Federal Aviation Administration

# *55054003 EN ROUTE RADAR ASSOCIATE CONTROLLER TRAINING PART C: ADVANCED CONCEPTS*

## Lesson 8: Pilot Initiated Downlinks (PIDs)

**Version: 1.0 2022.08**

***INSTRUCTOR LESSON PLAN***

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# LESSON PLAN DATA SHEET

| | |
|---|---|
| Course Name | En Route Radar Associate Controller Training Part C: Advanced Concepts |
| Course Number | 55054003 |
| Lesson Title | Pilot Initiated Downlinks (PIDs) |
| Duration | 1 hour, 45 minutes (includes lesson, part-task exercise, and ELT) |
| Version | 1.0 2022.08 |
| Reference(s) | JO 7110.65, Air Traffic Control; JO 7110.125, Controller Pilot Data Link Communications (CPDLC) in the ERAM Environment; TI 6110.101, En Route Automation Modernization RA-Position User Manual; TI 6110.108, ERAM Quick Reference Controller Card; ERAM ATCHI MISC 230.05 |
| Prerequisites | NONE |
| Handout(s) | ⊙ Part-Task Exercise *HO01_08 (Print prior to class)*<br>⊙ TI 6110.108, ERAM Quick Reference Controller Card |
| Exercise / Activity | Refer to handout for:<br>⊙ Part-Task Exercise: Pilot Initiated Downlinks |
| Scenario | ⊙ Run scenario 55054003_L08_S## in TTL |
| Assessments | ⊙ YES - Written *(Refer to ELT01_L08, print prior to class)* |
| Materials and Equipment | ⊙ Pencil and/or pen |
| Other Pertinent Information | ⊙ **Ensure lesson materials are downloaded to the classroom computer**<br>⊙ This lesson is based on ERAM EAE410<br>⊙ The lesson has been reviewed and reflects current orders and manuals as of April 2022 |

*As you prep for this lesson, recall and be prepared to talk about examples and personal experiences that illustrate or explain the teaching points in the lesson.*

# LESSON ICON LEGEND

| | Description |
|---|---|
|  | The Activity icon indicates an exercise, lab, or hands-on activity. |
|  | The Discussion Question icon signals a discussion question to be asked to the students. |
|  | The Handout icon indicates a handout is to be distributed to the students. |
|  | The Instructor Note icon is in hidden text and indicates text that is for the instructor only. |
|  | The Multimedia icon indicates a video or audio clip is in the presentation. |
|  | The Phraseology icon indicates that phraseology is in the content. |
|  | The WBT icon indicates a component of web-based training. |
|  | The Click icon indicates a PPT slide with click-based functionality to present additional information. |
|  | The Definition icon indicates a published definition. |

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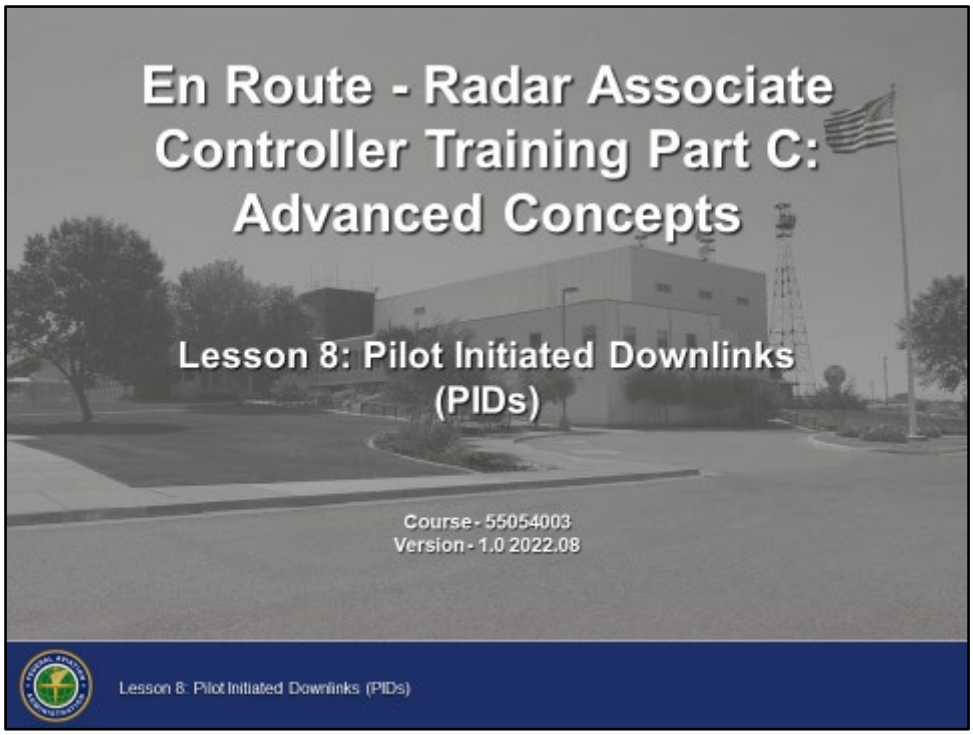
# LESSON INTRODUCTION

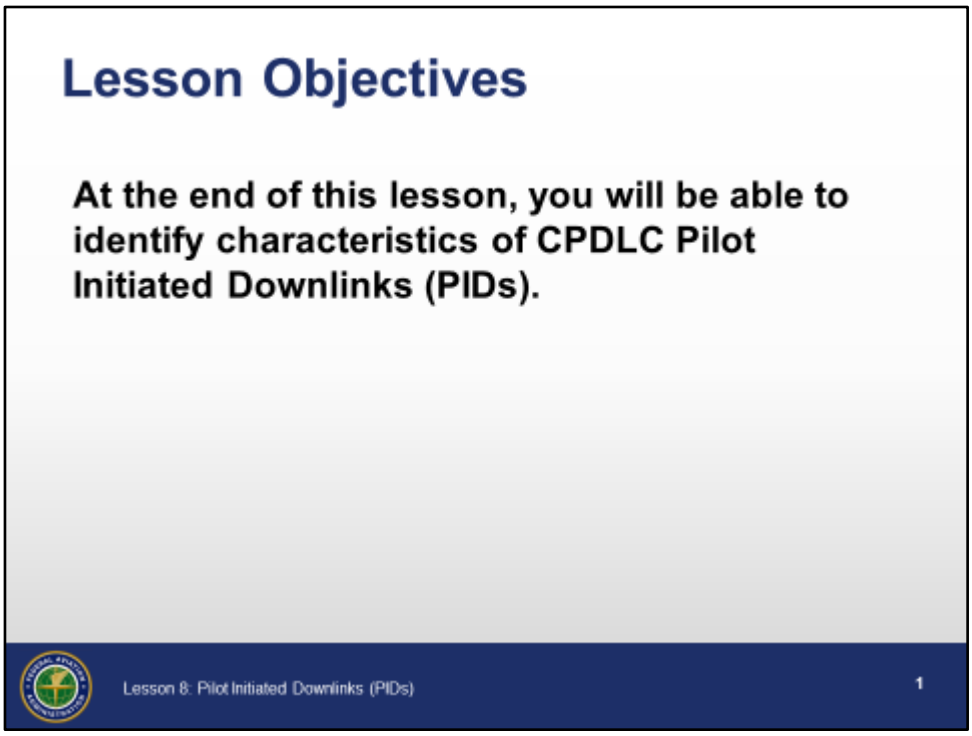
**Overview**




This lesson introduces Pilot Initiated Downlinks (PIDs), which provide an alternative to voice requests and subsequent clearances.

# LESSON INTRODUCTION *(CONT'D)*

**Lesson Objectives**




*Review the lesson objectives.*

At the end of this lesson, you will be able to identify characteristics of CPDLC Pilot Initiated Downlinks (PIDs).

