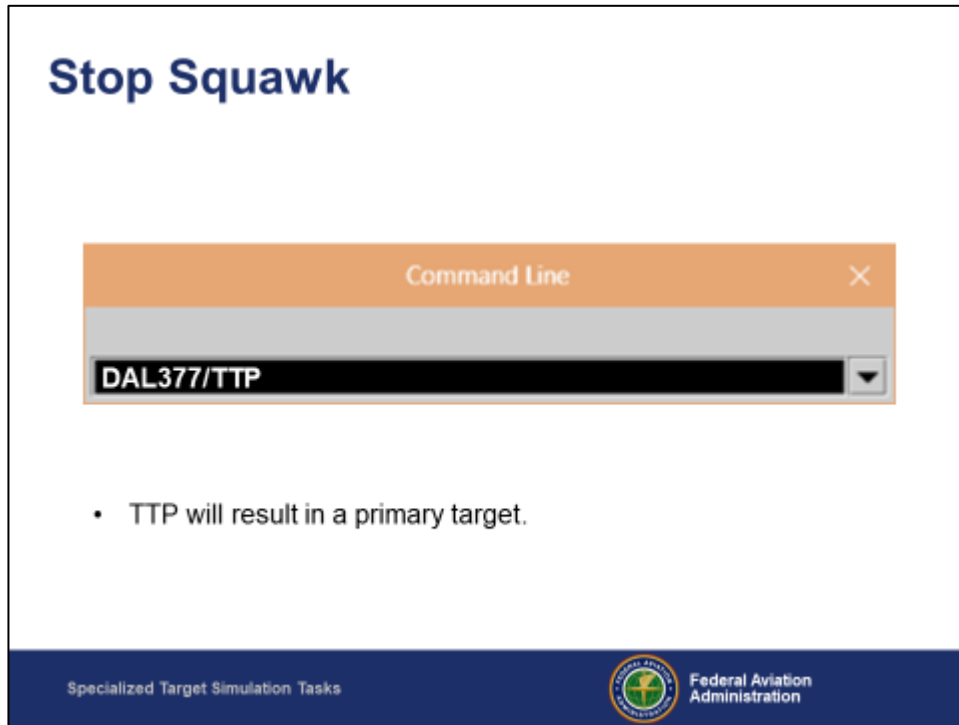
The Force (F) command, appended to any other ATCoach command, will cause the target to perform the maneuver immediately. Note that there is no space between the ATCoach command and the F.

- 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.

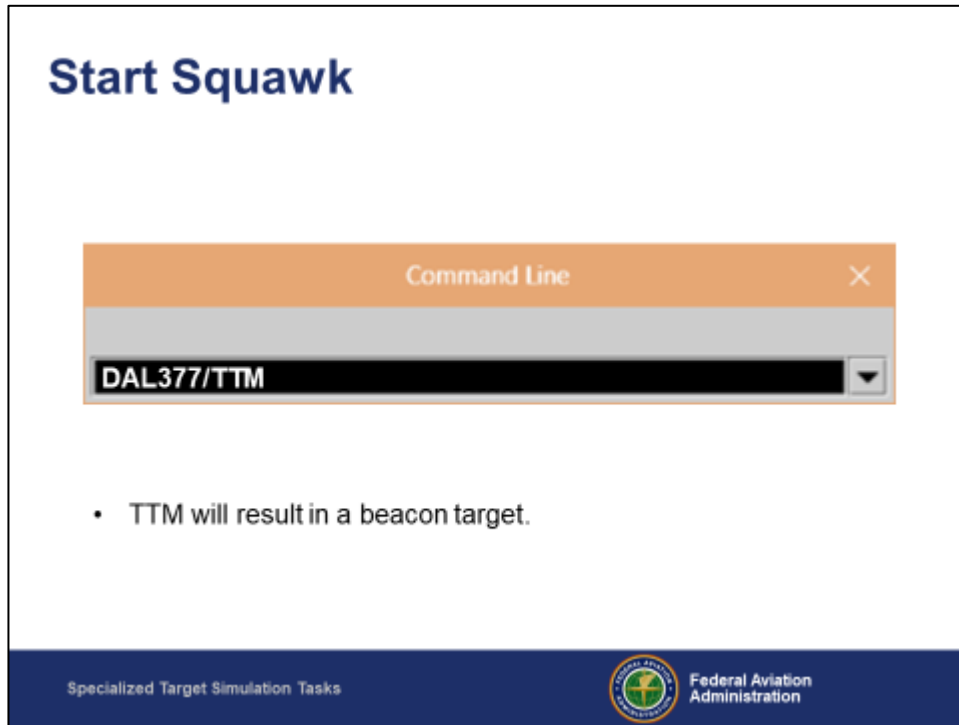


The command TTP (Target Type Primary) results in a target with a Mode A transponder that is disabled. Only primary target radar data is then sent to ERAM, meaning a primary target is displayed at the R-position.

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.



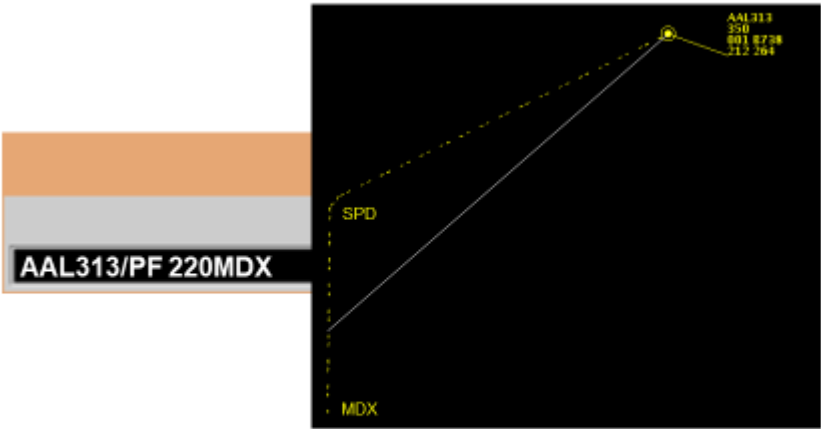
The TTM (Target Type Merged) command re-enables the Mode A transponder for a target, if so equipped. If the transponder is enabled, simulated beacon radar data will be sent to ERAM and a beacon target will be displayed at the R-position.

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.

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Fly Heading Until Rejoining Route



- The heading must intersect a point on the route before the specified fix.
- The fix must be on the target's route.

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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.).

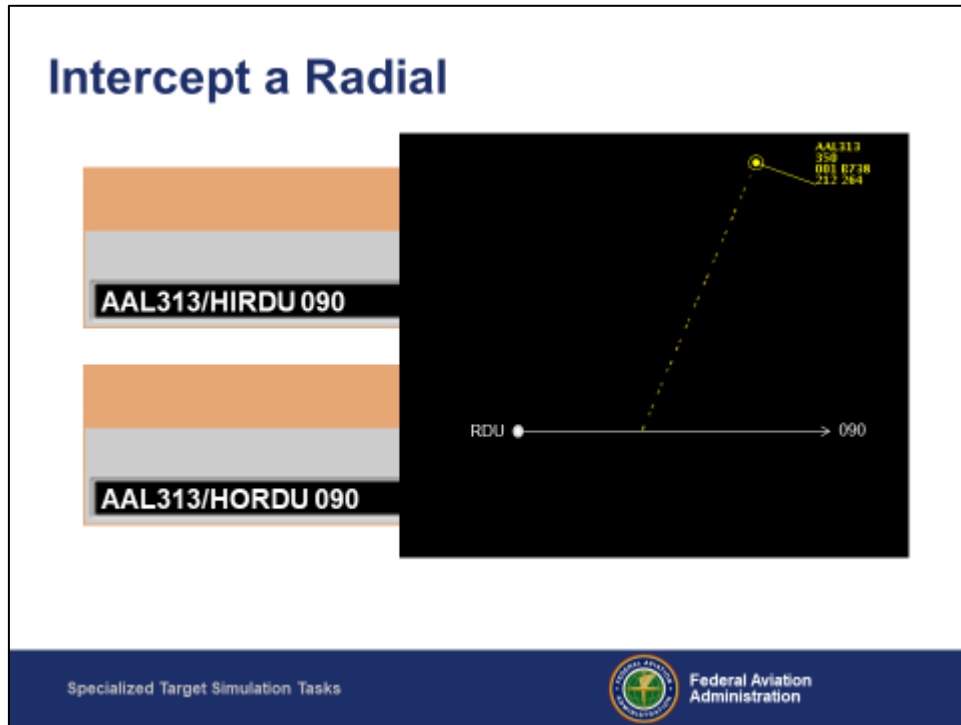
The command syntax is PF, a space, the assigned heading followed immediately by the desired fix (i.e. no space between the heading and fix).

- 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.



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.

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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.

Break a Formation

Command Line

EAGLE2/BF

Command Line

EAGLE2/B4231

- Target will be a primary only.
- Start squawking and assign correct beacon code.

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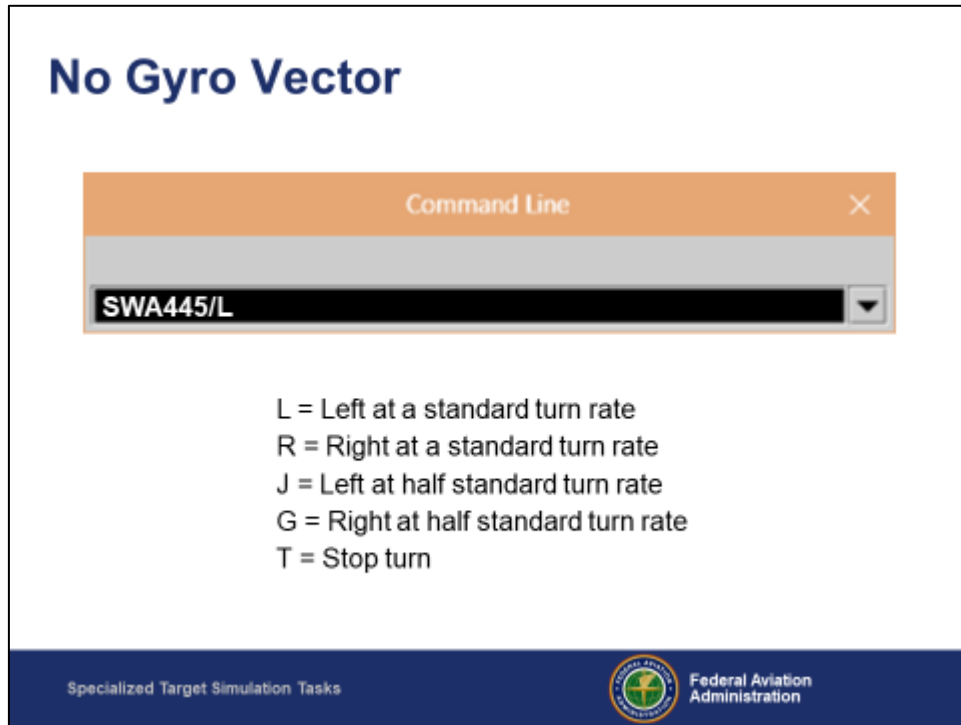
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The BF (Break Formation) command is used to cause a target to break from a formation. The command syntax is BF.

