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

## **Lesson 2: Interpreting Ghost Pilot Displays**

**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	Interpreting Ghost Pilot Displays
Duration	1 Hour
Date Revised	May 2019
Version	V.2019-05
Software Compatibility	Microsoft Word, Power Point
Reference(s)	<ul style="list-style-type: none"><li>• TI 6110.106, ERAM Ghost Pilot Quick Reference Card</li><li>• TI 6110.154, ERAM ARTCC System Support Manual: Simulation User's Guide</li><li>• ATPilot Situational Display Data (SDD) User Manual</li></ul>
Handout(s)	None
Exercise(s)/ Activity(s)	Part Task Scenario 2
Assessments	End-of-course Knowledge and Performance Tests
Materials and Equipment	Projector
Other Pertinent Information	None



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

**Lesson 2**


**Interpreting Ghost Pilot Displays**

**Course FAA55149002**

05/2019



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## Lesson 2 Objective

**Given a Ghost Pilot Workstation and associated resources, the student will interpret information presented in the Ghost Pilot display in accordance with TI 6110.106, TI 6110.154, and ATPilot reference documentation.**

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## **Lesson 2 Topics**

- **Data Blocks**
- **Selected Aircraft Information Area (SAIA)**
- **Active Aircraft List (AAL)**
- **Future Aircraft List (FAL)**
- **Message Area/Role Play view**
- **CPDLC Message view**

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## Topic Introduction

### Data Blocks



- Data Block Components
- Check-in Indicator
- Voice Communication Indicator
- Attention Required Indicator
- CPDLC Indicators

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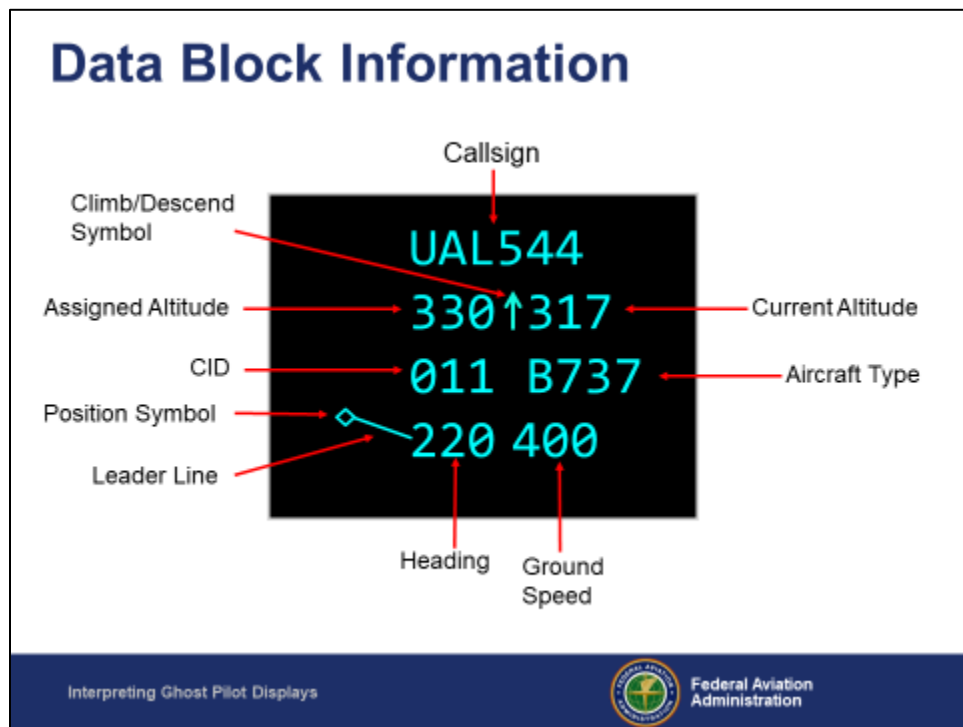


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A Data Block provides information about a target. This includes:

- Basic information such as callsign, altitude, speed and heading.
- Color coding to alert the Ghost Pilot to check-in via voice with the controller.
- Coding that indicates the aircraft has checked-in and the type of communication used (i.e., voice or digital message using Controller Pilot Data Link Communication, or CPDLC).
- Coding to alert the Ghost Pilot that an action must be taken.
- For CPDLC equipped aircraft, information about the status of CPDLC communications.

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The ATPilot Full Data Block, or FDB, is very similar to the FDB presented to controllers at the R-position. At the Ghost Pilot position, the term target label can refer to the FDB or LDB.

The target is identified by the FDB, a position symbol and a target label. There is also a leader line that connects the label FDB and position symbol.

The FDB provides the following information:

- Callsign
- Assigned altitude – If the assigned altitude is the only altitude displayed, the assigned and current altitudes are the same.
- Current altitude – Only if the current and assigned altitudes are different.
- A climb or descend arrow - Only if the current and assigned altitudes are different.
- Computer Identification number (CID)

- Aircraft type
  - Replaced by handoff indicators when the aircraft is in handoff status.
- Current heading
- Current ground speed

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### Check-In Required Indicator

AAL259  
350  
001 B738  
212 264

SWA254  
330  
005 B738  
190 274

Active Aircraft List

CID	CheckIn	ACID	Type/Bcn	Alt	DC	GPOCS	Hdg/Spd	FP Alt	Route
005	<input checked="" type="checkbox"/>	SWA254	B738	330		Session Established	190	330	FAK LVL ILM KMCO
001	<input checked="" type="checkbox"/>	AAL259	B738	350		Not equipped	212	350	RIC LVL KATL
000			B738	330		Session Established	190	330	FAK LVL ILM KMCO

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During actual air traffic operations, controllers instruct aircraft to contact the next sector's frequency after the next sector has accepted the handoff. The pilot will acknowledge the instruction, switch to the next sector's frequency, and transmit the aircraft's current altitude (if climbing or descending) and assigned altitude to the new controller. The entire process is called the Transfer of Communication. The initial communication with the new controller is referred to as checking-in.

A transfer of communication can be accomplished via voice or CPDLC. CPDLC equipped aircraft can either receive a CONTACT or MONITOR instruction when the transfer of communication message is uplinked.


- The Contact instruction requires the pilot to switch to the new frequency and check-in via voice.
- The Monitor instruction simply requires the pilot to switch to the new frequency. It is referred to as a silent check-in. The assumption is that CPDLC is the primary communication option.

A Data Block will change color to alert the Ghost Pilot that a voice check-in is required. The default Check-in Required indicator color is light green.


On the Active Aircraft List, there will be a checkmark in the CheckIn column if that column is being displayed.

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### Voice Communication Indicator (VCI)




**Green VCI with two arcs: GP had voice interaction with student controller.**



**White VCI with one arc: MONITOR TOC was replied to with Wilco and Ghost Pilot did not have voice interaction with student controller.**

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Once a check-in is completed, the data block will display a Voice Communication Indicator, or VCI.

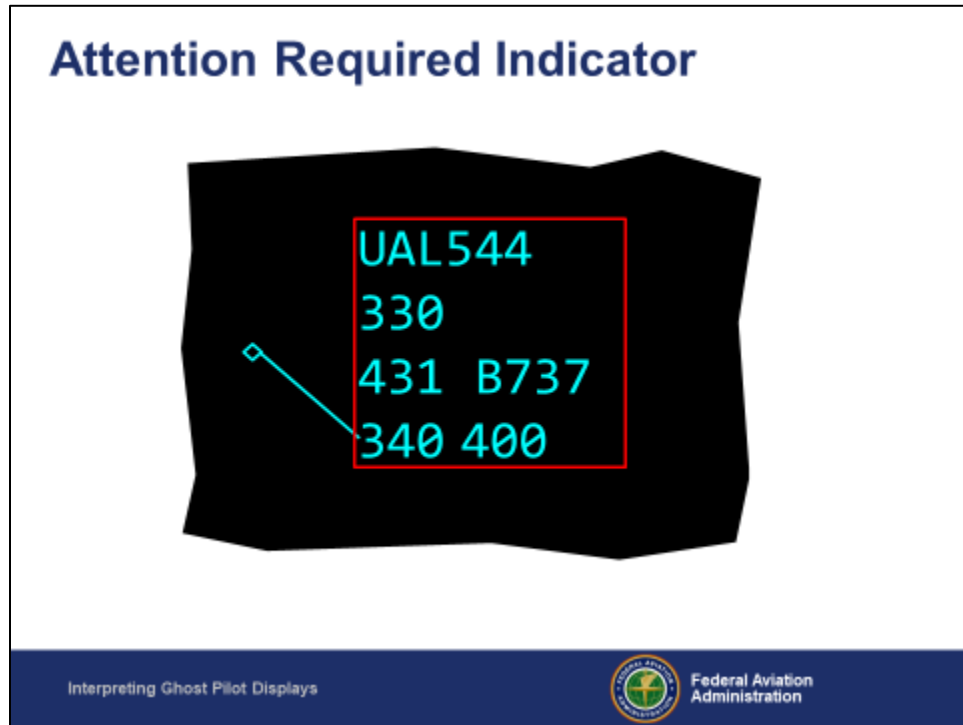
For voice check-ins, a Ghost Pilot must acknowledge that the check-in was completed (to be covered in a later lesson). When that happens a Manual VCI will be displayed next to the altitude. The Manual VCI is green and has two arcs.