**NOTE:** There will be a graded end-of-lesson test upon completion of the lesson. The passing score is 70%. If you do not achieve a score of 70%, you will be provided study time and one retake of an alternate end-of-lesson test.

# CPDLC PILOT INITIATED DOWNLINK

**Pilot Initiated Downlinks (PIDs)**

TI 6110.101, sec. 11.2

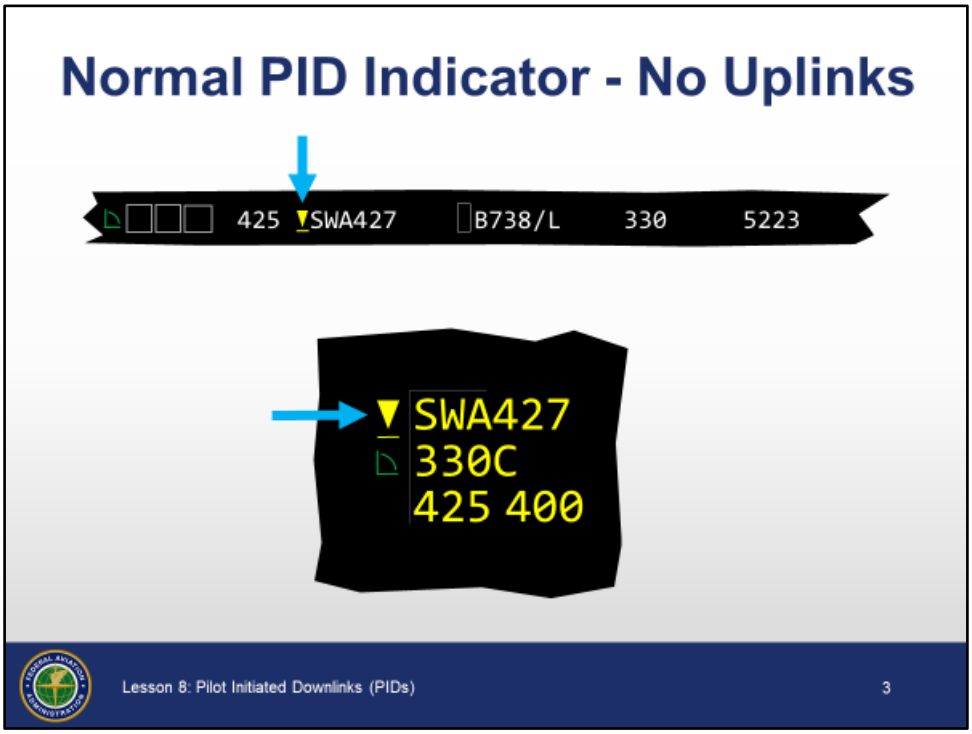

- CPDLC includes the capability for Pilot Initiated Downlinks (PIDs)
- The two types of PIDs are Normal and Emergency
  - Normal PID
    - Altitude, message received:
      - REQUEST <altitude>
      - REQUEST CLIMB TO <altitude>
      - REQUEST DESCENT TO <altitude>
    - Route, message received:
      - REQUEST DIRECT TO <POSITION>
    - Voice contact, message received:
      - REQUEST VOICE CONTACT
  - Emergency PID
    - Will be covered in a later lesson

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Normal PID Indicator - No Uplinks**

TI 6110.101, sec. 11.2

TI 6110.100, sec. 11.2.2

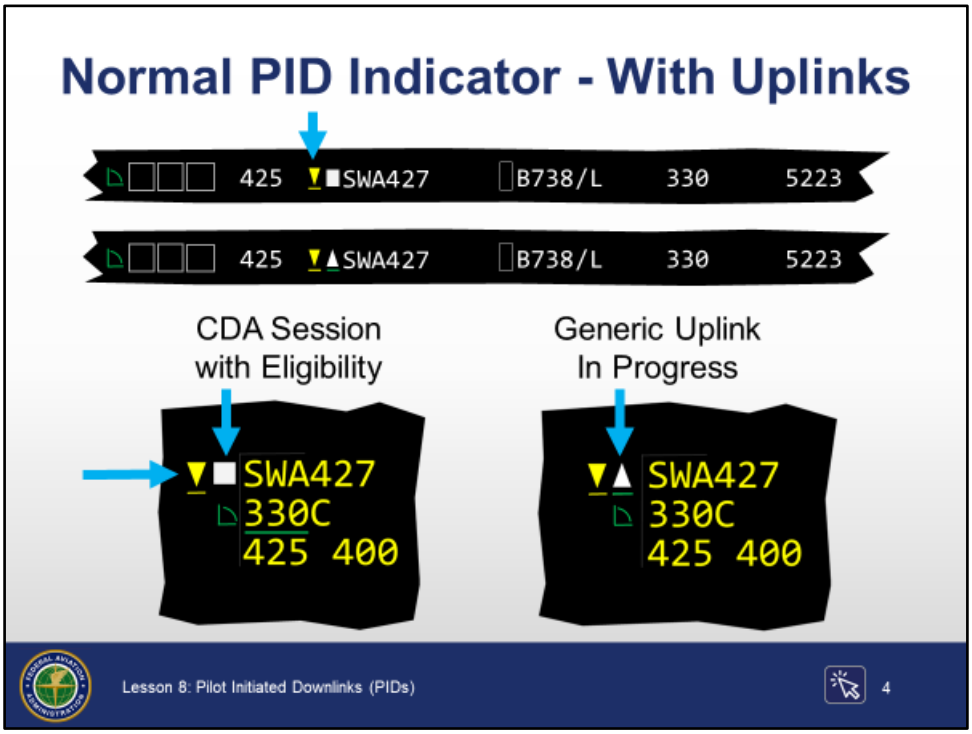



- Normal PID indicator with no uplinks:
  - Indicates at least one open PID waiting for a response
  - Is a yellow downward pointing triangle with a yellow line underneath
  - Replaces the CDA Session with Eligibility symbol
  - Is displayed in both the ACL and the FDB

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Normal PID Indicator - With Uplinks**

TI 6110.101, sec. 11.2




*Slide is animated, 2 clicks. Click where indicated by click icon.*

⊙ Normal PID indicator with uplinks

- If the Message Out menu (Mini Mo) contains any entries (i.e., uplinks), the PID indicator will be offset to the left of either the CDA session with eligibility symbol or the Generic Uplink indicator
  - PID indicator to the left of the CDA session with eligibility symbol indicates an altitude uplink, route uplink, or both
  - PID indicator to the left of the Generic Uplink indicator indicates an uplink that is not one of the following:
    - Altitude
    - Route
    - TOC
    - Confirm Assigned Altitude (CAA)

**Examples:** Uplink Frequency and Uplink Altimeter

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# PILOT INITIATED DOWNLINK *(CONT'D)*