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

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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.

Knowledge Check

Where do you click to display the Command History?



The screenshot shows a window titled 'Command Line' with a close button (X) in the top right corner. Below the title bar is a light gray area, and at the bottom is a black text input field with a small downward-pointing arrow on its right side, indicating a dropdown menu.

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Knowledge Check

Which Menu bar option provides access to the ATPilot Runtime Control Commands reference document?

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Knowledge Check

DAL123 is currently at FL246 as it descends from FL250 to FL230. The command DAL123/Q is entered. What will happen to the target?

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Topic Introduction

Approaches

- Defined Approach Options
 - Grant Clearance
 - Join Localizer
 - Missed Approach
 - Go Around
- Route Change Option

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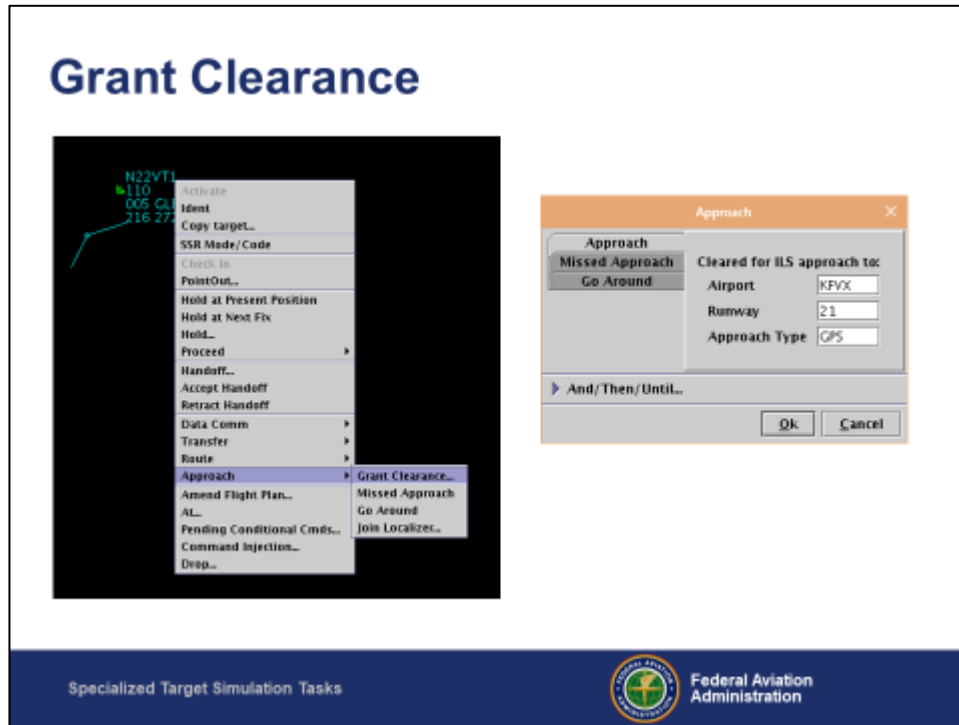
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Scenario developers can create flight paths to simulate approaches. The paths include a set of fixes with altitude/speed changes at the appropriate fixes. There are two methods for doing so:

- Defined Approach
 - o 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
 - o 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.

Slide - 25.



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**.

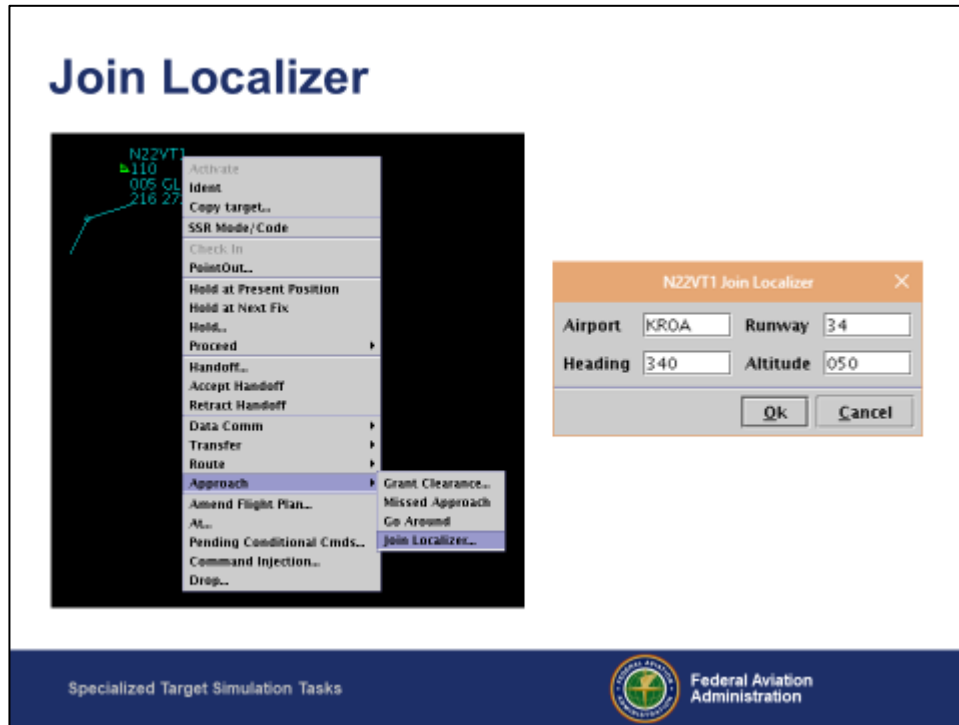
Depending on the clearance, an Altitude Change command may need to be entered prior to executing the approach.

- 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.



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

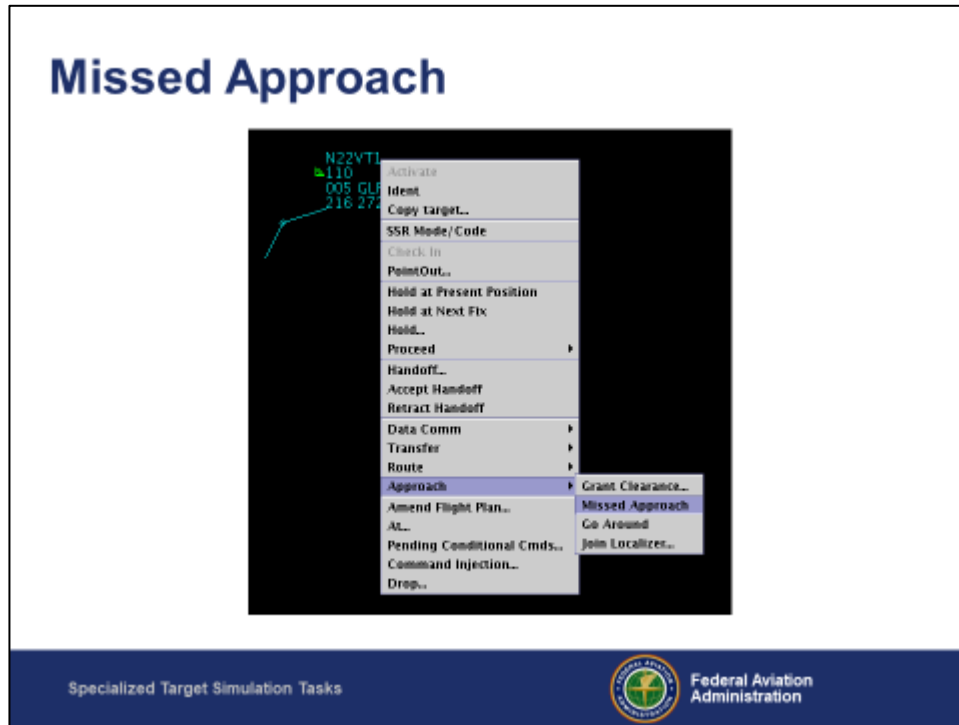
1. Select the **Join Localizer...** option. The Join Localizer dialog will open.
2. Enter the Airport Identifier (the K is required).
3. Enter the runway number.
4. Enter the desired heading.
5. If desired, enter an altitude to descend to prior to executing the approach.

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.



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.