For silent check-ins, an Auto VCI will appear once ATPilot sends a WILCO response to the MONITOR uplink. The Auto VCI is white with one arc.

The Ghost Pilot can remove a VCI from the data block by left clicking on the indicator. To redisplay a VCI, the Ghost Pilot must select the CheckIn option on the Target Control menu.

The VCI is automatically removed from the data block of CPDLC targets upon transmission of a WILCO response to a CONTACT or MONITOR message sent to the next sector/facility.

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An Attention Required indicator (ARI) will appear to alert the Ghost Pilot that an action or response is required. The indicator is a red square around the data block.

Various conditions trigger the display of the Attention Required indicator:

- There is a Ghost Pilot prompt for the target.
- The Ghost Pilot must manually respond to a CPDLC uplink.
- An automatic UNABLE message was sent in response to a CPDLC uplink.
- A CPDLC route uplink with a STAR was received and requires review, and possibly revision, by the Ghost Pilot.

These conditions will be covered in later lessons.

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## Knowledge Check

What does the green coding indicate?



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## Knowledge Check

**What does the green indicator to the left of the altitude mean?**



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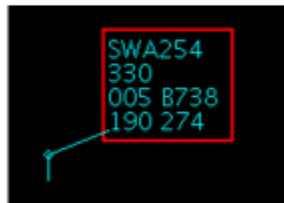


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## Knowledge Check

**What does the red square around the data block indicate?**

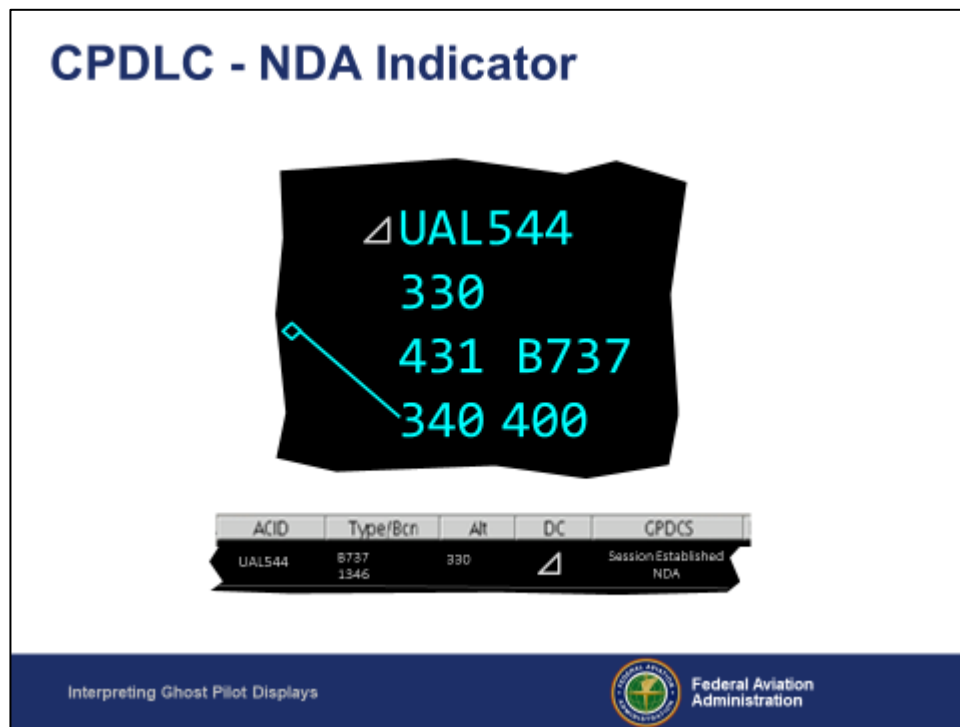


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The data block for CPDLC targets also provides information about the status of CPDLC communications.

A target with a Next Data Authority (NDA) session will display the NDA session indicator to the left of the callsign. The indicator is a white hollow triangle.

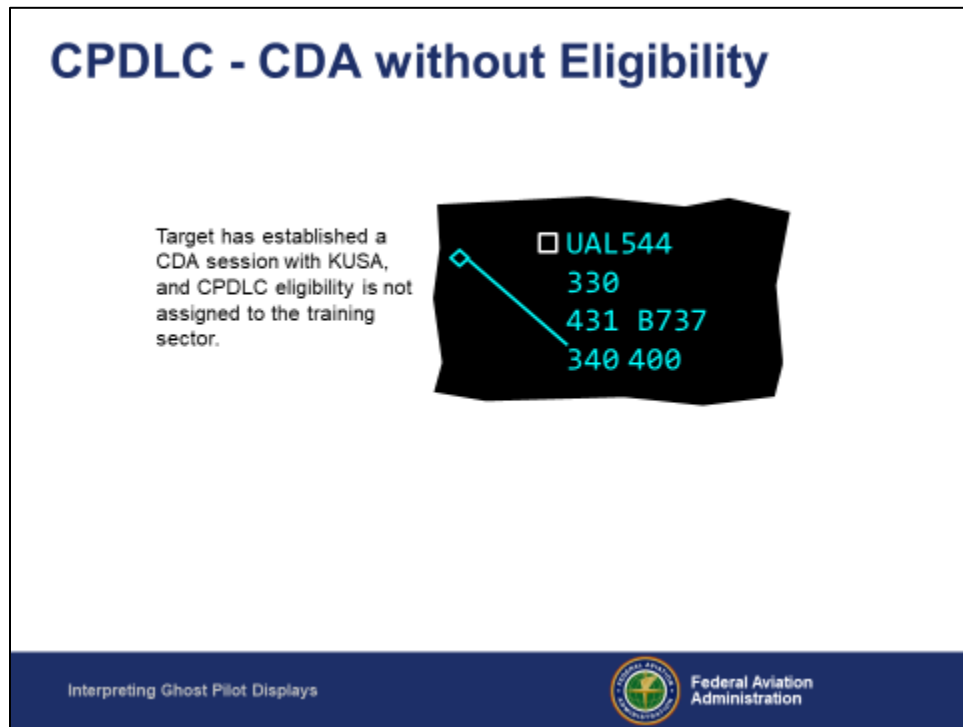
- A Next Data Authority (NDA) session means the aircraft has established a session in preparation for using CPDLC.

The NDA session indicator will also appear in the Active Aircraft List and Future Aircraft List if the DC (i.e., Data Comm) column is being displayed.

Ghost Pilots will normally see the NDA indicator in scenarios that include aircraft transitioning from Canadian or ATOP airspace to US airspace.

NDA indicators also appear when a CDPLC target first appears in a scenario and goes through the process of establishing a Current Data Authority (CDA) session.

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A target with a Current Data Authority (CDA) session will display the CDA session indicator to the left of the callsign.

- CDA means the aircraft has a session with KUSA.


The indicator is a white hollow square if the CDA session is established but the training sector is not the sector eligible to communicate with the aircraft via CPDLC.

Only one sector at a time may communicate with an aircraft via CPDLC.

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## CPDLC - CDA with Eligibility

Target has established a CDA session with KUSA, and CPDLC eligibility is assigned to the training sector.



■ UAL544  
330  
431 B737  
340 400

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The indicator for a CDA session with eligibility is a solid white square. Targets with this indicator can communicate with the training sector using CPDLC.

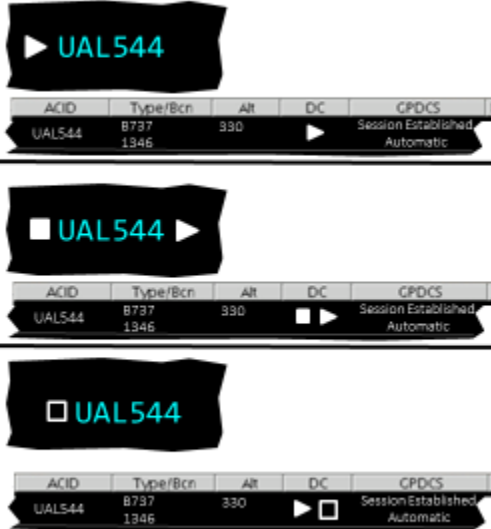
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## CPDLC - TOC Indicators

TOC in progress, target being transferred to training sector

TOC in progress from training sector to next sector/facility

TOC in progress, target being transferred between facilities and/or sectors other than the one assigned to GP




ACID	Type/Bcn	Alt	DC	CPDCS
UAL544	B737 1346	330	▶	Session Established Automatic

ACID	Type/Bcn	Alt	DC	CPDCS
UAL544	B737 1346	330	◻	Session Established Automatic

ACID	Type/Bcn	Alt	DC	CPDCS
UAL544	B737 1346	330	◻	Session Established Automatic

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Special coding is displayed during a CPDLC Transfer of Communication, also referred to as a TOC.