**Normal PID Indicator - With Uplinks (Cont'd)**

TI 6110.101, sec. 11.2

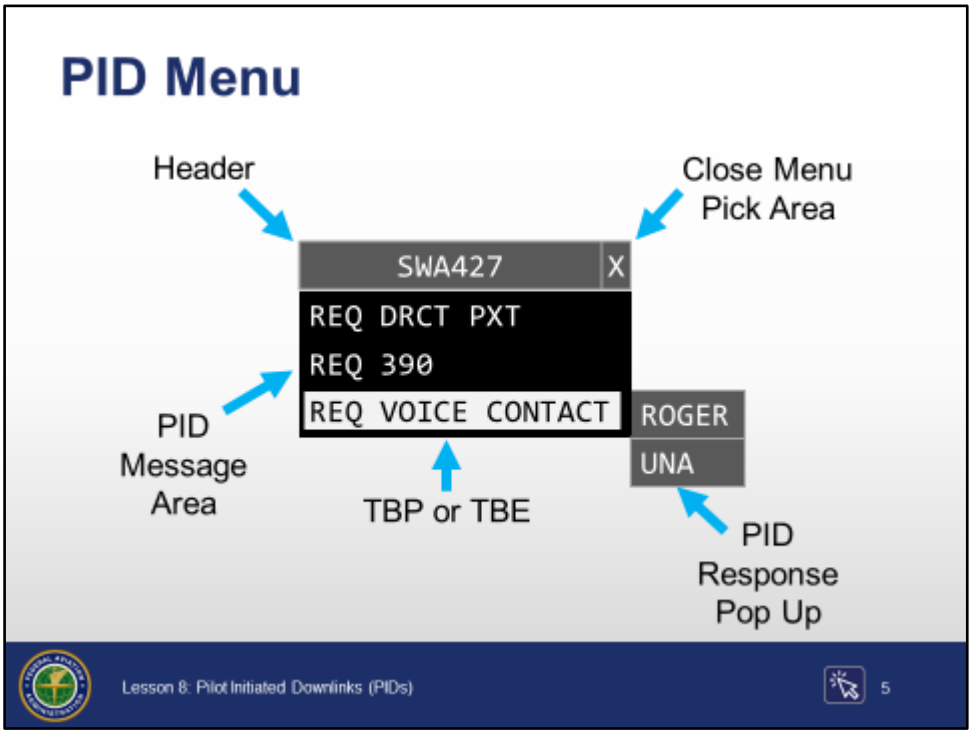
- The PID indicator appears on both the ACL and FDB

*Mention that the Message Out menu (Mini Mo) is accessed by TBP or TBE on the CDA session with eligibility symbol or on the Generic Uplink In Progress indicator, if there are any open or recently closed uplinks or downlinks for the aircraft. This menu is covered in a later lesson.*

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Menu**

TI 6110.101,
sec. 11.1.1




*Slide is animated, 1 click. Click where indicated by click icon.*

- TBP or TBE on the PID Indicator to open the PID menu for that aircraft
  - Appears next to the selected PID on the ACL or Situation Display
- The PID menu consists of the following:
  - Header
  - Close menu pick area
  - PID message area
- The PID message area can include one or more PID requests from the aircraft
  - If there is more than one, TBP or TBE each individual request to respond to it
  - When a PID is selected, it will be highlighted and the available response options displayed in the PID Response pop up
    - Available response options vary based on the PID request type, error conditions, and whether a STANDBY response has been uplinked

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# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Menu (Cont'd)**

TI 6110.101, sec. 11.2

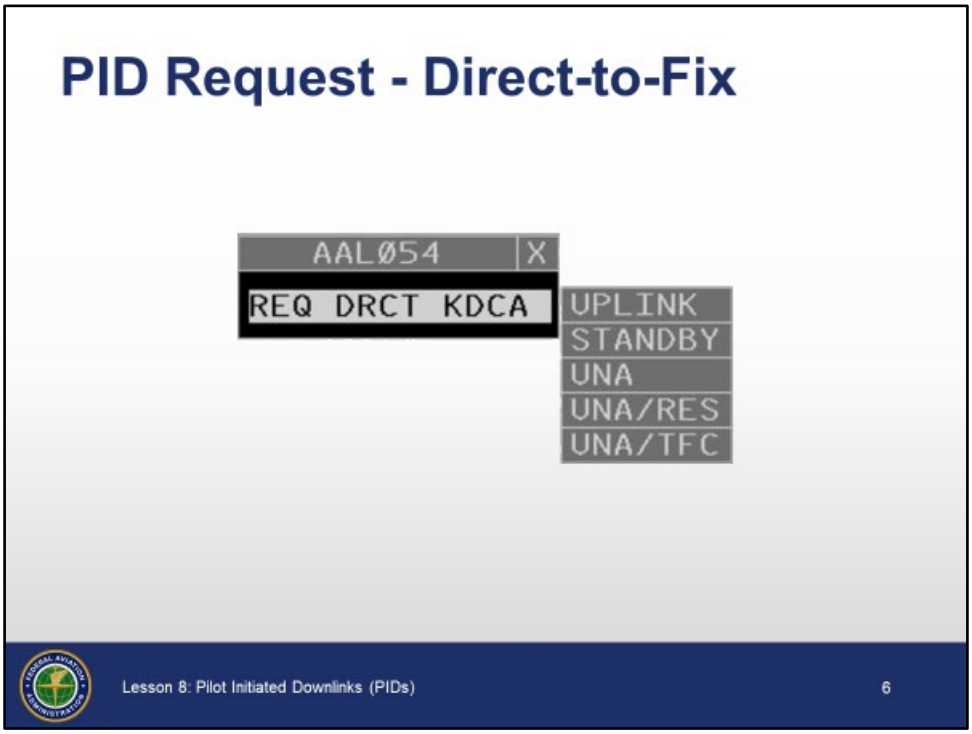
⊙ The PID menu will close as a result of any of the following:

- Select the PID menu close pick area
- TBP anywhere outside the menu
- Press the CLEAR key on the keyboard
- Select a response when there is only one PID request

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - Direct-to-Fix**

TI 6110.101, sec. 11.2.1.2

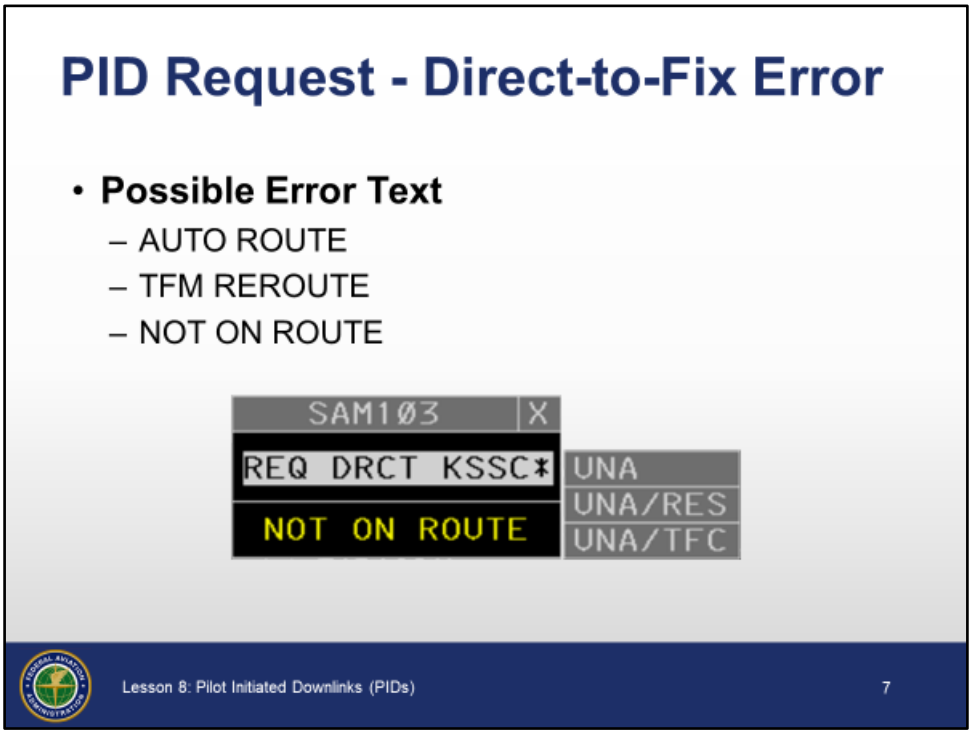



- When the PID menu is opened and there is only one PID request, that request will be automatically selected and all available response options will be presented
- For a Direct-to-Fix request, the possible response options are:
  - UPLINK
    - Results in a PROCEED DIRECT TO route uplink
  - STANDBY
    - Results in a STANDBY uplink
    - The Normal PID indicator will remain displayed on the FDB and ACL
  - UNA
    - Results in an UNABLE uplink
  - UNA/RES
    - Results in an UNABLE DUE TO AIRSPACE RESTRICTION uplink
  - UNA/TFC
    - Results in an UNABLE DUE TO TRAFFIC uplink
- TBP or TBE on the desired option to enter