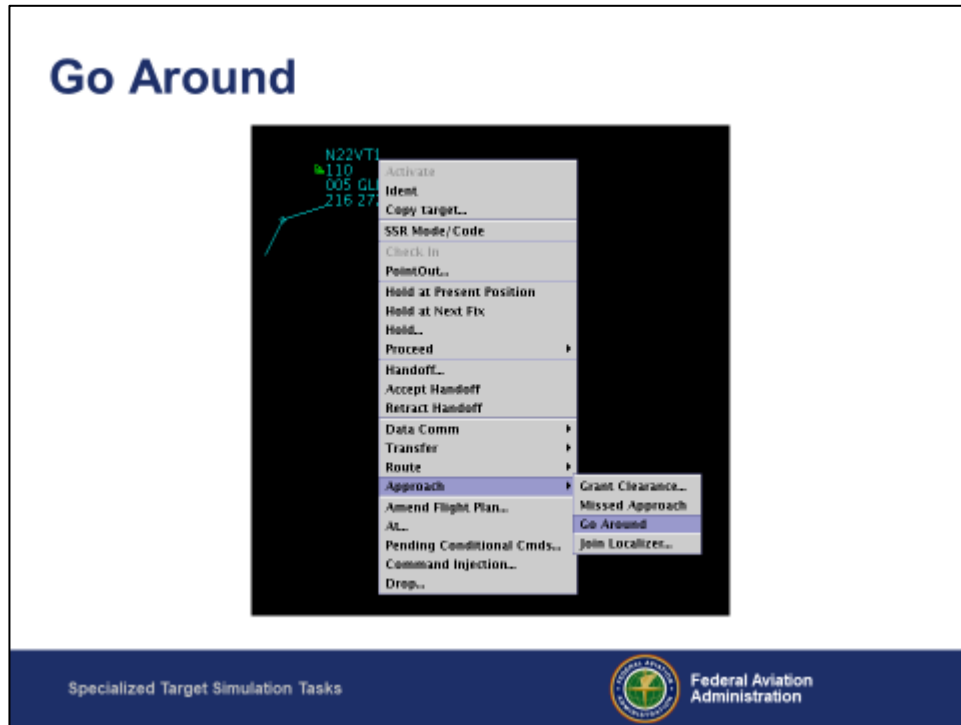
To do so:

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.



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.

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Command Line Alternatives

Command Line DAL377/ZKMCO17R	Approach (default is ILS)
Command Line N123/ZKPGW19/DME	Approach (DME example)
Command Line DAL377/JLOKMC017R 190 040	Join Localizer
Command Line DAL377/IM	Missed Approach
Command Line N123/GA	Go Around

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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.

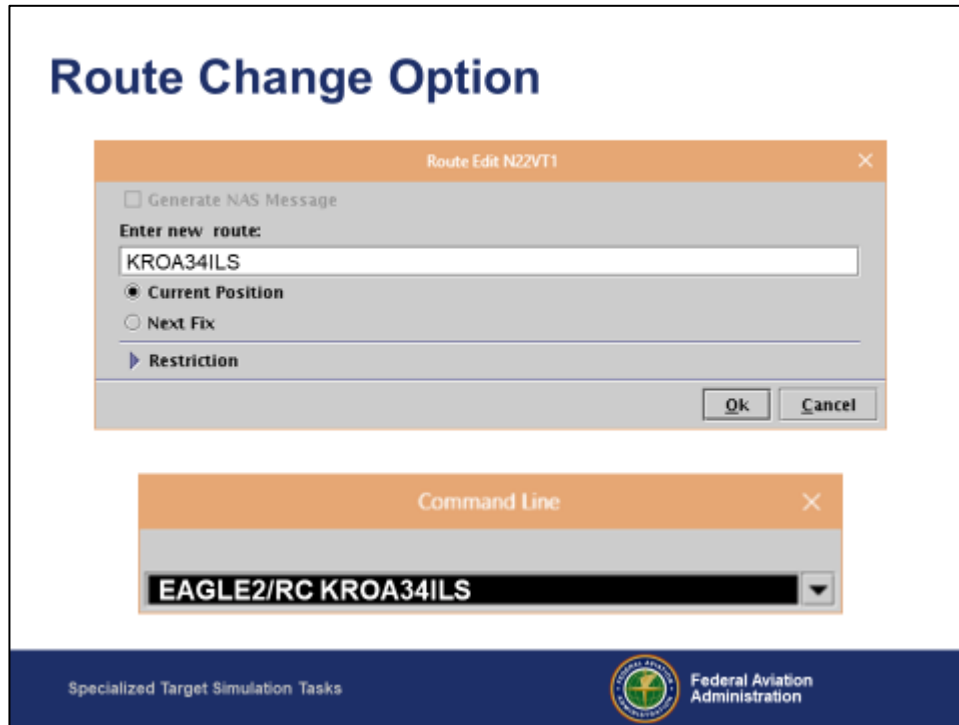
The Join Localizer command (JLO) is used to intercept a localizer and execute the approach. The JLO command is followed by the following fields:

- 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.



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.

Knowledge Check

What are the reasons ATCoach will reject an otherwise valid ILS clearance?

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Slide - 32.

Knowledge Check

What are the two options for executing an approach in ATPilot?

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Slide - 33.

Topic Introduction

CPDLC Tasks

- Manually Responding to Uplinks
- Logon
- Terminate Session
- Disable CPDLC

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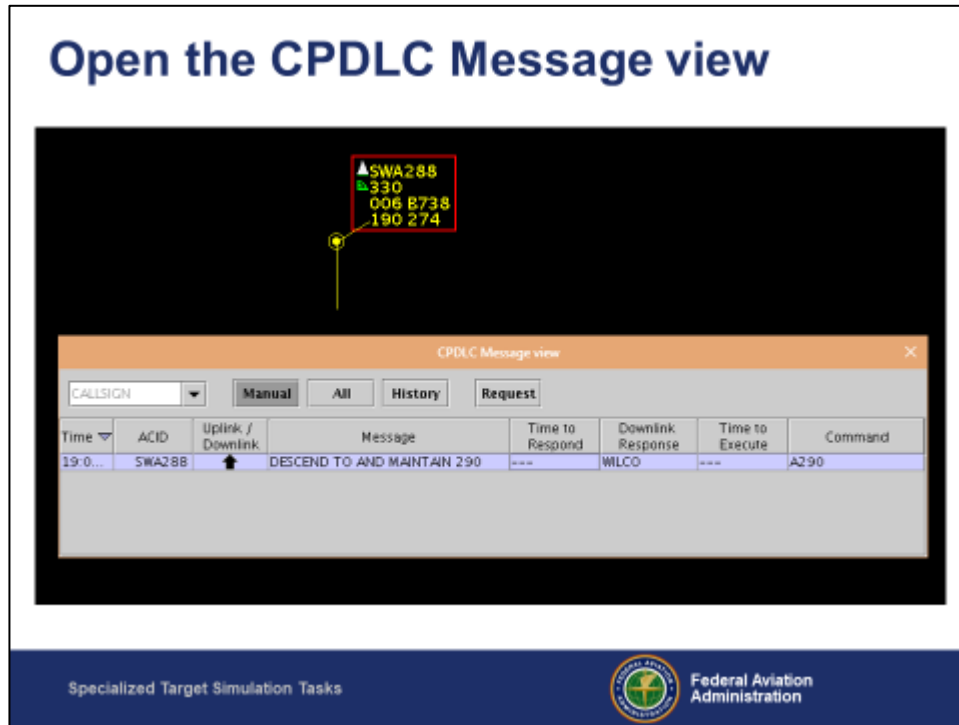
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In previous lessons, we introduced CPDLC, described the CPDLC Message view contents, how to send Pilot Initiated Downlinks (PIDs), and CPDLC Automatic Response mode processing.

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.



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.

Response Options

The screenshot shows a window titled "CPDLC Message view" with a search bar containing "CALLSON" and tabs for Manual, All, History, and Request. Below is a table with columns: Time, ACID, Uplink / Downlink, Message, Time to Respond, Downlink Response, Time to Execute, and Command. The first row is highlighted in blue and contains the text "DESCEND TO AND MAINTAIN 290". A right-click context menu is open over this row, showing four options: "Send Response + Execute", "Send Response", "Execute", and "Acknowledge/Send to history".

Right-click anywhere on the desired entry to display options.

Click on desired option.

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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:

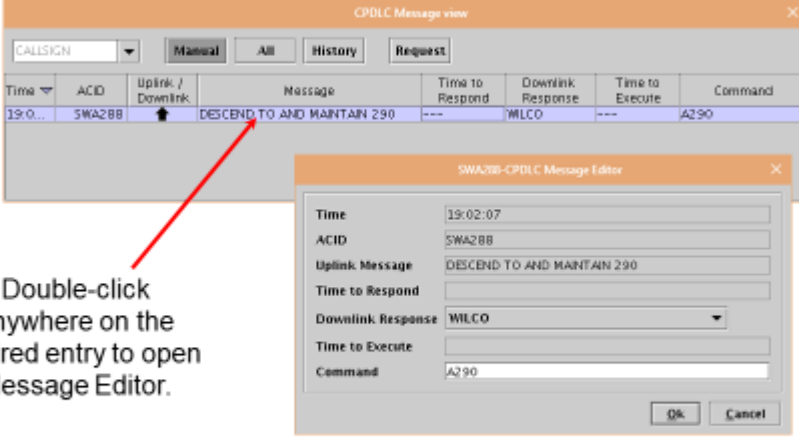
- Send Response + Execute
 - o Immediately sends the response specified in the Downlink Response column.
 - o Starts the Time to Execute timer. Once the timer expires, the command will be executed.
 - o The entry is moved to the History section a few seconds after the command is executed.
 - o This option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

- Send Response
 - o Immediately sends the response specified in the Downlink Response column.
 - o The Time to Execute timer will not begin.
 - o The Uplinked Message will not be moved to the History section.
 - o This option is only available for entries for which no response, other than STANDBY, has been sent.
- Execute
 - o Immediately executes the command in the Command column.
 - o A response downlink will not be sent.
 - o This option is only available for entries with an associated ATCoach command that has not been executed
- Acknowledge/Send to history
 - o Immediately moves the message to the History section regardless of whether a response has been sent or not.
 - o A Downlink Message response will not be sent.
 - o The command will not be executed.
 - o 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.
 - o 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.

Open CPDLC Message Editor



Double-click anywhere on the desired entry to open Message Editor.

Time	ACID	Uplink / Downlink	Message	Time to Respond	Downlink Response	Time to Execute	Command
19:0...	SWA288	↑	DESCEND TO AND MAINTAIN 290	---	WILCO	---	A290

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

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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.