For targets inbound to the training sector, the CDA session without eligibility will be replaced by a TOC in progress indicator (i.e., a white right-pointing triangle). The same indicator is displayed on the AAL if the DC column is being displayed.


For targets outbound from the sector, a TOC in progress indicator appears to the right of the callsign. The same indicators are displayed on the AAL if the DC column is being displayed.

For targets neither inbound nor outbound, there is no TOC coding in the data block. The AAL will display a TOC in progress indicator and a CDA session without eligibility for this case.

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## Initial Contact (IC) in Progress Indicator


The target is assigned to the training sector, and there is a confirm assign altitude message in progress.



ACID	Type/Bcn	Alt	DC	CPDLC
UAL544	6737 1346	330	▶ ◻	Session Established Automatic


---

The target is not assigned to the training sector, and there is a confirm assign altitude message in progress.



ACID	Type/Bcn	Alt	DC	CPDLC
UAL544	6737 1346	330	▶ ◻	Session Established Automatic

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During a “silent” check-in, the system will automatically request that the pilot downlink their assigned altitude to confirm it matches the assigned altitude in ERAM. The CPDLC term for this is Initial Contact, or IC. Special coding is displayed to the controller if the altitudes do not match (IC Mismatch).


A controller can also manually uplink the altitude confirmation request.

An IC in progress indicator is shown, which consists of the right-pointing triangle next to the CDA indicator. The IC in progress indicator will remain until the altitude confirmation downlink is received.


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## Uplink in Progress Indicator


Displayed after target receives a Uplink Message, but before a response is sent.



The indicator shows a green triangle with a horizontal bar, followed by the text UAL544.

ACID	Type/Bcn	Alt	DC	CPDLC
UAL544	B737 1346	330		Session Established Automatic

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The Uplink in progress indicator is displayed from the time a target receives a CPDLC message from the controller. During this time, the uplink is considered to be open until the time a response is sent.



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## Normal PID Indicator


No uplink messages are waiting for a response and a PID request has been initiated.




ACID	Type/Bcn	Alt	DC	CPDCS
UAL544	8737 1346	330	▼	Session Established Automatic

---

An uplink message is waiting for a response and after a PID request has been initiated.



ACID	Type/Bcn	Alt	DC	CPDCS
UAL544	8737 1346	330	▼ ▲	Session Established Automatic

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Ghost Pilots may use CPDLC to request an altitude, direct routing to a fix on their current route (not necessarily flight plan route), or to use voice. The CPDLC term for this is a Normal Pilot Initiated Downlink, or PID.

The Normal PID in progress indicator is displayed from the moment the PID is sent to the moment a controller response is received.


The Normal PID in progress indicator appears next to the callsign if there are no open uplinks or to the left of the Uplink in progress indicator if an uplink is open.


The same coding is used in the AAL.

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### Emergency PID Indicator


Emergency PID sent and no Uplink Messages are waiting for a response.




ACID	Type/Bcn	Alt	DC	CPD/C
UAL544	8737 1346	330		Session Established Automatic


---

Emergency PID sent and an Uplink Message is waiting for a response.



ACID	Type/Bcn	Alt	DC	CPD/C
UAL544	8737 1346	330		Session Established Automatic

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Pilots may use CPDLC to downlink an emergency message to the controller. Examples include Mayday or request to deviate. The CPDLC term for this is an Emergency Pilot Initiated Downlink, or PID.

The Emergency PID in progress indicator is displayed the moment the Emergency PID is sent. The Ghost Pilot must acknowledge the emergency PID downlink entry in the CPDLC Message view to clear the indicator (covered in a later lesson).

The Emergency PID in progress indicator appears next to the callsign if there are no open uplinks or to the left of the Uplink in progress indicator if an uplink is open.


The same coding is used in the AAL.

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## Failed CPDLC Session Indicator

Can be:


- Ghost Pilot terminated
- Controller terminated
- System terminated



The image shows a black rectangular indicator with a red 'X' and the text 'UAL544' in green. Below this is a table with flight data.

ACID	Type/Bcr	Alt	DC	CPDLC
UAL544	8737 1346	330	X	Session Failed

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A pilot or controller can terminate a CPDLC session. There are also situations when the system terminates the session due to some abnormal condition. These are all considered a “Failed” session.

The Failed CPDLC Session indicator is displayed whenever a CPDLC session fails. The indicator is displayed for the remainder of the scenario unless a new session is successfully started.

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## Knowledge Check

What does the solid white square indicate?



UAL544  
330  
431 B737  
340 400

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## Knowledge Check

What does the yellow symbol to the left of the callsign indicate?



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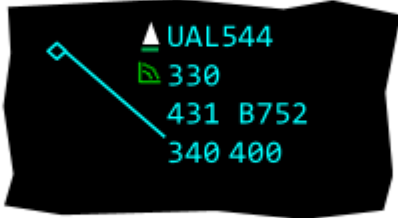


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## Knowledge Check

What does the symbol to the left of the callsign indicate?



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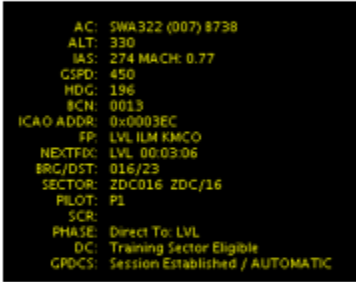


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## Topic Introduction

### Selected Aircraft Information Area (SAIA)



- Display/Hide SAIA
- SAIA Fields
- Interactive Fields

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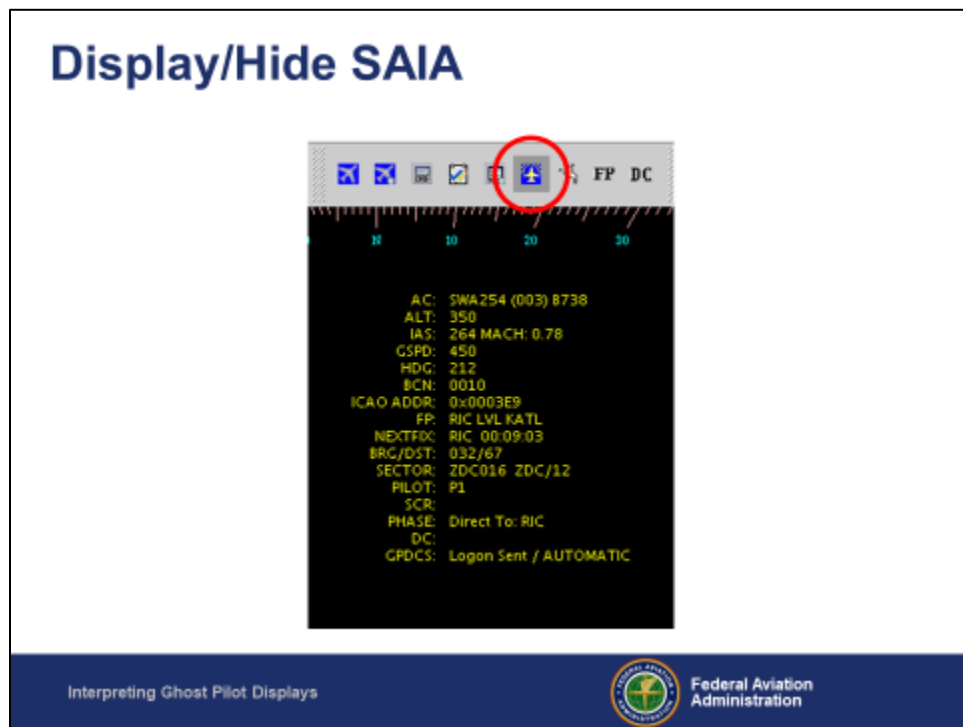
The Selected Aircraft Information Area (SAIA) provides information about the selected target. A target is selected by clicking on the callsign or on the target position symbol. The default color for a selected target is yellow.

The data in the SAIA updates dynamically.

In this section, we will cover:

- How to display or hide the view.
- The information provided in the view.
- The selectable fields available to perform target control tasks.