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - Direct-to-Fix Error**

TI 6110.101, sec. 11.4

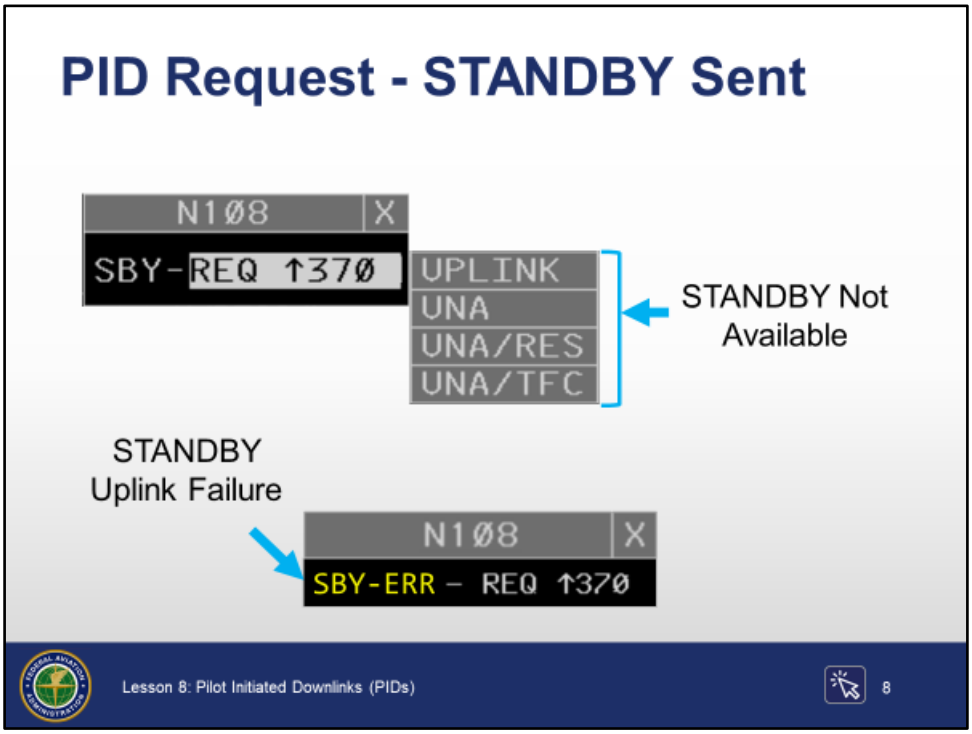



- For Direct-to-Fix requests, the system will determine if there are any errors associated with the requested fix
- Possible error text will be displayed in yellow:
  - AUTO ROUTE
    - Fix is part of or beyond an unacknowledged auto route
  - TFM REROUTE
    - Fix is part of or beyond an unapplied Airborne Reroute (ABRR)
  - NOT ON ROUTE
    - Fix is not on the current cleared route
- If there is an error, the only available response options will be:
  - UNA
    - Results in an UNABLE uplink
  - UNA/RES
    - Results in an UNABLE DUE TO AIRSPACE RESTRICTION uplink
  - UNA/TFC
    - Results in an UNABLE DUE TO TRAFFIC uplink

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - STANDBY Sent**

TI 6110.101, sec. 11.2.1.5



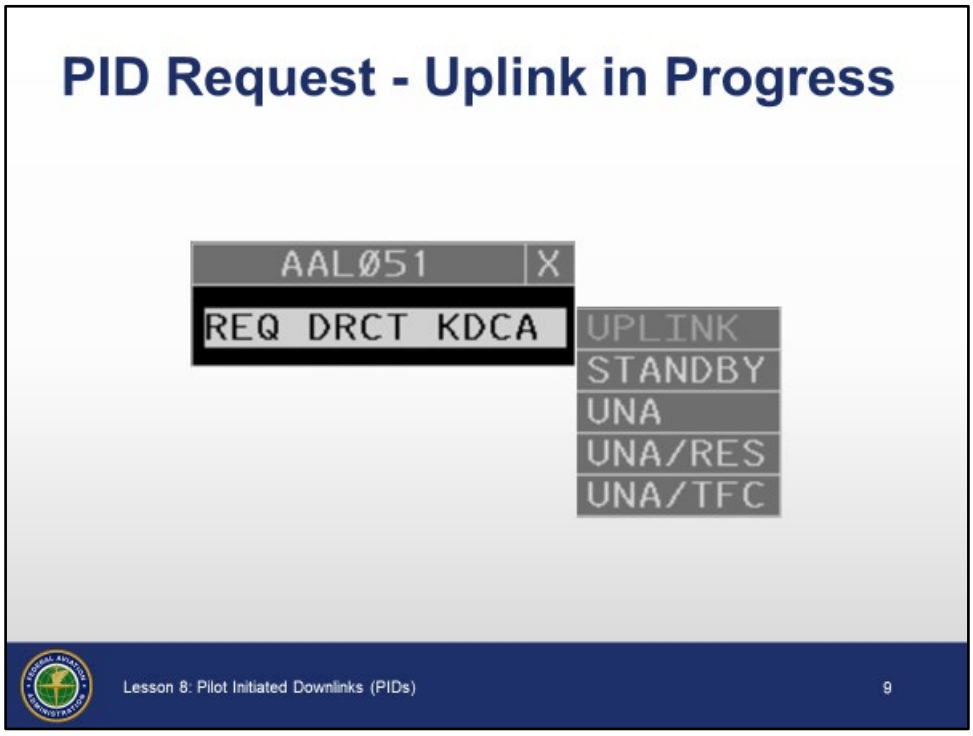

*Slide is animated, 1 click. Click where indicated by click icon.*

- If a STANDBY response has been sent to the aircraft, the next time the PID menu is opened the PID request will be preceded by SBY
  - STANDBY response option will not be available
- If for some reason the STANDBY uplink fails to reach the aircraft, the text SBY - ERR will be displayed in yellow text
- The same behavior applies to both route and altitude requests

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - Uplink in Progress**

TI 6110.101, Table 10-4

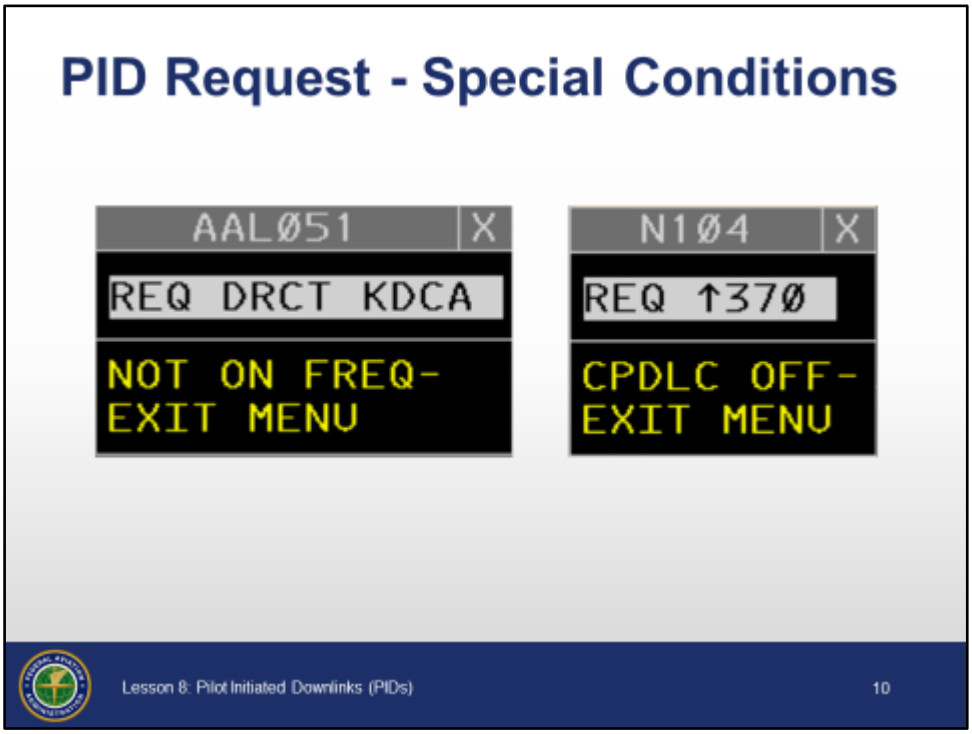



- If the PID menu is opened and an uplink of the same type as the PID request is in progress, the UPLINK response option will be grayed out
  - Selecting the grayed out UPLINK option will result in a cursor error response
- The same behavior applies to both route and altitude requests