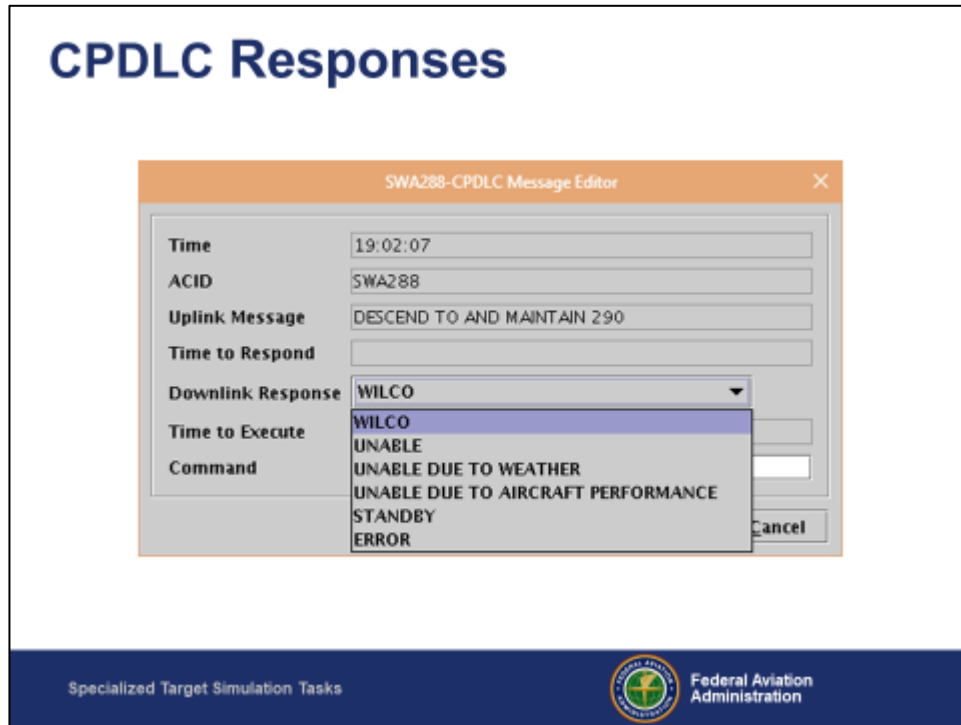
Fields that cannot be edited have a light gray border. Fields that can be edited have a black beveled border.

- 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.



The possible response options to a typical uplink are:

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

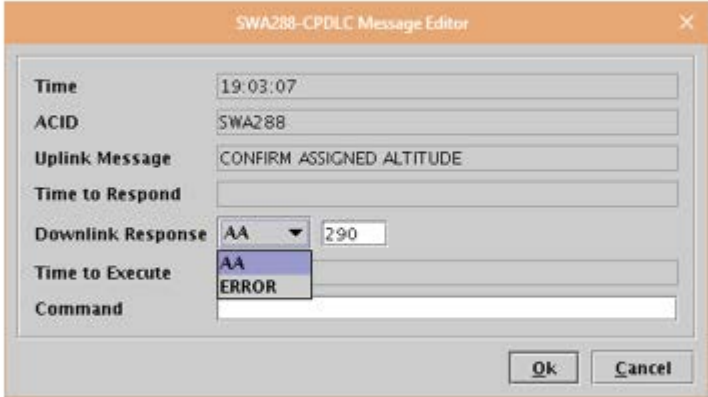
A STANDBY response tells the controller that a further response is forthcoming. When a STANDBY response is sent, the entry will remain in the CPDLC Message view so the final response can be sent later.

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.



The image shows a screenshot of a software interface titled "CPDLC Responses - CAA". Inside this window is a smaller dialog box titled "SWA288-CPDLC Message Editor". The dialog box contains several fields: "Time" with the value "19:03:07", "ACID" with the value "SWA288", "Uplink Message" with the text "CONFIRM ASSIGNED ALTITUDE", "Time to Respond" (empty), "Downlink Response" with a dropdown menu showing "AA" and a text field with "290", "Time to Execute" (empty), and "Command" (empty). The "Downlink Response" dropdown is open, showing "AA" and "ERROR" as options. At the bottom right of the dialog box are "Ok" and "Cancel" buttons. The bottom of the slide features a dark blue banner with the text "Specialized Target Simulation Tasks" on the left, the Federal Aviation Administration logo in the center, and "Federal Aviation Administration" on the right.

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.

Override Automatic Response

Double-click anywhere on the desired entry to open Message Editor.

Edit the RC command and click Ok.

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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.

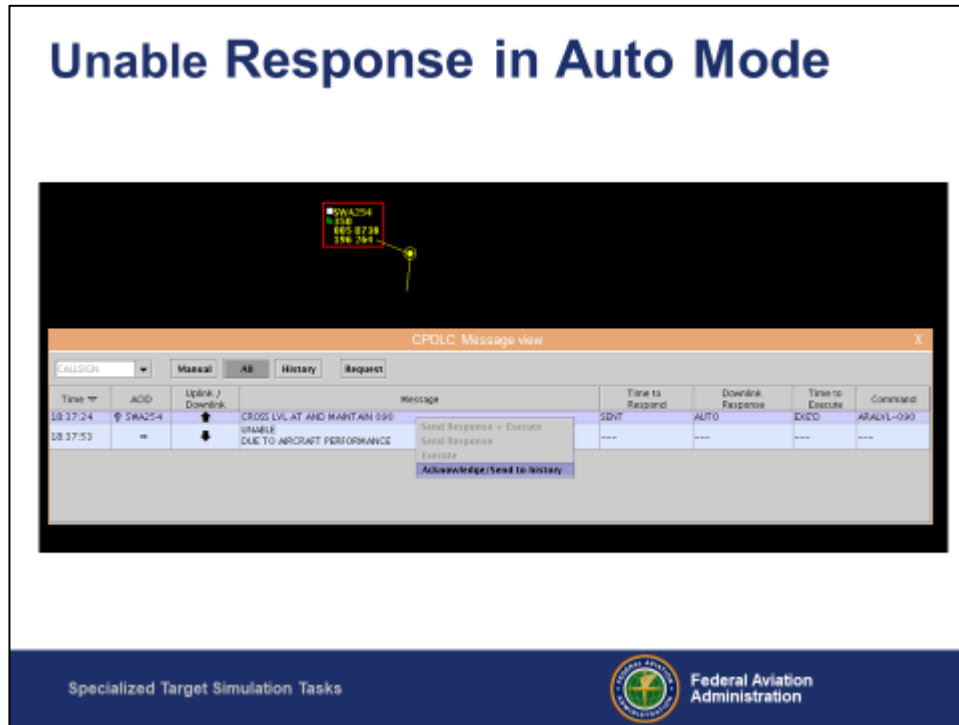
The Ghost Pilots will need to decide if updating the target route is warranted for the training sector and if so, update the route in the Command field of the CPDLC Message Editor.

- 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.



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.

Knowledge Check

How do you execute an ATCoach command shown on the CPDLC Message view without sending a response?

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Slide - 42.

Knowledge Check

**An altitude uplink requires a manual response.
What is the best sequence to do so?**

- A. Send + Execute (simultaneously)**
- B. Send then Execute**
- C. Execute then Send**

Specialized Target Simulation Tasks



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Slide - 43.

Knowledge Check

A target's response mode is set to Manual. You've changed a response from WILCO to UNABLE and clicked OK on the CPDLC Message Editor dialog. Does that send the response?

Specialized Target Simulation Tasks



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Slide - 44.

Knowledge Check

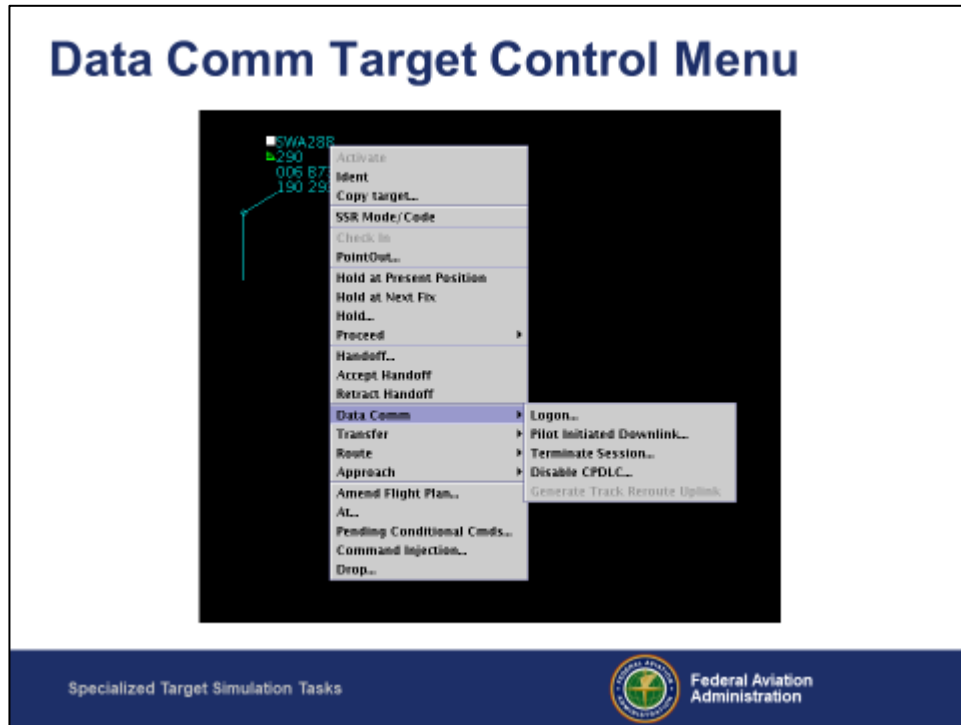
If a route uplink includes a STAR, will Ghost Pilot action be required?

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Slide - 45.



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.

The screenshot shows a dialog box titled "AAL286-Datalink Configuration" with a close button (X) in the top right corner. The dialog has two tabs: "Mode" and "Logon". The "Logon" tab is selected, showing a form with the following fields:

Field	Value
ACID	AAL286
Registration Number	N003AA
ICAO Address	000066
Facility ID	KUSA
ATC Center Address	USADCKA
Location	N380317W770333

At the bottom of the dialog, there is a status bar that reads "LOGON AAL286/N003AA/000066/KUSA/USAC" followed by "Ok" and "Cancel" buttons. Below the dialog box, a message states: "Changes made to the logon information will prevent a session from being established." The bottom of the slide features a dark blue footer with the text "Specialized Target Simulation Tasks" on the left, the Federal Aviation Administration logo in the center, and "Federal Aviation Administration" on the right.