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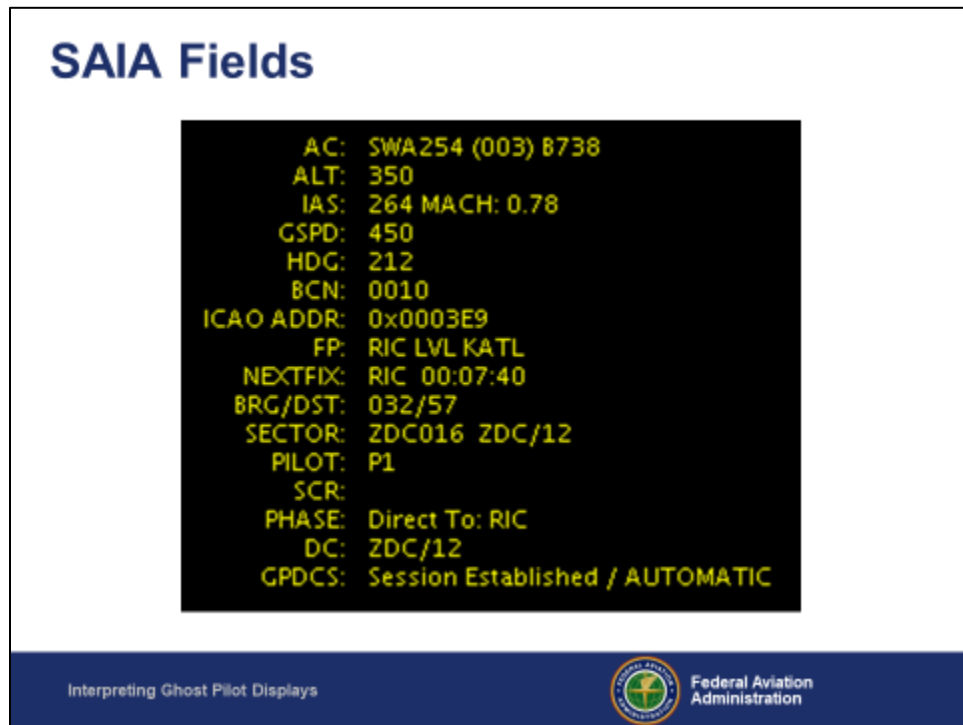
Click the SAIA icon on the Views toolbar to display or hide the SAIA. The icon has a gray outline when the view is displayed.

The SAIA will only be displayed while a target is selected.

The view can be moved by clicking-and-dragging any part of the view.



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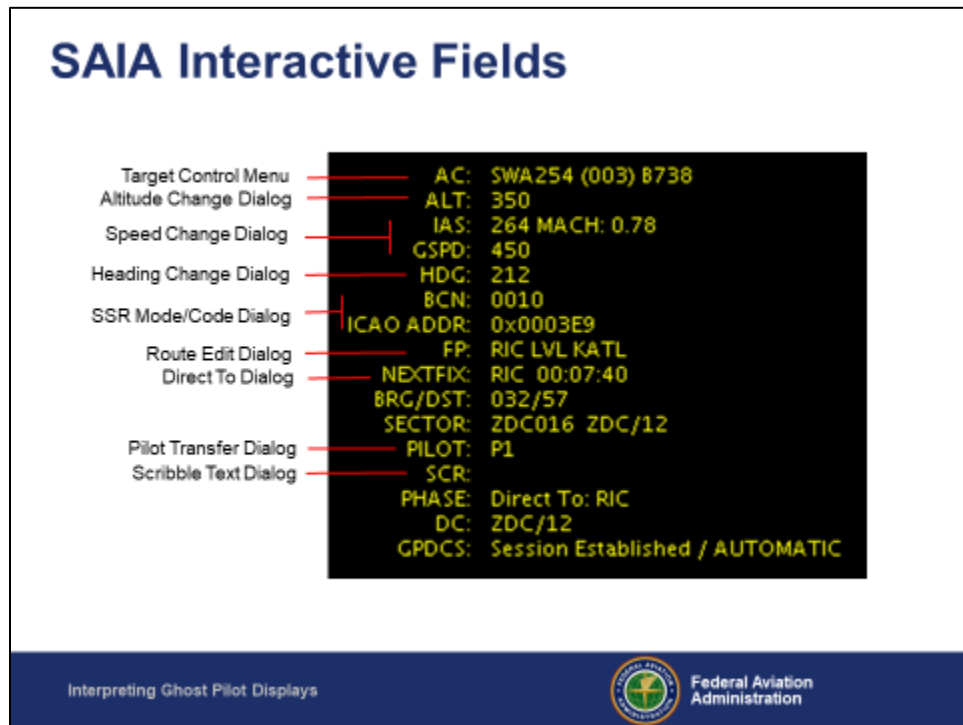


The SAIA view provides the following information:

AC	Aircraft callsign, the ERAM Computer Identification number (CID) assigned to the flight, and the aircraft type.
ALT	Assigned and current altitude in the same format as used in the data block.
IAS	Indicated Air Speed and Mach speed
GSPD	Ground speed
HDG	Heading
BCN	The beacon code being squawked
ICAO ADDR	The ICAO address, which is a unique identifier used by ERAM.
FP	The current ATPilot path the target is programmed to fly. This is equivalent to the route in an aircraft's Flight Management System (FMS) and not necessarily the same route as in the ERAM flight plan.
NEXTFIX	The next fix in the ATPilot route, and the estimated time of arrival there.
BRG/DST	The bearing and distance from the next fix on the flight plan to the target position symbol.

SECTOR:	The training sector and the sector currently with track control (if different from the training sector).
PILOT	The Ghost Pilot position number assigned to the target.
SCR	The Scribble field is a free text field that a Ghost Pilot can use to make notes. Click on the field to open the Scribble menu and enter the desired text.
PHASE	The phase of flight (i.e., Direct to, Departure, Landing, Hold).
DC	<p>The Data Comm field provides CPDLC session, eligibility, and activity information. The possible field content corresponds to the data block indicators previously described:</p> <ul style="list-style-type: none"><li>• Next Data Authority</li><li>• Facility/sector with eligibility (e.g., ZDC/12) - if not the training sector</li><li>• Training Sector Eligible</li><li>• TOC from Training Sector</li><li>• TOC to Training Sector</li><li>• TOC in Progress</li><li>• IC in Progress by Training Sector</li><li>• IC in Progress</li><li>• Uplink in Progress</li><li>• Downlink in Progress</li><li>• Uplink + Downlink in Progress</li><li>• Pilot Terminated</li><li>• Session Terminated</li></ul>
GPDCS	<p>The Ghost Pilot Data Comm Status field provides CPDLC logon and response mode information. Possible logon states:</p> <ul style="list-style-type: none"><li>• Logon Sent</li><li>• No Logon Sent</li><li>• Session Established</li></ul> <p>There are three response modes:</p> <ul style="list-style-type: none"><li>• Automatic</li><li>• Manual</li><li>• NDA</li></ul> <p>The scenario developer sets the response mode for an entire scenario, but can also do so for a target. A Ghost Pilot can also set the response mode for a target. We will provide detail about response modes later in this lesson.</p>

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In addition to providing information, clicking on many of the fields will access dialogs used to perform target control tasks. For example, clicking on ALT will open the Altitude Change dialog used to change a target's altitude.

Right-clicking on the callsign will bring up the Target Control menu.

Use of these dialogs is covered in later lessons.

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## Knowledge Check

**Which facility and sector is currently assigned CPDLC eligibility?**

```
AC: SWA254 (003) 8738
ALT: 350
IAS: 264 MACH: 0.78
GSPD: 450
HDC: 212
BCN: 0010
ICAO ADDR: 0x0003E9
FP: RIC LVL KATL
NEXTFD: RIC 00:07:40
BRG/DST: 032/57
SECTOR: ZDC016 ZDC/12
PILOT: P1
SCR:
PHASE: Direct To: RIC
DC: ZDC/12
GPDCS: Session Established / AUTOMATIC
```

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## Knowledge Check

**Does the FP field contain the route the target will fly or the ERAM Flight Plan route?**

```
AC: SWA254 (003) 8738
ALT: 350
IAS: 264 MACH: 0.78
GSPD: 450
HDG: 212
BCN: 0010
ICAO ADDR: 0x0003E9
FP: RIC LVL KATL
NEXTFIX: RIC 00:07:40
BRG/DST: 032/57
SECTOR: ZDC016 ZDC/12
PILOT: P1
SCR:
PHASE: Direct To: RIC
DC: ZDC/12
GPDCS: Session Established / AUTOMATIC
```

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## Topic Introduction

### Active Aircraft List (AAL)



ACID	Checklist	Type/Ver	Alt	DC	GPDS	H33/Ver	PP Alt	Pos
AAL259	8728 0001	250			Not equipped	212 264	250	RIC LVL KATL
AAL260	8728 0002	250			Not equipped	212 264	250	RIC LVL KATL
DWA254	8728 0010	250			Session Established	212 Automatic	250	RIC LVL KATL
DWA261	8728 0011	250		ZDC/12	Session Established	212 Automatic	250	RIC LVL KATL

- Display/Hide AAL
- AAL Fields
- Scribble Field
- Other Unique Interactive Fields

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The Active Aircraft List (AAL) provides much of the same information as the SAIA but includes all active targets in the scenario. The data in the AAL updates dynamically.

In this section, we will cover:

- How to display or hide the view.
- The information provided in the view.
- How to use the Scribble field.
- The unique fields available to perform target control tasks.

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## Display/Hide AAL

The screenshot shows the 'Active Aircraft List' window. The toolbar at the top of the window has a red circle around the AAL icon. The table below shows the following data:

CID	Checks	ACD	Scribble	Type/Icon	Alt	DC	GFDOS	Hdg/Cpd	FP Alt	Route
003	0 1	SWA254		B738 0010	350		Session Established Automatic	225 264	350	LVL KATL
001	0 1	AAL259		B738 0001	350		Not equipped	211 264	350	RC LVL KATL
004	0 1	SWA261		B738 0011	350	2DC/12	Session Established Automatic	212 264	350	RC LVL KATL
005	0 1	AAL260		B738 0002	350		Not equipped	212 264	350	RC LVL KATL
006	0 1	SWA268		B738 0012	350	2DC/12	Session Established Automatic	212 264	350	RC LVL KATL
007	0 1	AAL261		B738 0005	350		Not equipped	212 264	350	RC LVL KATL

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Click the AAL icon on the Views toolbar to display or hide the AAL. The icon has a gray outline when the view is displayed.