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - Special Conditions**

TI 6110.101, sec. 11.4




- When the PID menu is opened and there is a route or altitude request, the system will check for various conditions that prevent an uplink from being sent to the aircraft
- The conditions are:
  - Aircraft has not been marked on frequency
  - Unacknowledged Confirm Assigned Altitude (CAA) mismatch
  - Unacknowledged abnormal uplink
  - Unacknowledged emergency PID
  - Transfer of Communication (TOC) in Progress
  - Session terminated
  - CPDLC is off

**NOTE:** An unacknowledged CAA mismatch and an unacknowledged abnormal uplink will be covered in a future lesson.

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# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - Special Conditions (Cont'd)**

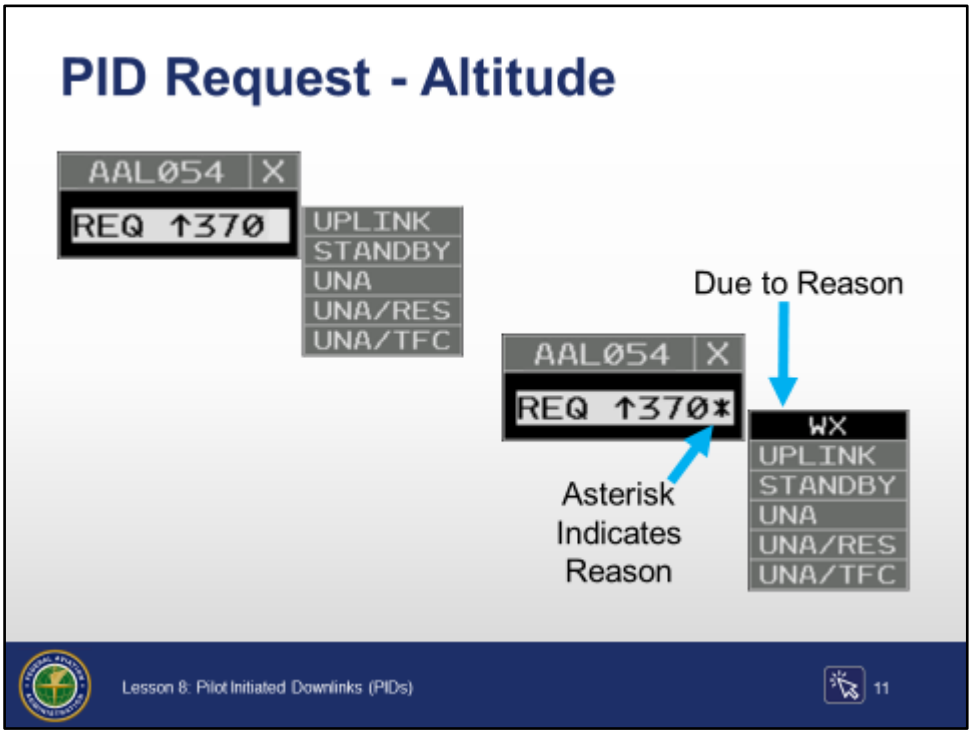
TI 6110.101, secs. 11.4 and 11.2.4.1

- If any of the conditions exist, the system will display error text at the bottom of the PID menu and no response options will be provided
  - The only action that can be taken is to exit the menu
  - If the condition is resolved, reopen the menu and the normal response options will be available
- Another special condition is when the PID message includes Free Text elements that are not recognized by CPDLC
  - When a pilot downlinks a PID containing only free text:
    - CPDLC will automatically send an unable response to the pilot
    - The response to the pilot will also include the following message:
      - MESSAGE NOT DELIVERED. FREE TEXT/DUE TO REASON NOT SUPPORTED. CONTACT ATC OR RESEND REQUEST.
    - PID message is discarded
    - Message History view will not display discarded PID

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - Altitude**

TI 6110.101, sec. 11.2.1




*Slide is animated, 1 click. Click where indicated by click icon.*

- For an altitude request, the possible response options are:
  - UPLINK
  - STANDBY
  - UNA
  - UNA/RES
  - UNA/TFC
- TBP or TBE on the desired option to select it
- An asterisk next to the request indicates that a pilot included a reason for the request
- The Due to Reason text will be displayed at the top of the PID response pop up
  - There are two possible reasons supported:
    - Due to Weather (WX)
    - Due to Aircraft Performance (ACFT PER)

# PILOT INITIATED DOWNLINK *(CONT'D)*

**PID Request - Voice Contact**

TI 6110.101, sec. 11.2.1.3

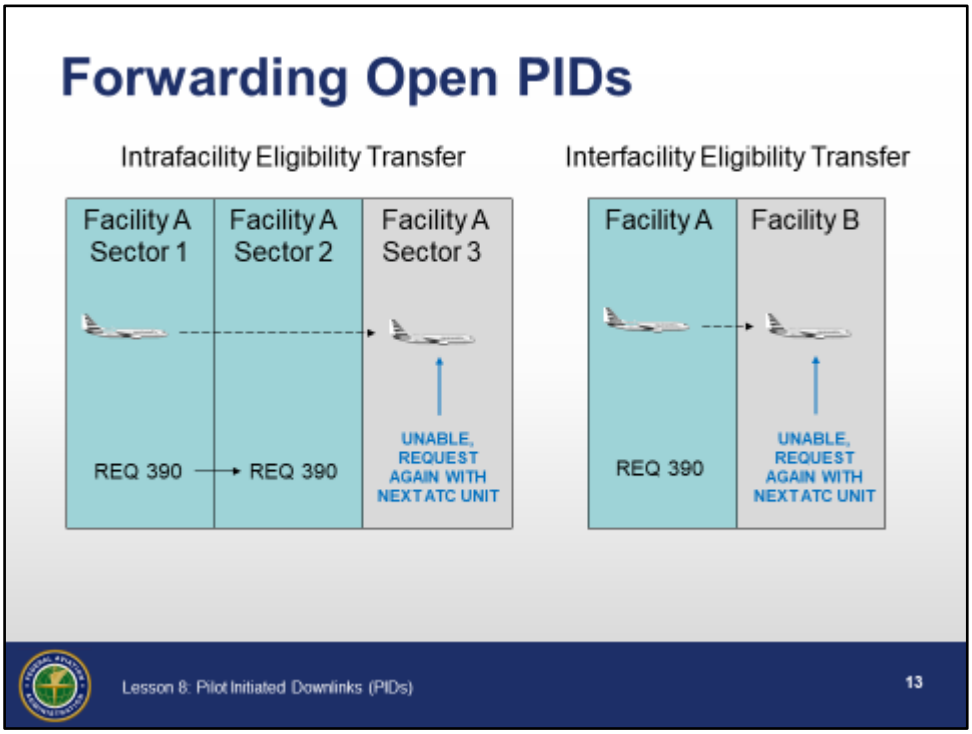

- For a Voice Contact request, the possible response options are:
  - ROGER
  - UNA
- TBP or TBE on the desired option to select it
- Voice Contact requests are not checked for the conditions that prevent an uplink
- Once the ROGER response is uplinked, the controller should uplink the appropriate frequency for voice communication
- The Uplink Frequency (UF) message can be used to uplink a frequency to the aircraft