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

- Logon
- Mode

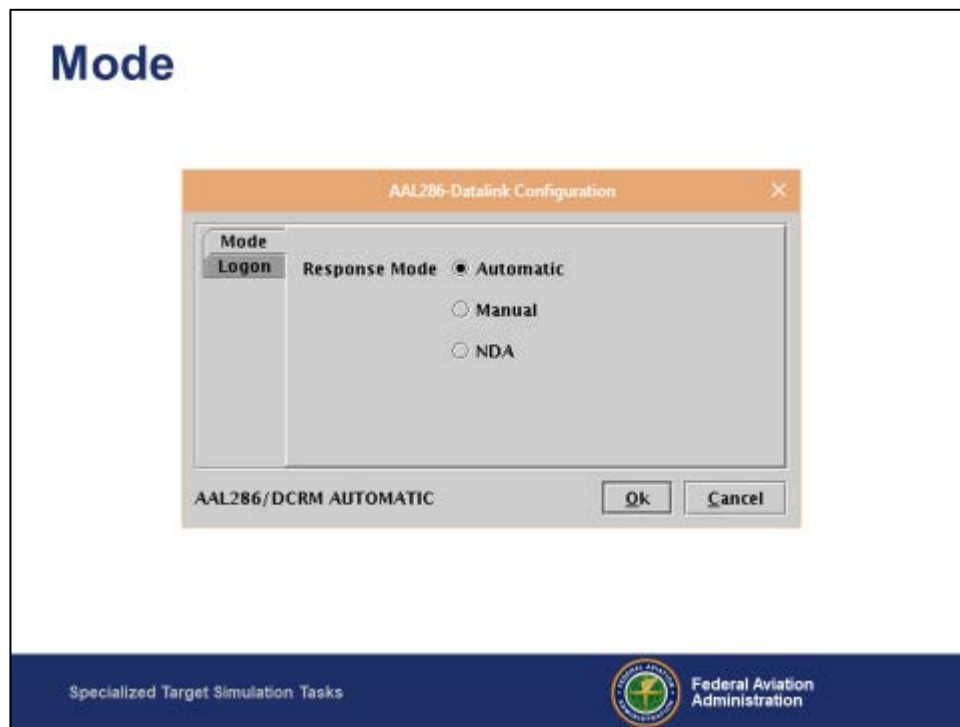
The Logon tab is used to log a CPDLC equipped target onto the CPDLC ground system. If the logon is successful, the session establishment process will start.

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.



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

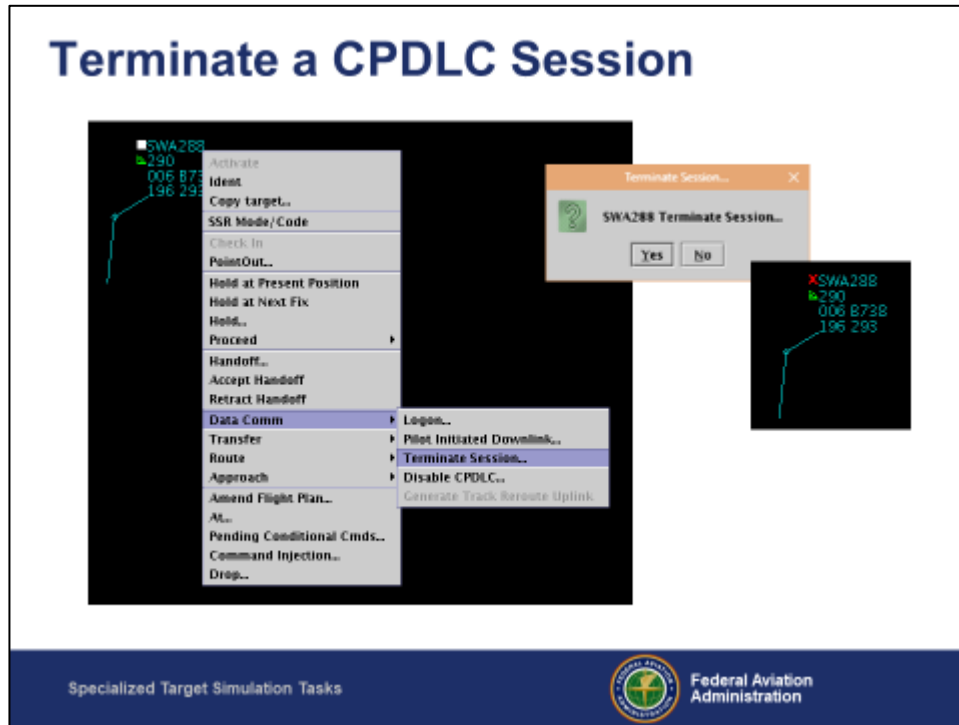
- Automatic
- Manual
- NDA

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.



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

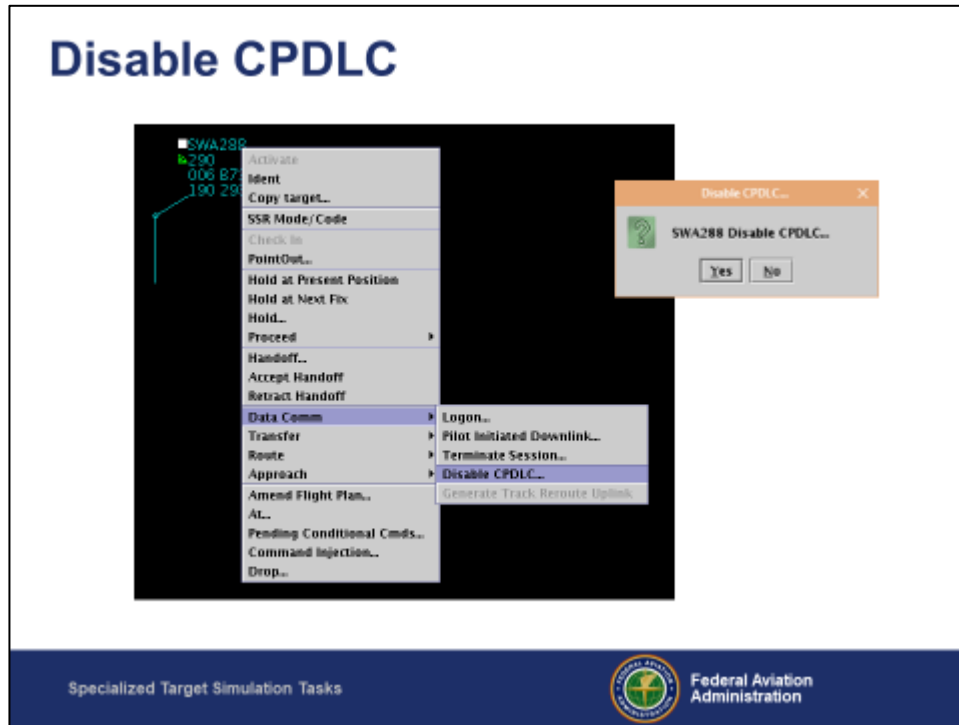
A confirmation window is displayed when the option is selected. Select **Yes** to confirm the command, or **No** to cancel the action.

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.



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.

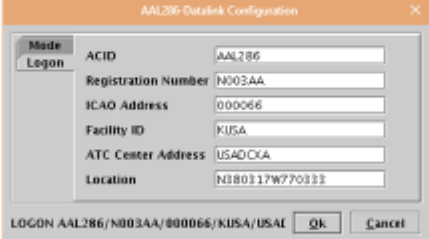
Note that the controller will still see the session indicator on the R and RA-position displays. The Ghost Pilot will see the session indicator as well.

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

Slide - 50.

Knowledge Check

You have selected the Logon option and the system has automatically filled in all the required information. Should you change any of the information?



The screenshot shows a dialog box titled "AAL286-Datalink Configuration" with a close button (X) in the top right corner. On the left, there are two tabs: "Mode" and "Logon", with "Logon" being the active tab. The main area contains several text input fields, each with a label to its left: "ACID" (value: AAL286), "Registration Number" (value: N003AA), "ICAO Address" (value: 000066), "Facility ID" (value: KUSA), "ATC Center Address" (value: USADCKA), and "Location" (value: N380117W770333). At the bottom of the dialog, there is a status bar that reads "LOGON AAL286/N003AA/000066/KUSA/USADCKA" followed by "OK" and "Cancel" buttons.

Field	Value
ACID	AAL286
Registration Number	N003AA
ICAO Address	000066
Facility ID	KUSA
ATC Center Address	USADCKA
Location	N380117W770333

LOGON AAL286/N003AA/000066/KUSA/USADCKA OK Cancel

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Slide - 51.

Knowledge Check

When is a Failed indicator displayed next to the callsign?

- A. After a session is terminated.**
- B. After CPDLC is disabled for a target.**
- C. When a logon fails.**

Specialized Target Simulation Tasks



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Slide - 52.

Topic Introduction

Altitude, Speed and Heading Options

- Altitude Rate Tab
- Altitude Restriction Tab
- Speed Rate Tab
- Speed Restriction Tab
- Turn Rate Tab

Specialized Target Simulation Tasks

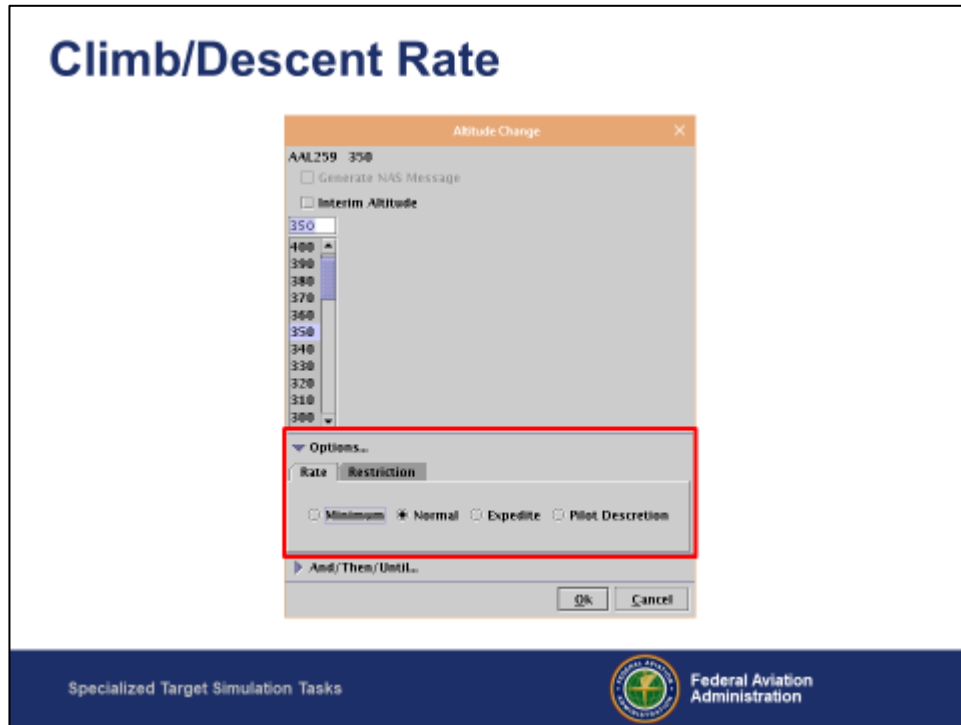
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In Lesson 3 we covered the basic functionality of the Altitude Change, Speed Change, and Heading Change dialogs. These dialogs also provide options to modify the basic target maneuvers.