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### AAL Fields

The screenshot shows the 'Active Aircraft List' window. It contains a table with columns: CID, Checks, ACID, Type/Bcn, Alt, DC, GPDCS, Hdg/Spd, FP Alt, and Route. A context menu is open over the table, listing various fields that can be displayed or hidden, such as CID, ACID, Scribble, Type/Bcn, Alt, FP Alt, Hdg/Spd, IR, Checkin, Route, Next Fix, Pilot, Phase, Bcn, Hdg, IAS, Dep, ICAO Address, MACH, DC, GPDCS, and a 'Show/Hide...' option.

CID	Checks	ACID	Type/Bcn	Alt	DC	GPDCS	Hdg/Spd	FP Alt	Route
001	0 0	AAL259	8738 0001	350	---	Not equipped	144 264	350	HPF
006	0 0	SWA288	8738 0012	330	■	Session Established Automatic	196 274	330	LVL
002	0 0	AAL286	8738 0002	350	---	Not equipped	211 264	350	RIC
007	0 0	SWA322	8738 0013	330	ZDC/12	Session Established Automatic	190 274	330	FAR
008	0 0	AAL313	8738 0003	350	---	Not equipped	212 264	350	RIC
009	0 1	SWA356	8738 0014	330	ZDC/32	Session Established Manual	190 274	330	FAR
010	0 1	AAL340	8738 0004	350	---	Not equipped	212 264	350	RIC
011	0 1	SWA390	8738 0015	330	▲	Session Established NDA	190 274	330	FAR

The AAL view provides the following information:

- CID** The ERAM Computer Identification number (CID) assigned to the flight.  
Below the CID are two numbers. The one on the left is the number of pending commands awaiting execution (pending commands are covered in a later lesson). The one on the right is the number of Ghost Pilot prompts remaining.
- ACID** Aircraft callsign
- SCRIBBLE** The Scribble field is a free text field that a Ghost Pilot can use to make notes. Click on the field to open the Scribble menu and enter the desired text.
- TYPE/BCN** Aircraft type and beacon code being squawked.
- ALT** Current altitude
- FP ALT** Assigned altitude
- HDG/SPD** The current heading and indicated air speed together in one column. The heading is in the first row, the indicated air speed is below it.



IR	An indicator that the target was an independent release target. Scenario developers choose whether a target starts automatically or requires manual activation by the Ghost Pilot. Independent Release is the term for targets that require manual activation by the Ghost Pilot.
CHECKIN	An indicator to alert the Ghost Pilot that they must check in with the training sector via voice (equivalent to color-coding in the data block).
ROUTE	The current ATPilot path the target is programmed to fly. This is equivalent to the route in an aircraft's Flight Management System (FMS) and not necessarily the same route as in the ERAM flight plan.
NEXTFIX	The next fix in the ATPilot route, and the estimated time of arrival there.
PILOT	The Ghost Pilot position number assigned to the target.
PHASE	The phase of flight (i.e., Direct to, Departure, Landing, and Hold).
BCN	The beacon code being squawked by the target.
HDG	Heading
IAS	Indicated Air Speed
DEP	Departure airport
ICAO ADDR	The ICAO address, which is a unique identifier used by ERAM.
MACH	Mach speed
DC	The Data Comm field provides CPDLC session, eligibility, and activity information. The possible field content corresponds to the data block indicators previously described.
GPDCS	<p>The Ghost Pilot Data Comm Status field provides CPDLC logon and response mode information. Possible logon states:</p> <ul style="list-style-type: none"><li>• Logon Sent</li><li>• No Logon Sent</li><li>• Session Established</li></ul> <p>Three response modes can be assigned to each CPDLC target:</p> <ul style="list-style-type: none"><li>• Automatic</li><li>• Manual</li><li>• NDA</li></ul> <p>“Not equipped” will be displayed if the target is not CPDLC equipped.</p>

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### CPDLC Response Modes

CID	Checks	ACD	Type/Bos	Alt	DC	CPDLC	Hdg/Spd	FP Alt	Route
001	0	AAL259	8738 0001	350		Not equipped	144 264	350	HPW HCM ORF KATL
006	0	SWA288	8738 0012	330		Session Established Automatic	156 274	330	LVL ILM KMCO
002	0	AAL286	8738 0002	350		Not equipped	211 264	350	RIC LVL KATL
007	0	SWA322	8738 0013	330	ZDC/12	Session Established Automatic	190 274	330	FAK LVL ILM KMCO
008	0	AAL313	8738 0003	350		Not equipped	212 264	350	RIC LVL KATL
009	0	SWA356	8738 0014	330	ZDC/32	Session Established Manual	190 274	330	FAK LVL ILM KMCO
010	0	AAL340	8738 0004	350		Not equipped	212 264	350	RIC LVL KATL
011	0	SWA390	8738 0015	330		Session Established NDA	190 274	330	FAK LVL ILM KMCO

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As mentioned, a CPDLC target can be in one of three CPDLC response modes.

- Automatic
- Manual
- NDA

In Automatic mode, the Ghost Pilot will not need to respond to CPDLC messages. ATPilot will do it. This is the most typical response mode.

When an uplink is received, ATPilot will automatically derive the ATCoach target control command to comply with the uplink, and send a response.

- ATCoach will validate the command, and if the command can be executed, a WILCO or ROGER response will be downlinked. The ATCoach command will then be executed.
- If the command validation fails, an UNABLE response will be downlinked and the command will not be executed.
  - An Attention Required Indicator will be displayed and the Ghost Pilot should expect the controller to contact them via voice.

If the response mode is set to Manual, the Ghost Pilot will need to manually respond to the uplink and execute the command.

- ATPilot will automatically derive the ATCoach target control command to comply with the uplink, but will not send a response.
- ATCoach will not validate the generated target control command.
- The best practice is to manually execute the command (e.g. crossing restriction), then manually send the appropriate response:
  - WILCO if the command executed.
  - UNABLE if the command was rejected.

This is to ensure that the aircraft can perform the command entered.

The process for manually responding to a CPDLC uplink will be covered in a later lesson.

If the response mode is set to NDA, ATCoach will automatically respond to any uplink with an error at the controlling sector.

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# Scribble

Click on the Scribble field for the desired target

QID	Checks	ACID	Scribble	Type/Esc	Alt	DC	GRCS	Height/Spd	PP Alt	Route
000	0 1	SWA254		8718 0010	350		Session Established Automatic	225 264	350	U/L KATL
001	0 1	AAL259		8718 0001	350		Not equipped	211 264	350	RIC LVL KATL
004	0 1	SWA261		8718	350	ZDC/12	Session Established Automatic	212 264	350	RIC LVL KATL
005	0 1	AAL260					Not equipped	212 264	350	RIC LVL KATL
006	0 1	SWA268				ZDC/12	Session Established Automatic	212 264	350	RIC LVL KATL
007	0 1	AAL261					Not equipped	212 264	350	RIC LVL KATL

Interpreting Ghost Pilot Displays

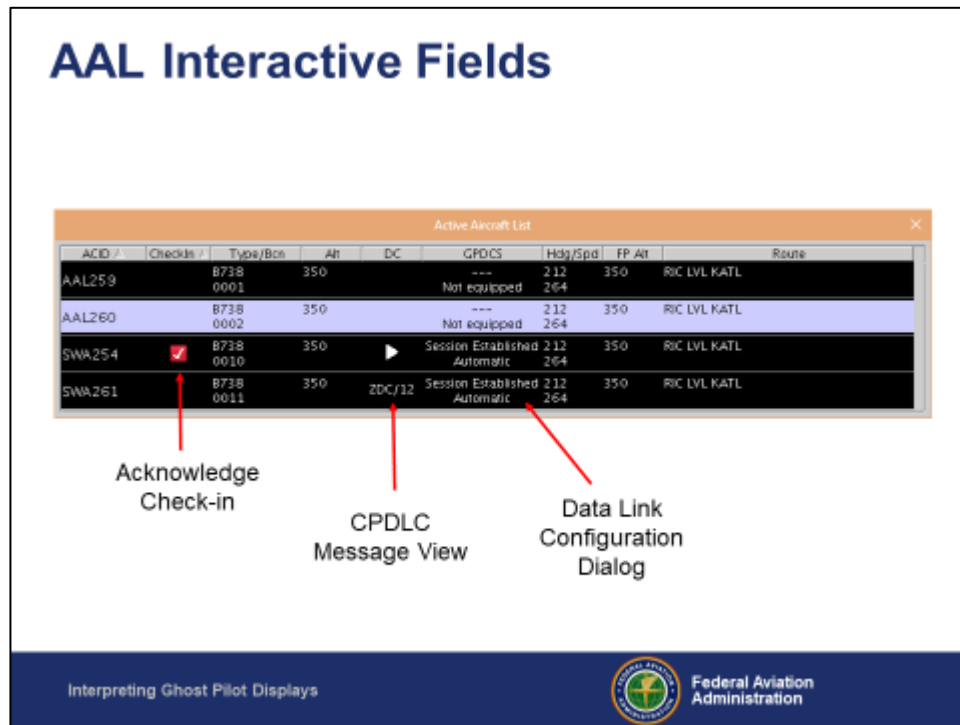
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The Scribble field is available for the Ghost Pilot to make notes about a target.