**NOTE:** The UF message is covered in a later lesson.

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Forwarding Open PIDs**

TI 6110.101, sec. 11.2.2.1




- A PID request will only be forwarded intrafacility and on the first transfer of eligibility
  - On the second transfer of eligibility or interfacility transfer of eligibility:
    - The system will automatically uplink:
      - UNABLE, REQUEST AGAIN WITH NEXT ATC UNIT message, *and*
      - The PID request will be closed by the system and removed from the PID menu

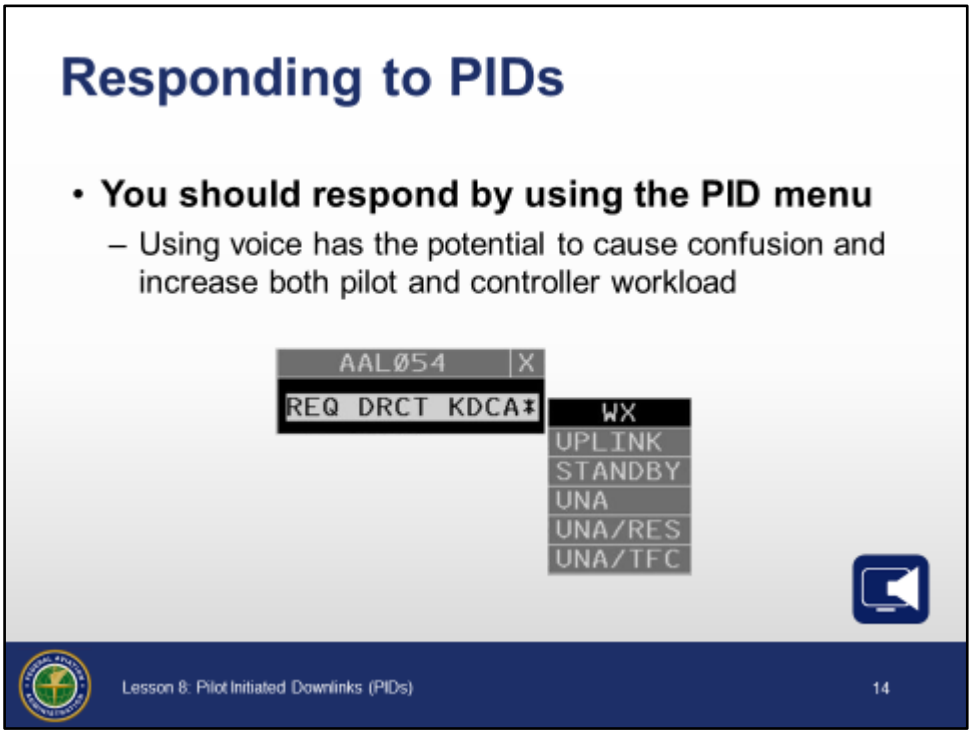
**NOTE:** The reason the PID request is only forwarded once is that the request may have become stale (e.g., the aircraft may have passed the requested fix).

**NOTE:** Track control and eligibility are independent of each other.

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Responding to PIDs**

TI 6110.101, sec. 11.2




*Inform the students that the video they are about to see uses the term Data Comm instead of CPDLC when speaking of the system.*

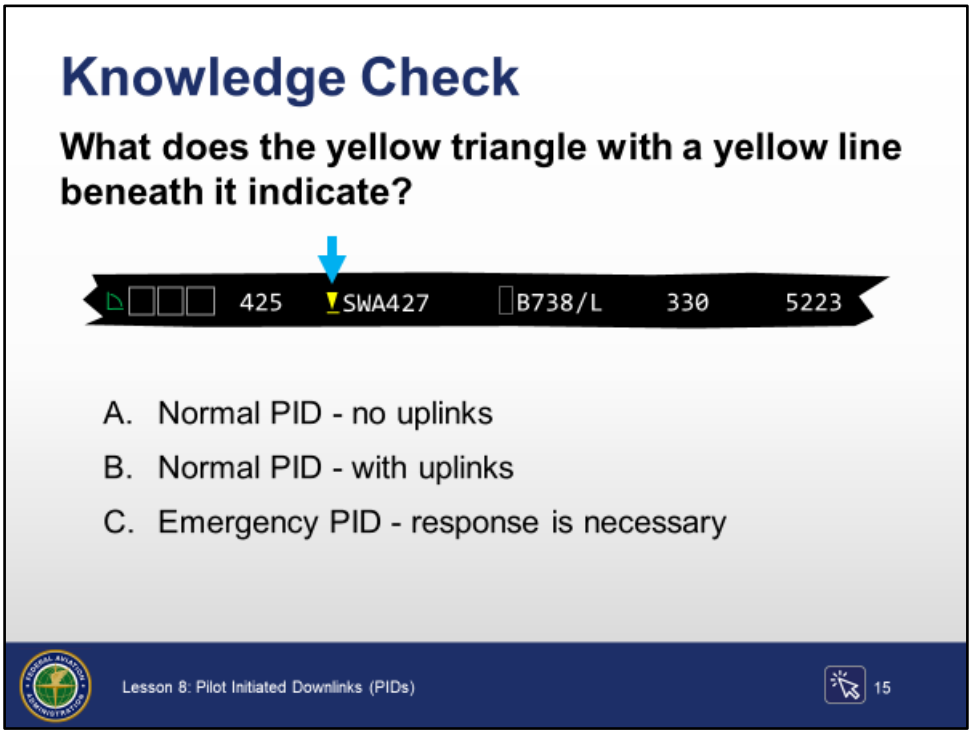
*Click to begin the video (4 minutes). Instructors should discuss the content of the video immediately after playing. Discuss how this applies locally.*

⊙ PID requests should only be responded to by using the PID menu

- Using voice or other CPDLC methods has the potential to cause confusion and increase both pilot and controller workload