Possible modifications are:

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

Slide - 53.



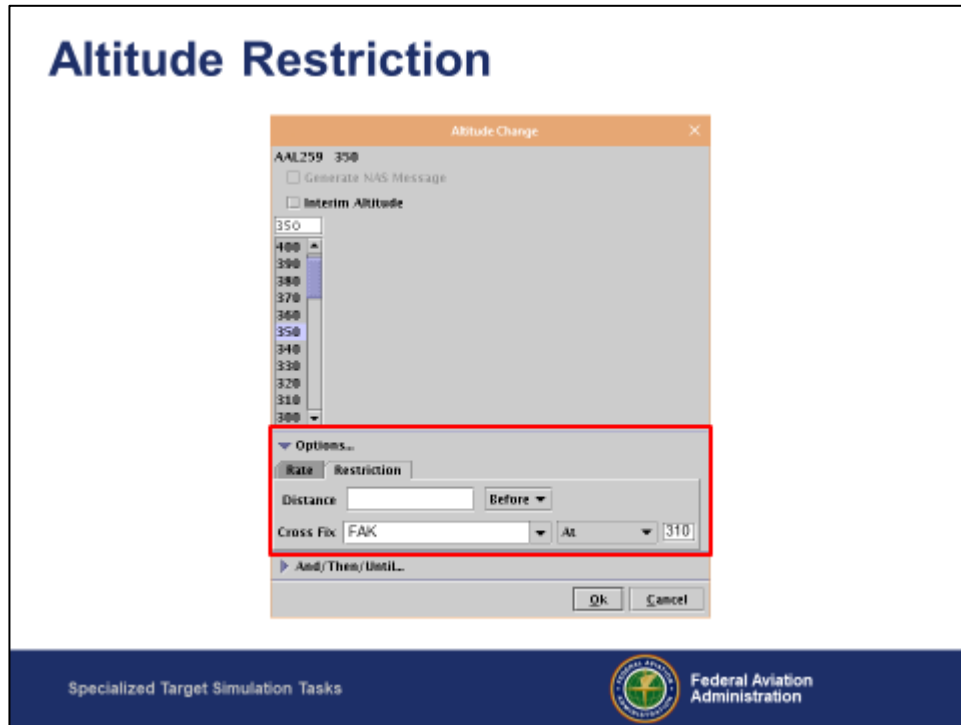
To specify a climb/descent rate:

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.



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**.

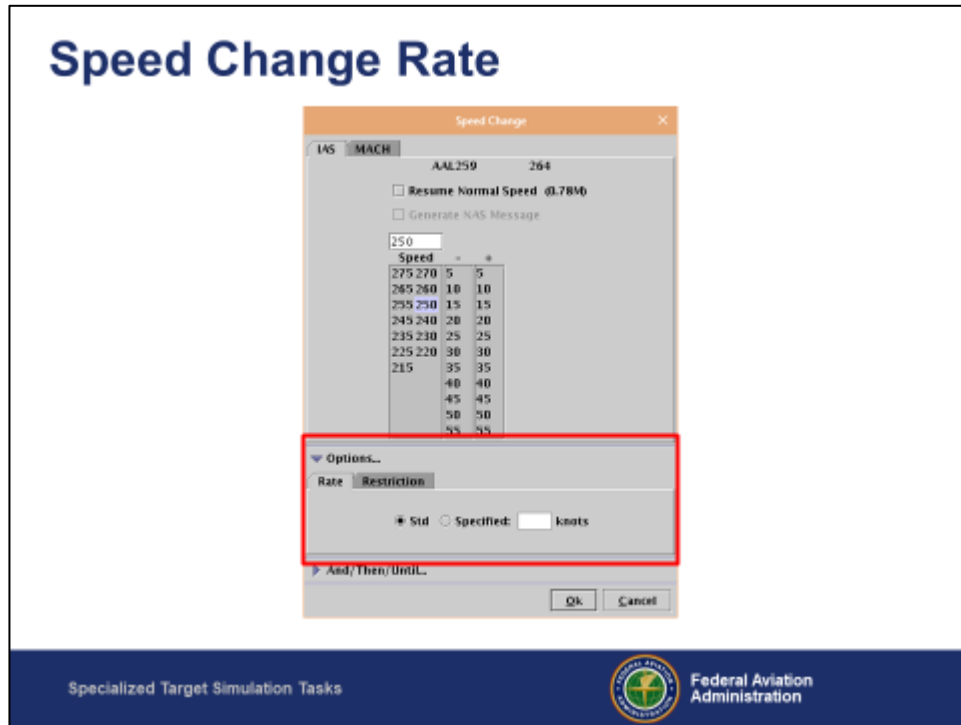
The following conditions will result in an error message:

- 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.

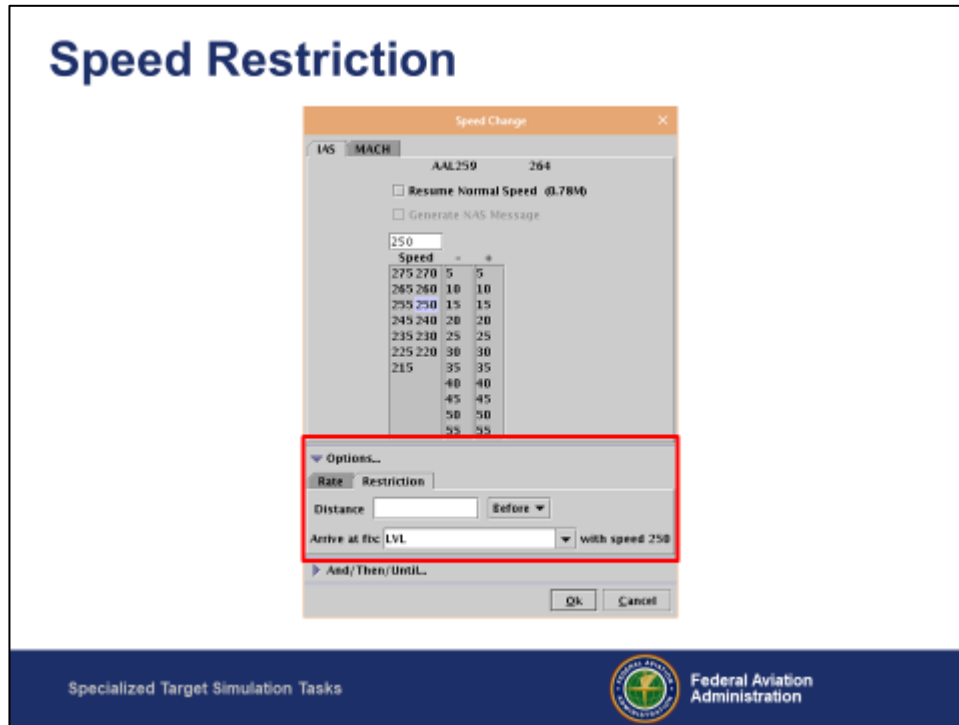


To specify the acceleration/deceleration rate for a speed change:

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.



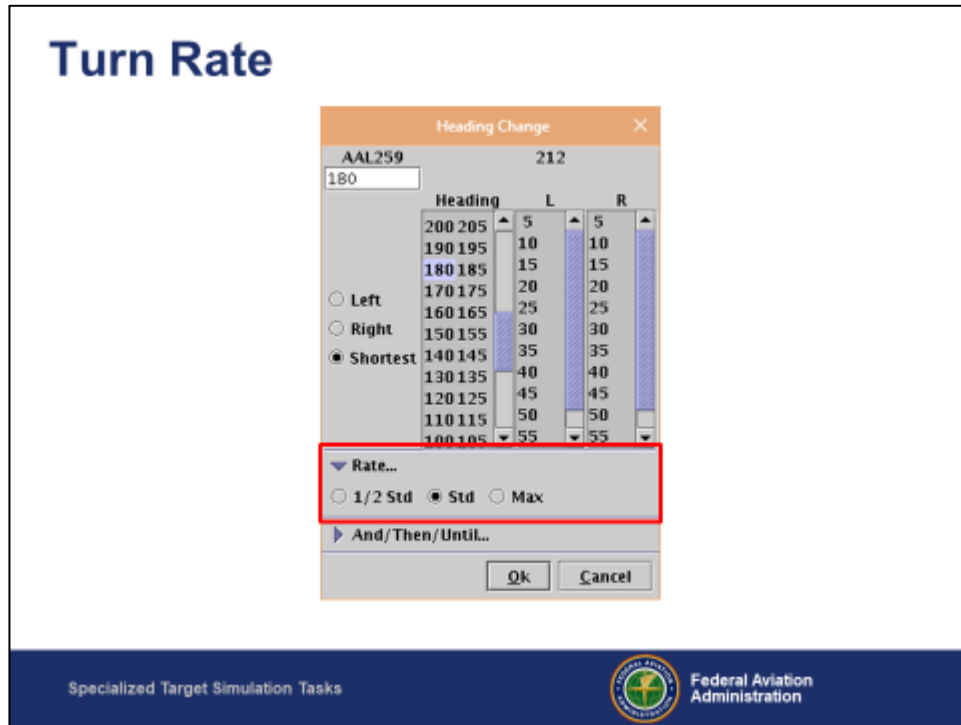
To specify a speed crossing restriction at a fix:

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 by 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.