To add Scribble text:

1. Click on the Scribble field for the desired target. The Scribble Text dialog will appear.
2. Enter the desired text in the input area.
3. Click **Ok**.

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The same interactive fields available in the SAIA are available in the AAL. For example, clicking on the Alt field for a given target will open the Altitude Change dialog for that target.

In addition, there are four interactive fields in the AAL that are not interactive in the SAIA.

- Click on the ACID of the desired target to display the Target Control menu. If there is an unacknowledged prompt for that target, the Prompt List view will be displayed instead.
- Click on the Check-in indicator of the desired target to acknowledge the voice check-in was completed.
- Click on the DC field of the desired target to open the CPDLC Message view.
- Click on the GPDCS field of the desired target to open the Data Link Configuration dialog.

Use of these views and dialogs is covered in later lessons.

Slide - 36.

## Knowledge Check

**What does the checkmark next to SWA254 indicate?**

ACID /	Checkin /	Type/Bon	Alt	DC	GPDOS	Hdg/Spd	FP Alt	Route
AAL259	B738 0001	350			Not equipped	212 264	350	RIC LVL KATL
AAL260	B738 0002	350			Not equipped	212 264	350	RIC LVL KATL
SWA254	B738 0010	350		▶	Session Established Automatic	212 264	350	RIC LVL KATL
SWA261	B738 0011	350		ZDC/12	Session Established Automatic	212 264	350	RIC LVL KATL

Interpreting Ghost Pilot Displays

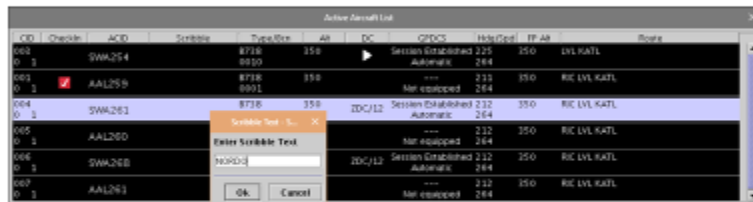


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Slide - 37.

## Knowledge Check

How do you open the Scribble Text box?




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Slide - 38.


## Topic Introduction

### Future Aircraft List (FAL)



ID	Altitude	Heading	Speed	Status	ACID
AAL323	8708	088	203	Not equipped	20:38:56 OTT RIC D/L P/ATL
AAL356	8708	088	203	Not equipped	20:38:56 CON TAB D/L D/L R/CO
AAL340	8708	088	203	Not equipped	20:38:56 OTT RIC D/L P/ATL
AAL390	8708	088	203	Not equipped	20:38:56 CON TAB D/L D/L R/CO
AAL367	8708	088	203	Not equipped	20:38:56 OTT RIC D/L P/ATL
AAL424	8708	088	203	Not equipped	20:38:56 CON TAB D/L D/L R/CO

- Display/Hide FAL
- FAL Fields
- Additional Functions in ACID Field

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The Future Aircraft List (FAL) provides much of the same information as the AAL. The entries in the list are for targets that will be activated later in the scenario. The data in the FAL updates dynamically.

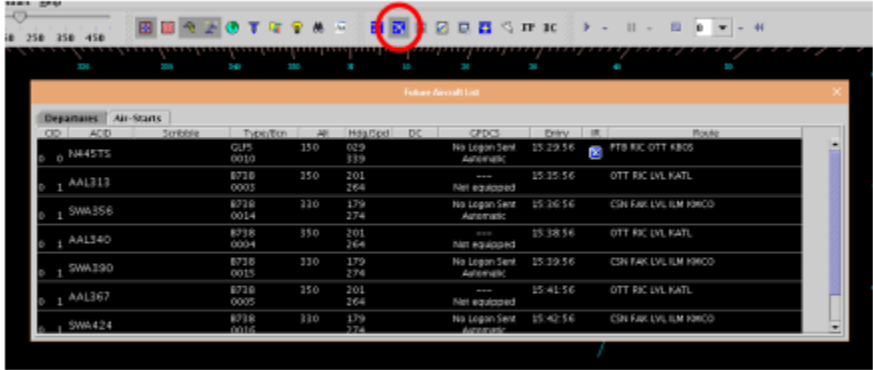
In this section we will cover:

- How to display or hide the view.
- The information provided in the view.
- Target control functions available via the ACID field.




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## Display/Hide FAL



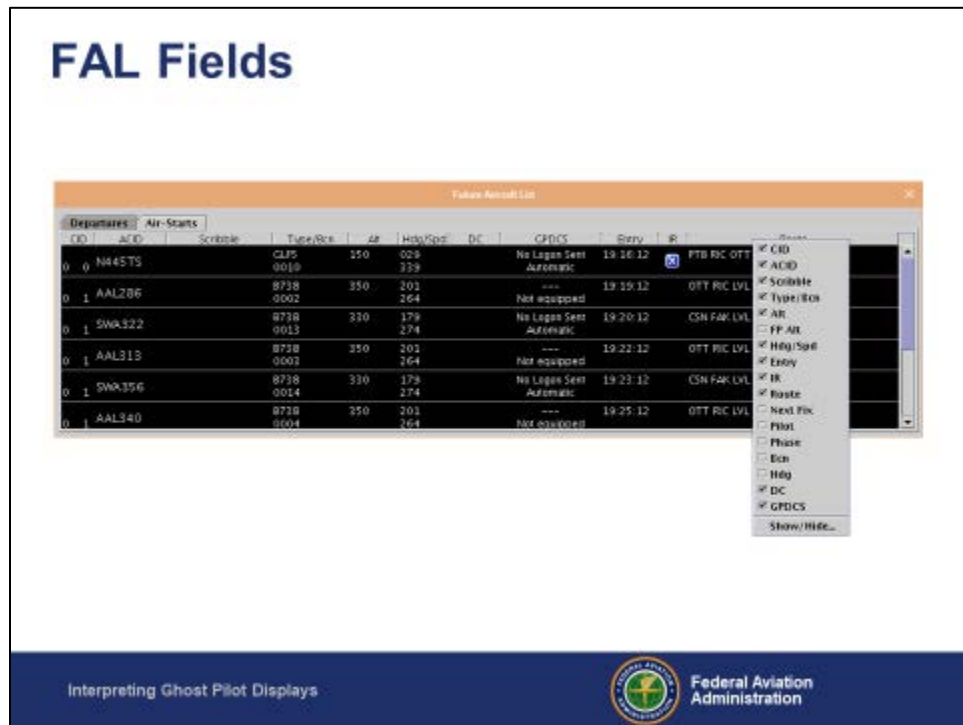
The screenshot shows the 'Future Aircraft List' window in X-Plane 11. The window displays a table of aircraft with columns for ID, ACD, Type/To, Alt, Hdg/Crcl, DC, CPD/C, Entry, and Route. The table lists several aircraft, including 10445TS, AAL313, GWA356, AAL340, GWA390, AAL367, and GWA424. The 'FAL' icon in the top toolbar is highlighted with a red circle, indicating it is the button used to toggle the display of the Future Aircraft List.

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Click the FAL icon on the Views toolbar to display or hide the FAL. The icon has a gray outline when the view is displayed.

Slide - 40.



The FAL view has two tabs. The Departures tab contains all targets that will be departing from an airport. The Air-Starts tab contains all targets that will start already in flight. The slide shows the Air-Starts tab selected.

The available fields in the FAL are as follows:

**CID** The ERAM Computer Identification number (CID) assigned to the flight. No CIDs are displayed in the FAL because the flight is not active.

The second row of the CID field contains two numbers. The one on the left is the number of pending commands awaiting execution (pending commands are covered in a later lesson). The one on the right is the number of Ghost Pilot prompts remaining.