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Knowledge Check**

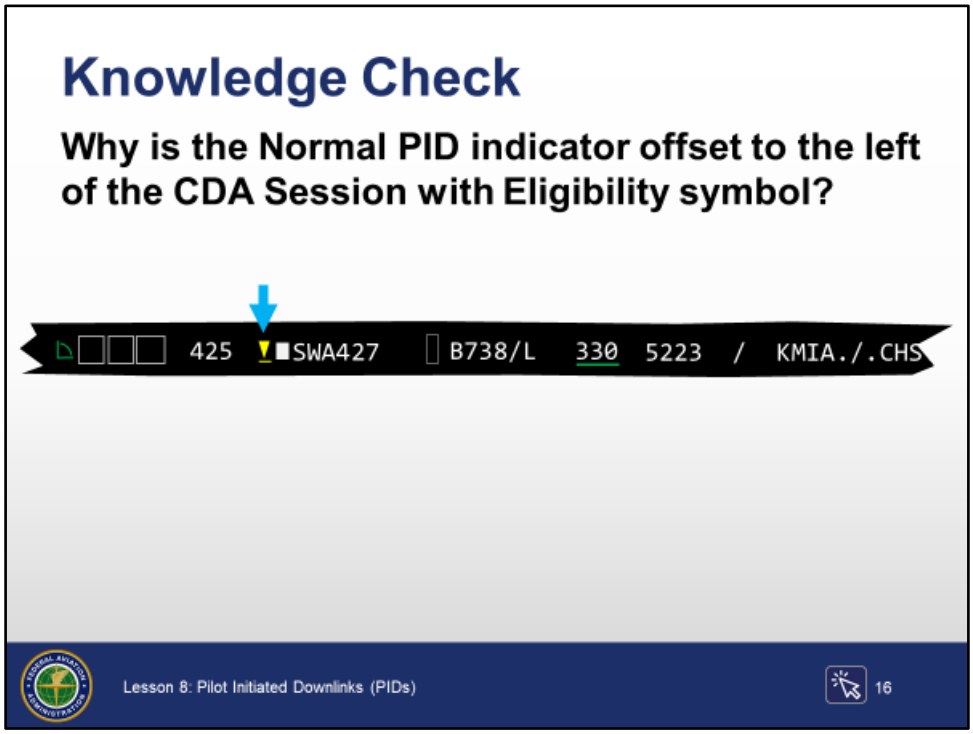



**Question:** What does the yellow triangle with a yellow line beneath it indicate?

***Answer:*** *A. Normal PID - no uplinks*

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Knowledge Check**



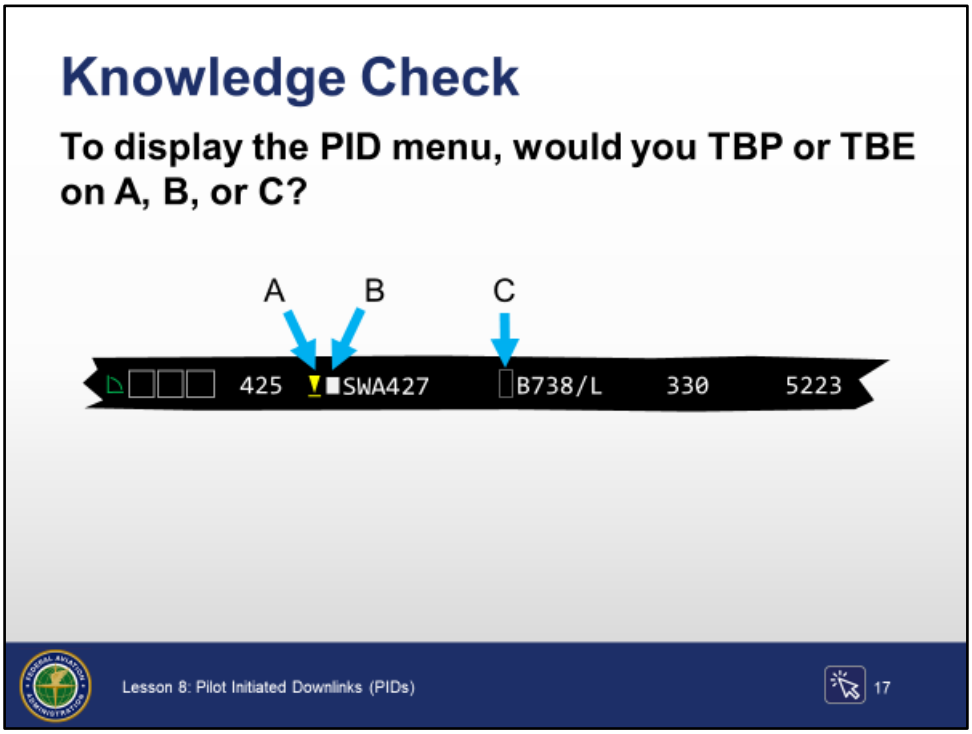

**Question:** Why is the Normal PID indicator offset to the left of the CDA Session with Eligibility symbol?

***Answer:*** *There is an altitude uplink in progress which results in the Message Out menu (Mini Mo) containing at least one entry.*

*Inform the students that a Route Uplink In Progress indicator would also cause a Normal PID indicator offset to the left of the CDA Session with Eligibility symbol.*