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).

- 1/2 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.

Command Line Alternatives

Command Line DAL377/A310+	Add a + for expedited climb/descent rate Add a – for reduced climb/descent rate Add a PD for Pilot's Discretion
Command Line DAL377/A310-2000	Specific climb/descent rate
Command Line DAL377/ARASN-120	Altitude crossing restriction
Command Line DAL377/V300-200	Speed change rate
Command Line DAL377/H180+	Add a + for expedited turn rate Add a – for half-standard turn rate

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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.

Knowledge Check

Based on this dialog, what will the target do after crossing FAK at FL310?

The dialog box is titled "Altitude Change" and is for aircraft "AAL250" at altitude "350". It contains the following elements:

- ☐ Generate NAD Message
- ☐ Interim Altitude
- A vertical list of altitudes from 300 to 400 in increments of 10. The value 310 is highlighted.
- An "Options..." button.
- Two tabs: "Rate" (selected) and "Restriction".
- A "Distance" input field.
- A "Before" dropdown menu.
- A "Cross Fix" dropdown menu with "FAK" selected.
- An "At" dropdown menu with "350" selected.
- An "And/Then/Until..." button.
- "OK" and "Cancel" buttons at the bottom right.

Specialized Target Simulation Tasks



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Slide - 60.

Knowledge Check

What is the purpose of the “knots” input box?

The screenshot shows a 'Speed Change' dialog box. At the top, it has 'IAS' and 'MACH' tabs, with 'MACH' selected. Below this, there are two checkboxes: 'Recompute Vertical Speed: 40 FPM' (checked) and 'Generate TWS Message' (unchecked). A 'Speed' input field is set to '210'. Below this is a table with two columns: 'Speed' and 'kts'. The table contains the following data:

Speed	kts
215.218	25
240.240	10
255.254	15
245.240	20
255.258	25
225.226	30
215	35
48	40
45	45
50	50
55	55

Below the table is an 'Options...' section. It has a 'Rate' dropdown set to 'Recompute'. There are radio buttons for 'kts' (selected) and 'Specified', followed by an empty 'Units' input field. At the bottom, there is an 'Add This Item...' button and 'OK' and 'Cancel' buttons.



Slide - 61.

Topic Introduction

- **Combined and Conditional Commands**
- Combined Commands
- Conditional Commands

Specialized Target Simulation Tasks

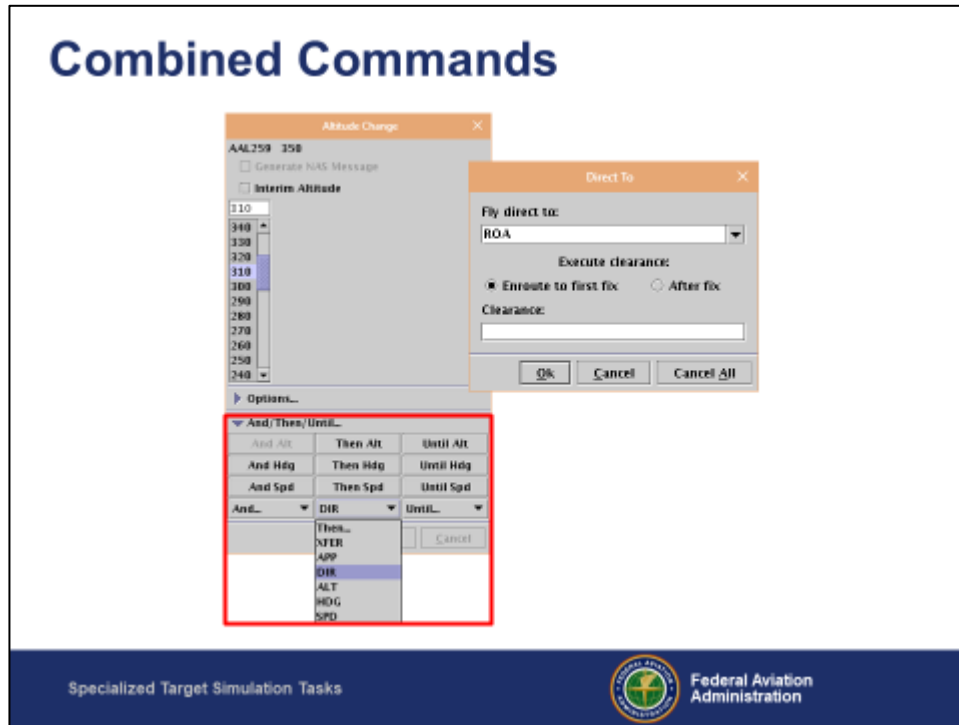


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ATPilot provides options for combining ATCoach commands so they are executed simultaneously, or sequentially. These are called combined commands.

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

Slide - 62.



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.

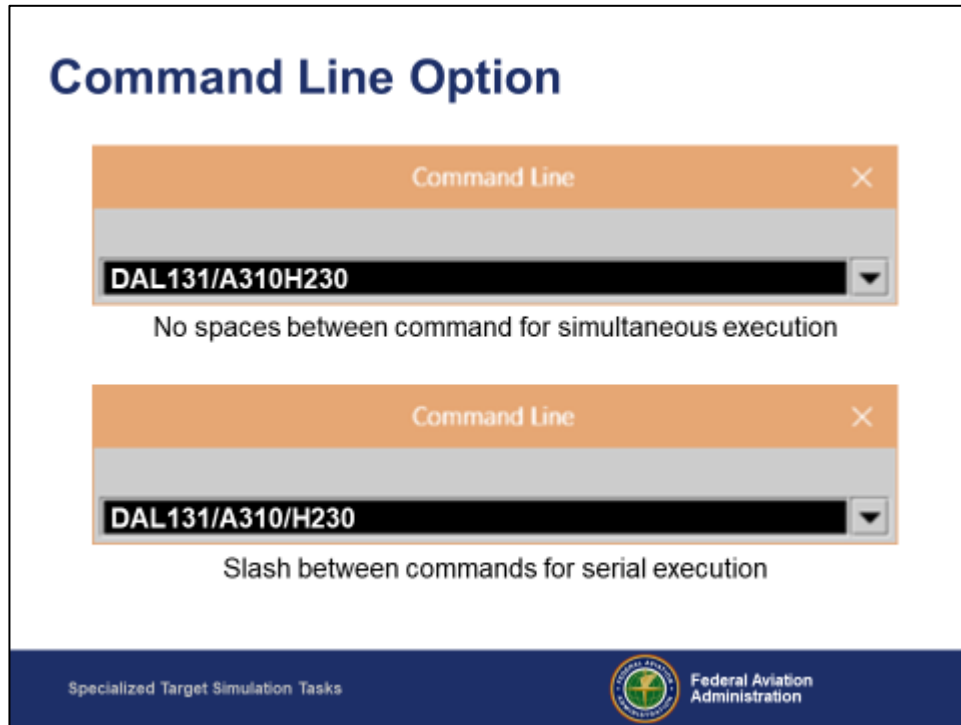
Since most target control changes are to altitude, heading, and speed, there are individual buttons for these dialogs.

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.



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

To do so:

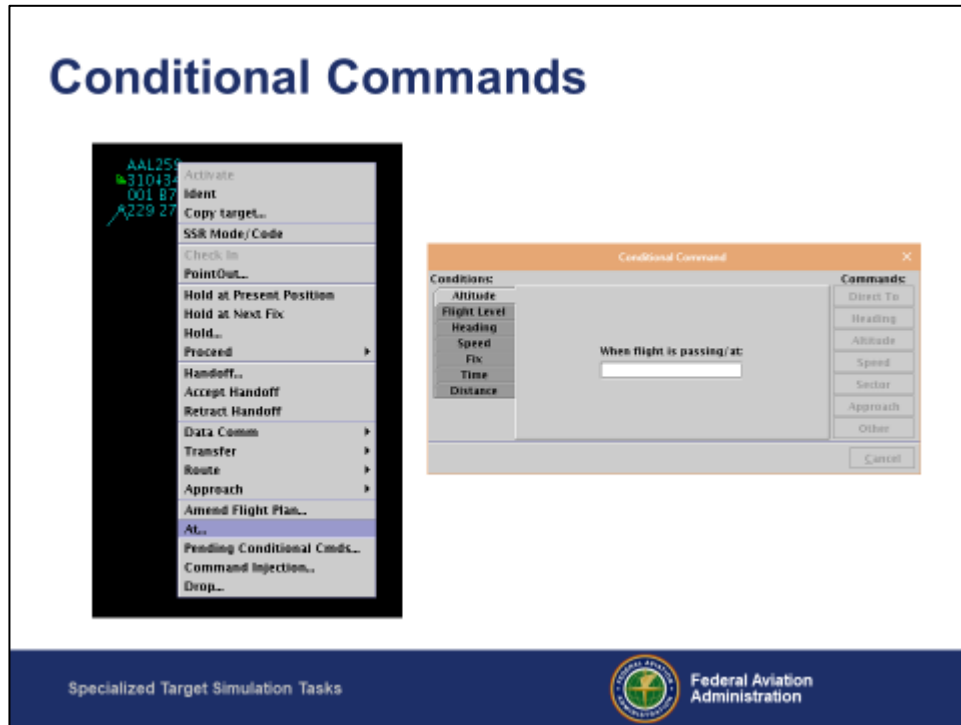
1. Type the desired commands consecutively, with no spaces between them for simultaneous execution.
or
Type the desired commands consecutively, with forward slashes (/) between them for serial execution.
2. Press Enter.

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.