**ACID** Aircraft callsign

**SCRIBBLE** The Scribble field is a free text field that a Ghost Pilot can use to make notes.

**TYPE/BCN** Aircraft type and beacon code being squawked.

**ALT** Current altitude at the time the target starts.

**FP ALT** Assigned altitude

HDG/SPD	The heading and indicated air speed at the time the target starts together in one column. The heading is in the first row, the indicated air speed is below it.
ENTRY	The time the target will start.
IR	<p>An indicator that the target is an independent release target. Scenario developers choose whether a target starts automatically or requires manual activation by the Ghost Pilot. Independent Release is the term for targets that require manual activation by the Ghost Pilot.</p> <ul style="list-style-type: none"><li>• An example of an independent release is a target departing from an uncontrolled airport. Since the departure is dependent on a controller clearance, the exact departure time is not known. The Ghost Pilot must manually activate the target after the clearance is received.</li></ul>
ROUTE	The current ATPilot path the target is programmed to fly. This is equivalent to the route in an aircraft's Flight Management System (FMS) and not necessarily the same route as in the ERAM flight plan.
NEXTFIX	The next fix in the ATPilot route, and the estimated time of arrival there.
PILOT	The Ghost Pilot number assigned to the target.
PHASE	The phase of flight (e.g., Direct to, Approach, Hold).
BCN	The beacon code the target will squawk.
HDG	Heading at the time the target starts.
DC	The Data Comm field provides CPDLC session, eligibility, and activity information. The possible field content corresponds to the data block indicators previously described.
GPDCS	<p>The Ghost Pilot Data Comm Status field provides CPDLC logon and response mode information. Possible logon states:</p> <ul style="list-style-type: none"><li>• Logon Sent</li><li>• No Logon Sent</li><li>• Session Established</li></ul> <p>Three response modes can be assigned to each CPDLC target:</p> <ul style="list-style-type: none"><li>• Automatic</li><li>• Manual</li><li>• NDA</li></ul> <p>“Not equipped” will be displayed if the target is not CPDLC equipped.</p>

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### Activate an Independent Release

Click on ACID field then Activate to "release" flight

Departure	Air-Starts	Scribble	Type/Rce	Alt	Hdg/Crs	DC	CPD/Cs	Entry	IR	Release
0 0 N4457	Activate		CLJ5	150	029		No Legas Sent Automatic	19 16:12		PTB RIC OTT KBO5
0 1 AAL31	ARTS DM Message... Drop...		8738	350	201		Not equipped	19 22:12		OTT RIC LVL KATL
0 1 SWA356			8738	320	179		No Legas Sent Automatic	19 23:12		CSN FAK LVL ILM KMCO
0 1 AAL340			8738	350	201		Not equipped	19 25:12		OTT RIC LVL KATL
0 1 SWA390			8738	320	179		No Legas Sent Automatic	19 26:12		CSN FAK LVL ILM KMCO
0 1 AAL367			8738	350	201		Not equipped	19 28:12		OTT RIC LVL KATL

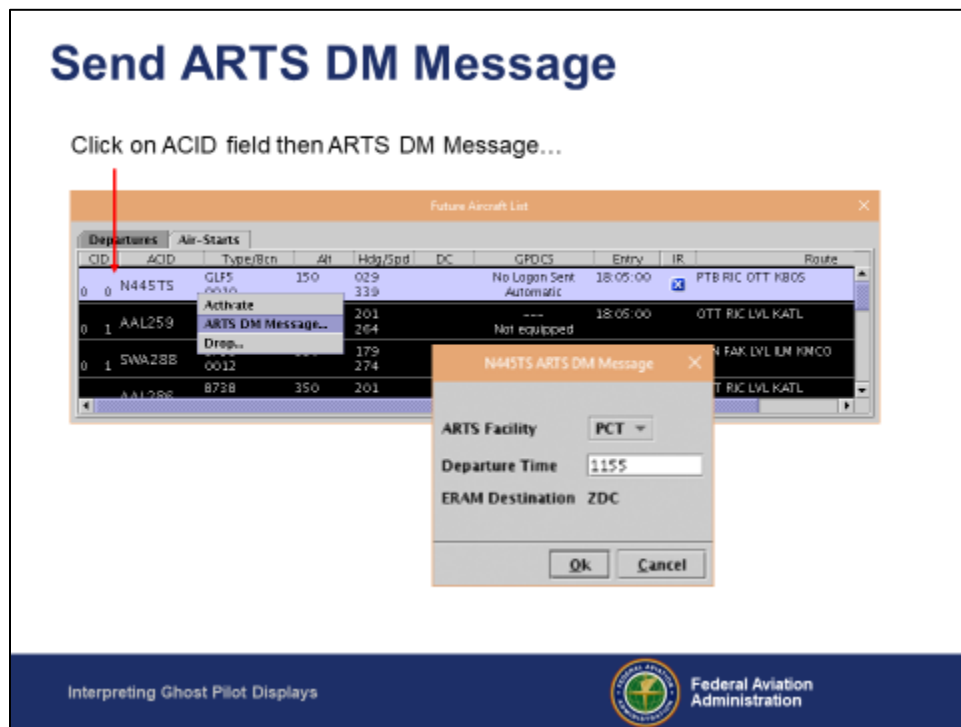
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The same interactive fields available in the SAIA and AAL are available in the FAL.

The FAL ACID is used to access a modified Target Control menu with three options:

- The **Activate** option will start an independent release target. It is grayed out for targets that start automatically. To activate an independent release target:
  1. Click on the ACID field to open the modified Target Control menu.
  2. Click on the **Activate** option.
- The **ARTS DM Message...** option is used to inject an ERAM departure message from the appropriate TRACON.
- The **Drop...** option is used to drop the target. The Drop function will be covered in a later lesson.

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To send an ARTS departure message:

1. Click on the ACID field to open the modified Target Control menu.
2. Click on the **ARTS DM Message ...** option. The ARTS DM Message dialog will open.
3. Use the **ARTS Facility** list menu to select the source facility.
4. Enter the desired departure time.
5. Click **Ok**.

### What information does the IR field provide?

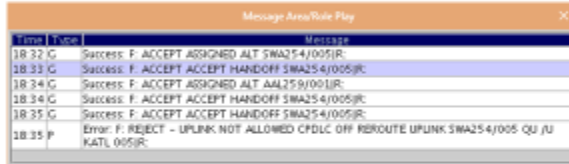
Passenger Aircraft List

Departure	Air-Status	Cabin	Seats	Passengers	Crew	Cargo	Flights	Remarks
0	HA4515	0000	000	000	000	000	10:10:10	No Legen Seat Automatic
0	AAAL266	0000	000	000	000	000	10:10:10	No Legen Seat Automatic
0	AAAL322	0000	000	000	000	000	10:10:10	No Legen Seat Automatic
0	AAAL313	0000	000	000	000	000	10:10:10	No Legen Seat Automatic
0	AAAL356	0000	000	000	000	000	10:10:10	No Legen Seat Automatic
0	AAAL340	0000	000	000	000	000	10:10:10	No Legen Seat Automatic

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### Topic Introduction


#### Message Area/Role Play View



Time	Type	Message
18 32 G	Success	F: ACCEPT ASSIGNED ALT SWA254/005JR
18 33 G	Success	F: ACCEPT ACCEPT HANDOFF SWA254/005JR
18 34 G	Success	F: ACCEPT ASSIGNED ALT AAL259/001JR
18 34 G	Success	F: ACCEPT ACCEPT HANDOFF SWA254/005JR
18 35 G	Success	F: ACCEPT ACCEPT HANDOFF SWA254/005JR
18 35 P	Error	F: REJECT - UPLINK NOT ALLOWED CPDLC OFF REROUTE UPLINK SWA254/005 QJ /U KATL 005JR

- Display/Hide
- Fields
- Deleting Messages

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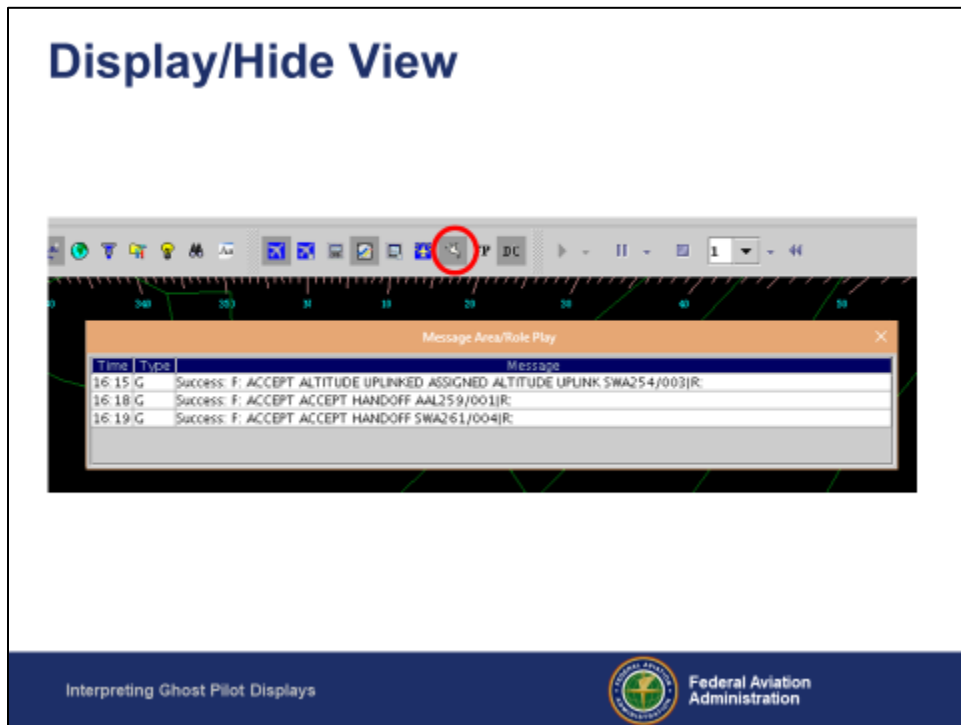
The Message Area/Role Play view serves three purposes:

- Display system messages.
- Provide access to a dialog used to enter ERAM commands.
- Provide access to a dialog used to send a text message to any other Ghost Pilot working the scenario.