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Knowledge Check**

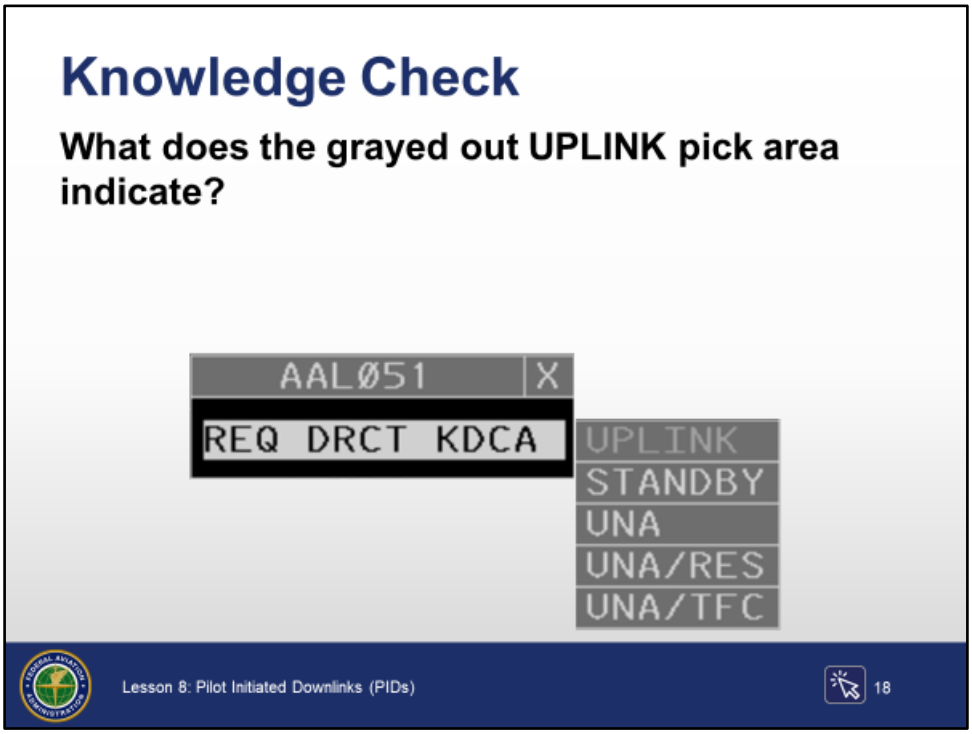



**Question:** To display the PID menu, would you TBP or TBE on A, B, or C?

***Answer:*** *A (Normal PID indicator)*

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Knowledge Check**

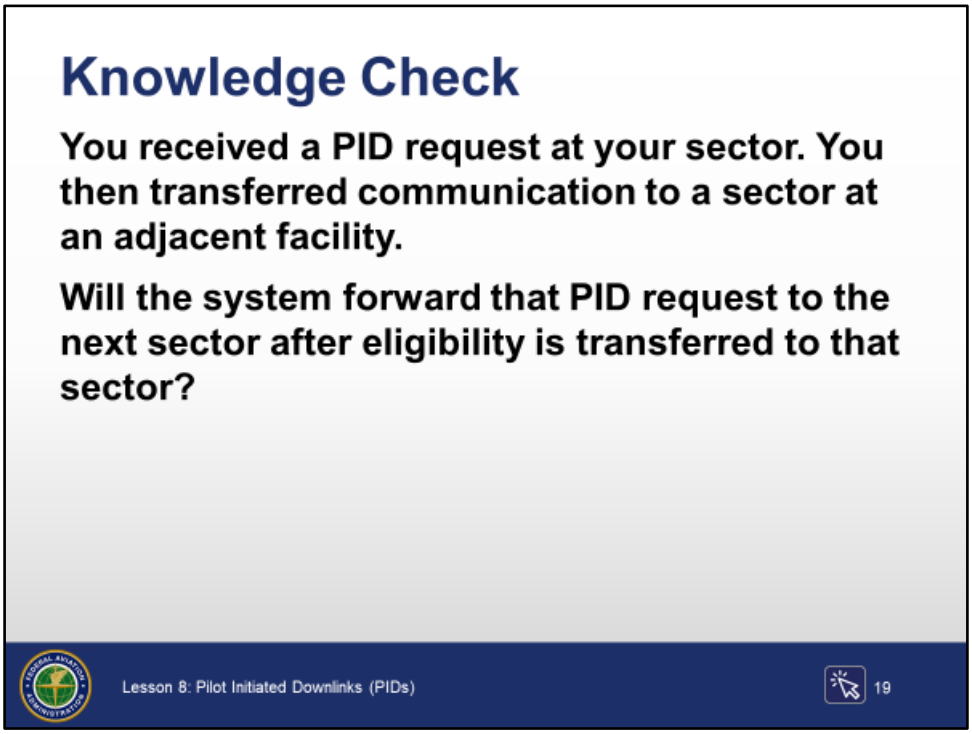



**Question:** What does the grayed out UPLINK pick area indicate?

***Answer:*** *There is an open Route uplink to this aircraft and the UPLINK response is not available*

# PILOT INITIATED DOWNLINK *(CONT'D)*

**Knowledge Check**

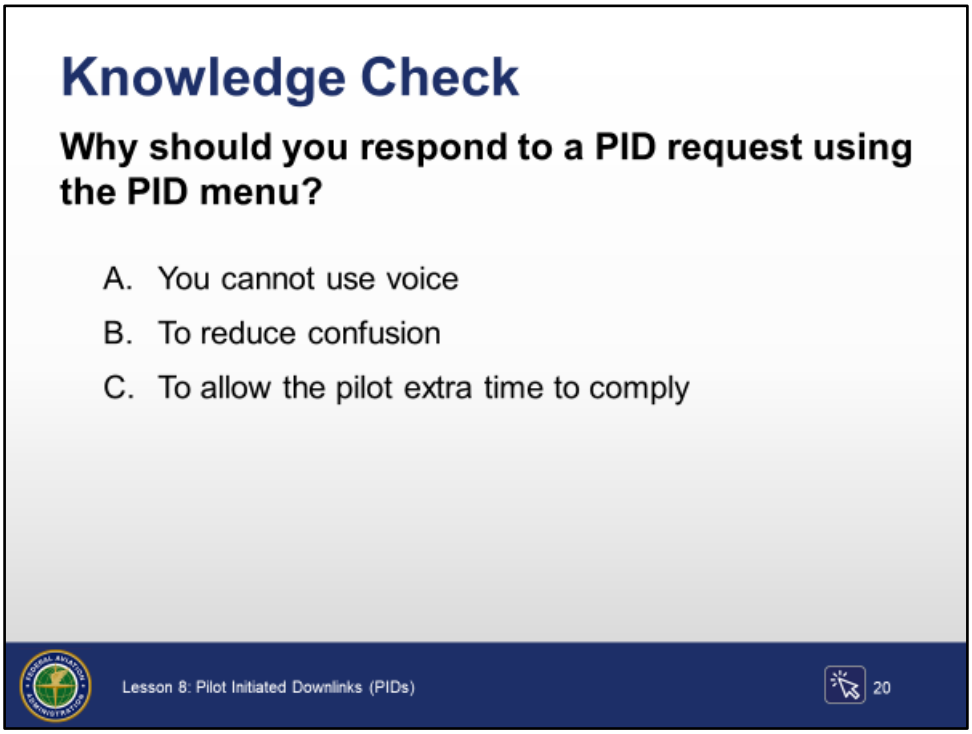



**Question:** You received a PID request at your sector. You then transferred communication to a sector at an adjacent facility.

Will the system forward that PID request to the next sector after eligibility is transferred to that sector?

***Answer:*** *No, the system will not forward PID requests across facilities. The system will automatically uplink an UNABLE, REQUEST AGAIN WITH NEXT ATC UNIT message.*

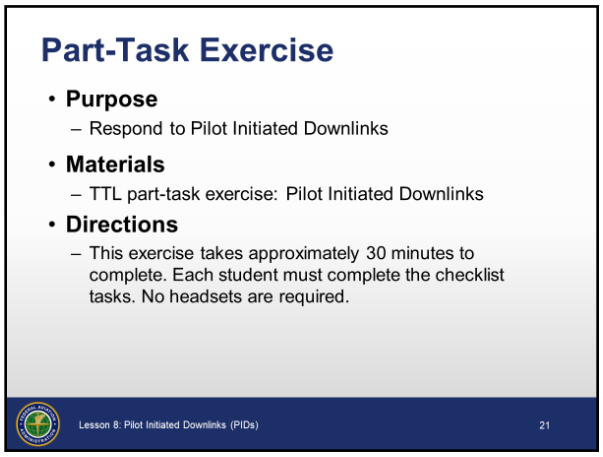
**Knowledge Check**




**Question:** Why should you respond to a PID request using the PID menu?

***Answer:*** *B. To reduce confusion*

# PART-TASK EXERCISE: PILOT INITIATED DOWNLINKS




**Purpose**

Respond to Pilot Initiated Downlinks.

**Materials**

Handout: *HO01_L08*

- TTL part-task exercise: Pilot Initiated Downlinks

TTL scenario*: 55054003_L08_S##*

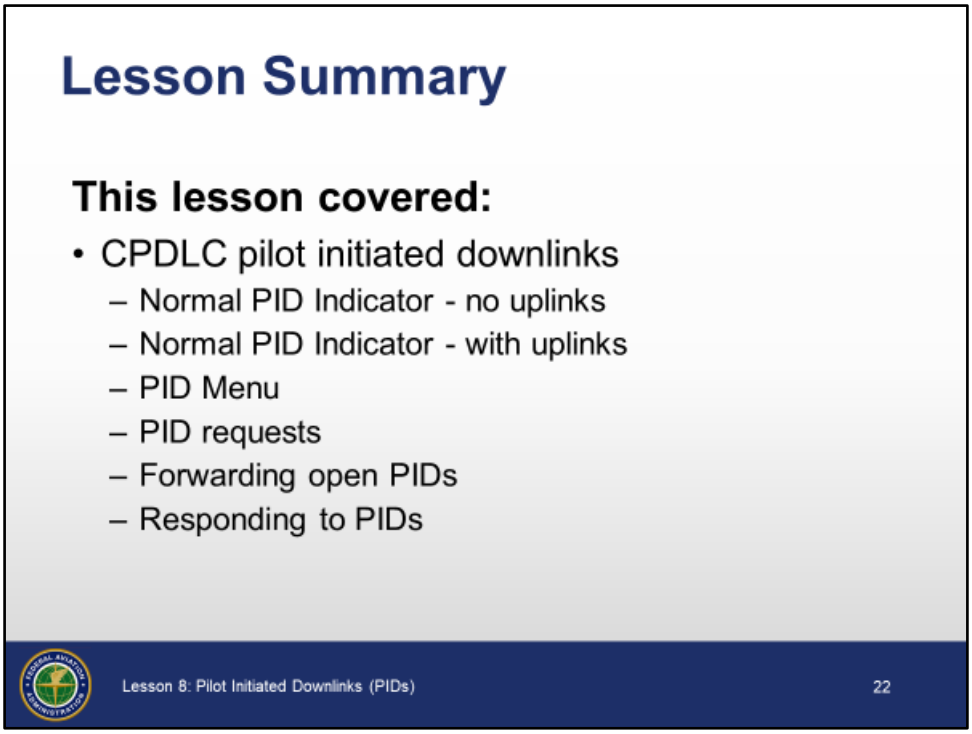
**Directions**

This exercise takes approximately 30 minutes to complete. Each student must complete the checklist tasks. No headsets are required.

*Provide instruction as required. Check off each task after completion. No ghost pilots are required.*

# CONCLUSION

**Lesson Summary**




*Review and elaborate briefly on the following topics. Ask students if they have questions about any of the concepts covered in the lesson.*

This Lesson covered:

- CPDLC pilot initiated downlinks
  - Normal PID Indicator - no uplinks
  - Normal PID Indicator - with uplinks
  - PID menu
  - PID Requests
    - Direct-to-Fix
    - Direct-to-Fix error
    - STANDBY sent
    - Uplink in progress

*Continued on next page*

# CONCLUSION *(CONT'D)*

**Lesson Summary (Cont'd)**

  - Special conditions
  - Altitude
  - Voice Contact
- Forwarding open PIDs
- Responding to PIDs

*Hand out and administer the End-of-Lesson Test. Provide feedback on missed items, including why particular answers are correct, as well as why some responses are incorrect.*