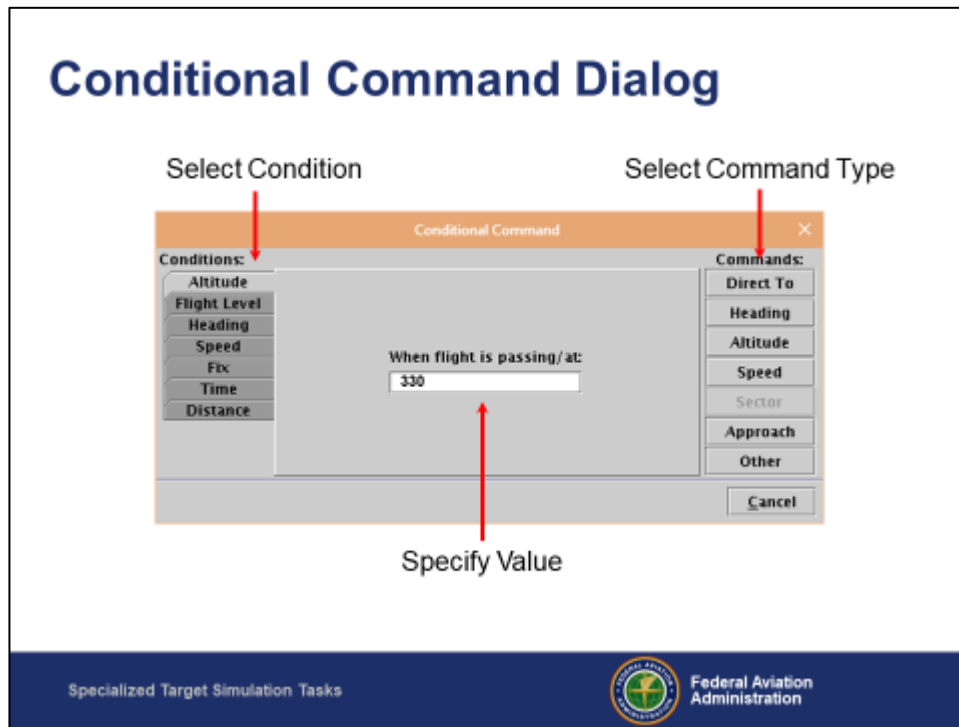
Slide - 64.



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.

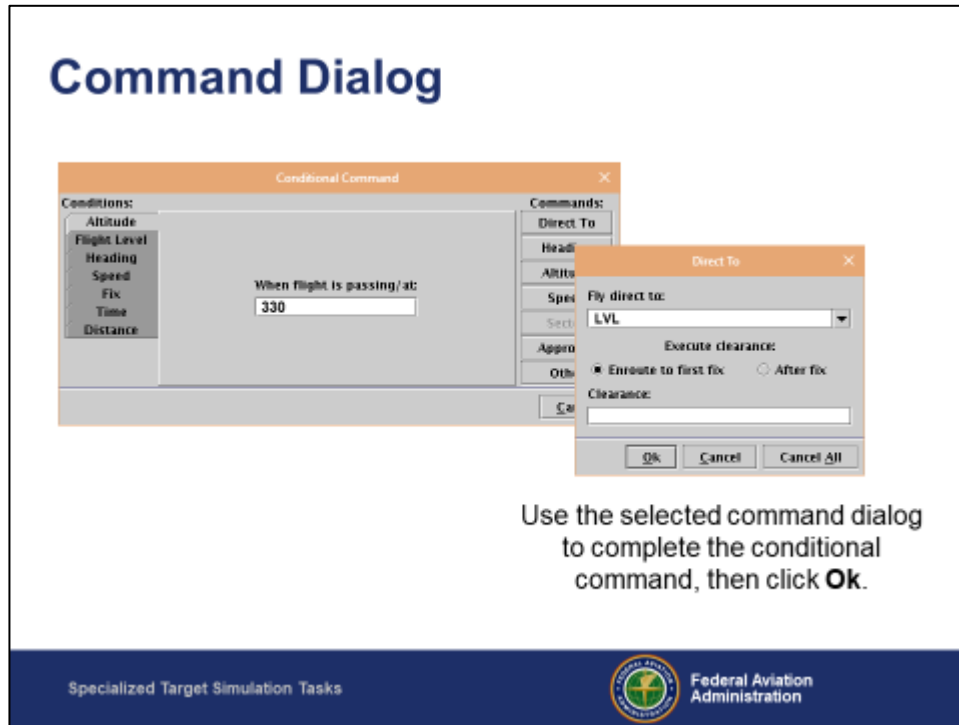
Slide - 65.



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.



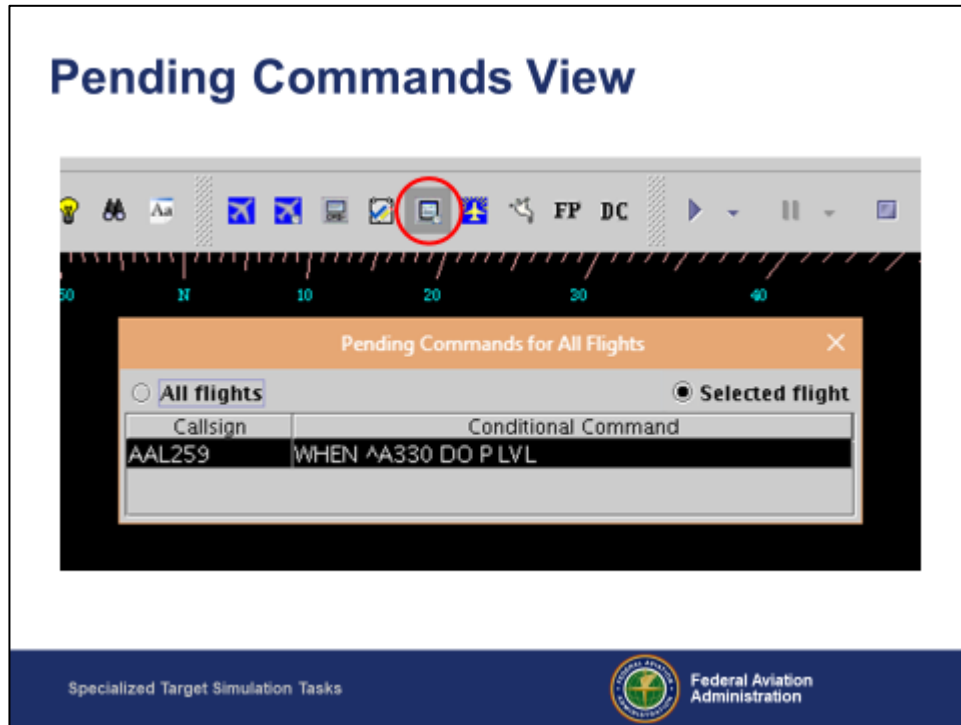
In this example, as soon as the target passes (either climbing or descending) or is level at FL330 the target will proceed direct LVL.

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.

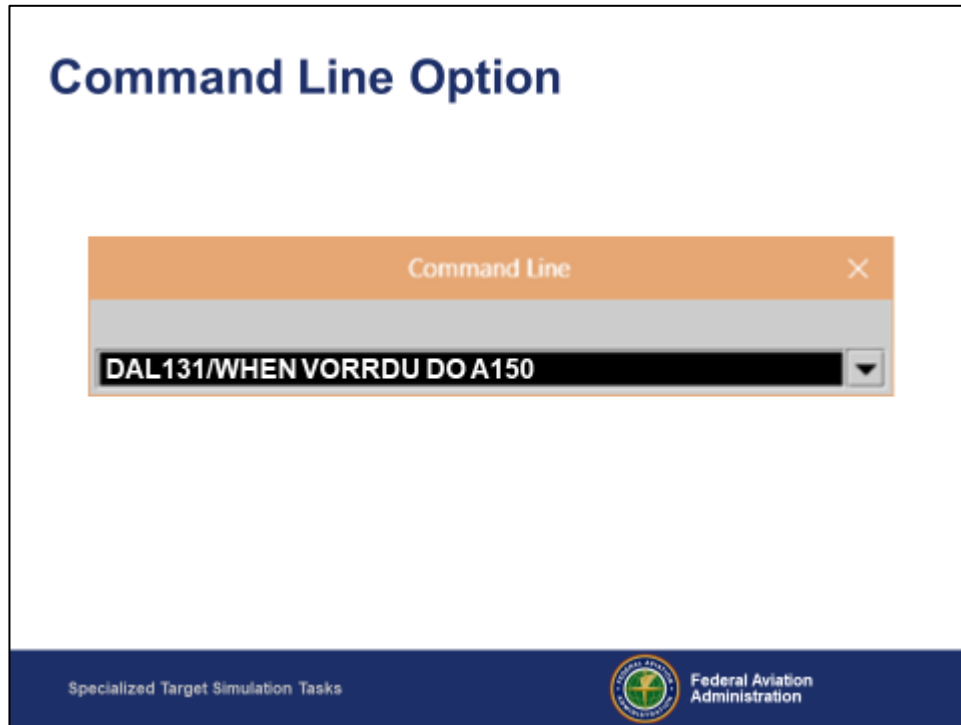


The Pending Commands view displays all conditional commands awaiting execution. The view is accessed by selecting the Pending Commands icon on the Views toolbar. The view has two radio buttons:

- **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.



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.

Knowledge Check

You want a target to descend to 4,000 ft., and after reaching 4,000 ft. then fly heading 250. You've already selected the altitude. Which button should you click next?

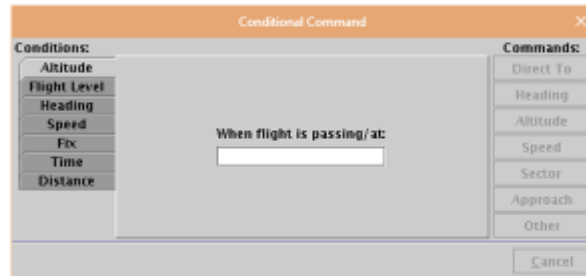
And/Then/Until...		
And Alt	Then Alt	Until Alt
And Hdg	Then Hdg	Until Hdg
And Spd	Then Spd	Until Spd
And...	Then...	Until...
		Ok Cancel



Slide - 70.

Knowledge Check

How do you open the Conditional Command dialog from the Target Control menu?



Slide - 71.

Part Task Scenario 5

- **Part Task scenario to practice specialized target control simulation tasks performed by a Ghost Pilot.**
- **Completed in the Test and Training Lab (TTL) without headsets.**
- **The instructor checklist includes all tasks covered in this lesson.**
- **Approximately 45 minutes.**

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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.

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Summary

- **Using the Command Line view**
- **Approaches**
- **CPDLC Tasks**
- **Altitude, Speed and Heading Options**
- **Combined and Conditional Commands**



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