In this section, we will cover:

- How to display or hide the view.
- The information provided in the view.
- The steps to delete messages from the view.

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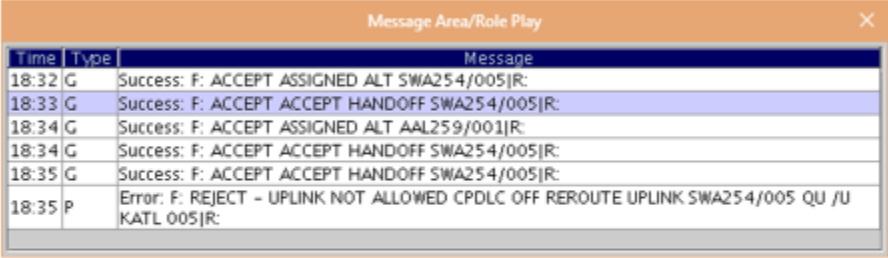


Click the Ghost icon on the Views toolbar to display or hide the Message Area/Role Play view. The icon has a gray outline when the view is displayed.




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### Fields



Time	Type	Message
18:32	G	Success: F: ACCEPT ASSIGNED ALT SWA254/005 R:
18:33	G	Success: F: ACCEPT ACCEPT HANDOFF SWA254/005 R:
18:34	G	Success: F: ACCEPT ASSIGNED ALT AAL259/001 R:
18:34	G	Success: F: ACCEPT ACCEPT HANDOFF SWA254/005 R:
18:35	G	Success: F: ACCEPT ACCEPT HANDOFF SWA254/005 R:
18:35	P	Error: F: REJECT - UPLINK NOT ALLOWED CPDLC OFF REROUTE UPLINK SWA254/005 QU /U KATL 005 R:

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The view contains three fields:

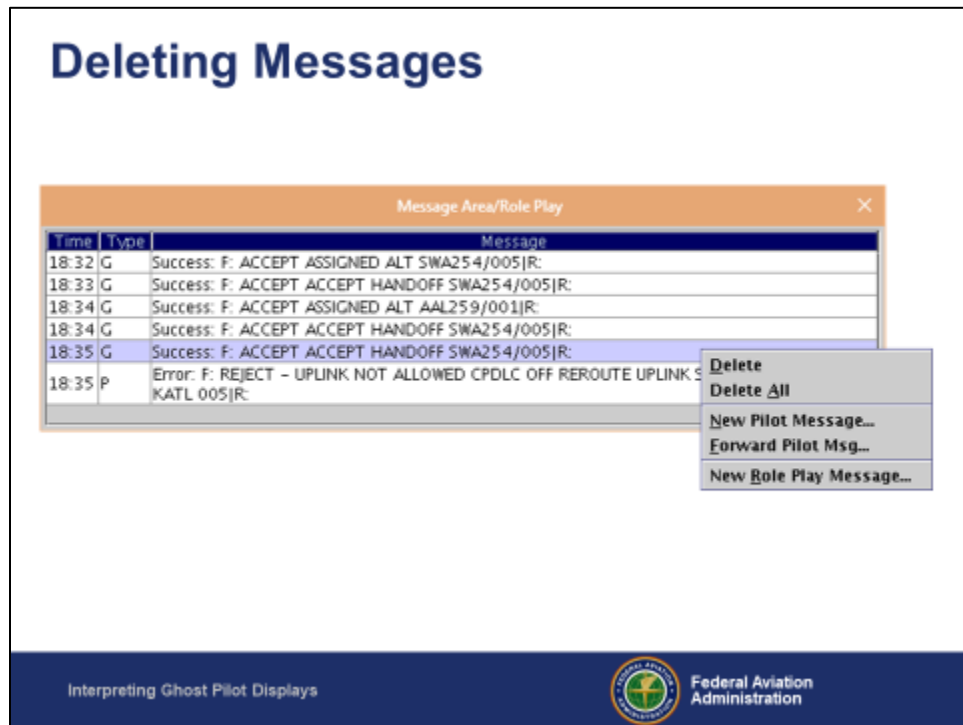
**TIME**            The time the message was generated.

**TYPE**            The type of message.

G            General  
P            Problem  
I            Information

**MESSAGE**    The message content.

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The Ghost Pilot can delete one or all messages displayed in the view. To delete one message:

1. Select the desired message.
2. Right-click anywhere in the view. A pop-up menu will be displayed.
3. Select the **Delete** option.

To delete all messages:

1. Right-click anywhere in the view. A pop-up menu will be displayed.
2. Select the **Delete All** option.

The pop-up menu has three additional options:

- The **New Pilot Message...** option opens a dialog used to send a text message to any other Ghost Pilot working the same scenario.
- The **Forward Pilot Msg...** option opens a dialog used to forward a text message to any other Ghost Pilot working the same scenario.
- The **New Role Play Message...** option is used to enter ERAM commands in order to simulate entries made by an adjacent sector/facility. This option will be covered in a later lesson.

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## Knowledge Check

**What button is used to open the Message Area/Role Play View?**



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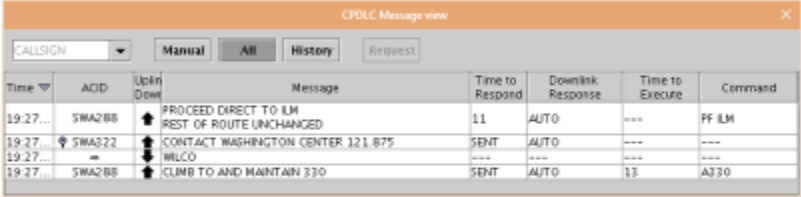


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### Topic Introduction

### CPDLC Message View



Time	AID	Uplink/Downlink	Message	Time to Respond	Downlink Response	Time to Execute	Command
19:27...	SWA288	↑	PROCEED DIRECT TO ILM REST OF ROUTE UNCHANGED	11	AUTO		FF ILM
19:27...	SWA222	↓	CONTACT WASHINGTON CENTER 121.875	SENT	AUTO		
19:27...		↓	WILCO				
19:27...	SWA288	↑	CLIMB TO AND MAINTAIN 330	SENT	AUTO	13	A330

- Display/Hide
- Buttons
- Fields

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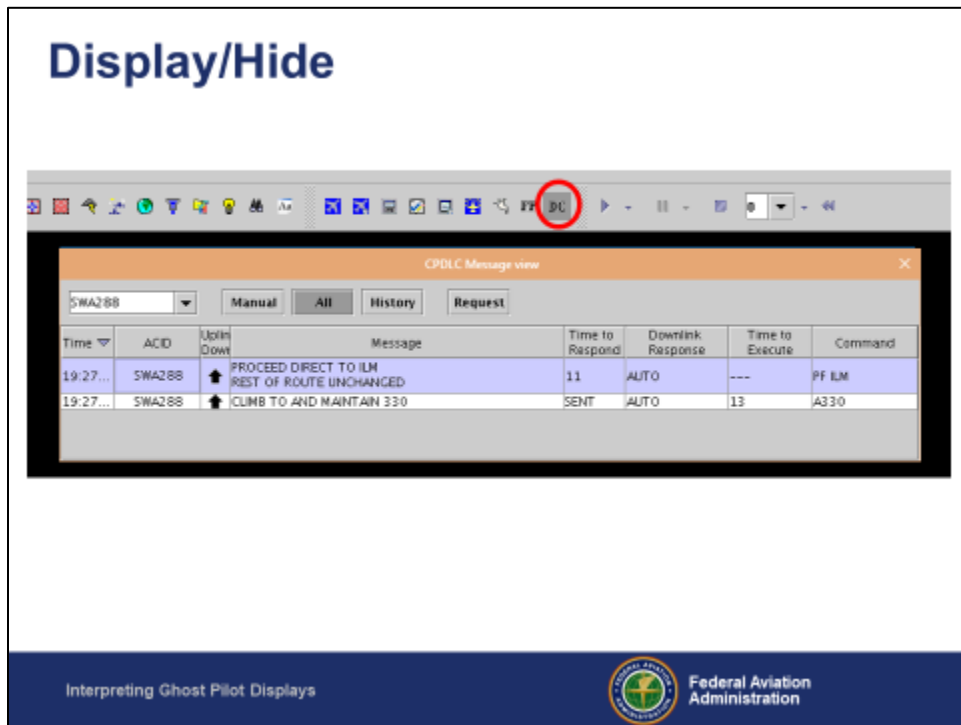
The CPDLC Message view is used to view the content and status of CPDLC uplinks and downlinks. It is also used to access a dialog to edit CPDLC response elements.

In this section we will cover:

- How to display or hide the view.
- The four buttons available in the view.
- The information provided in the view.

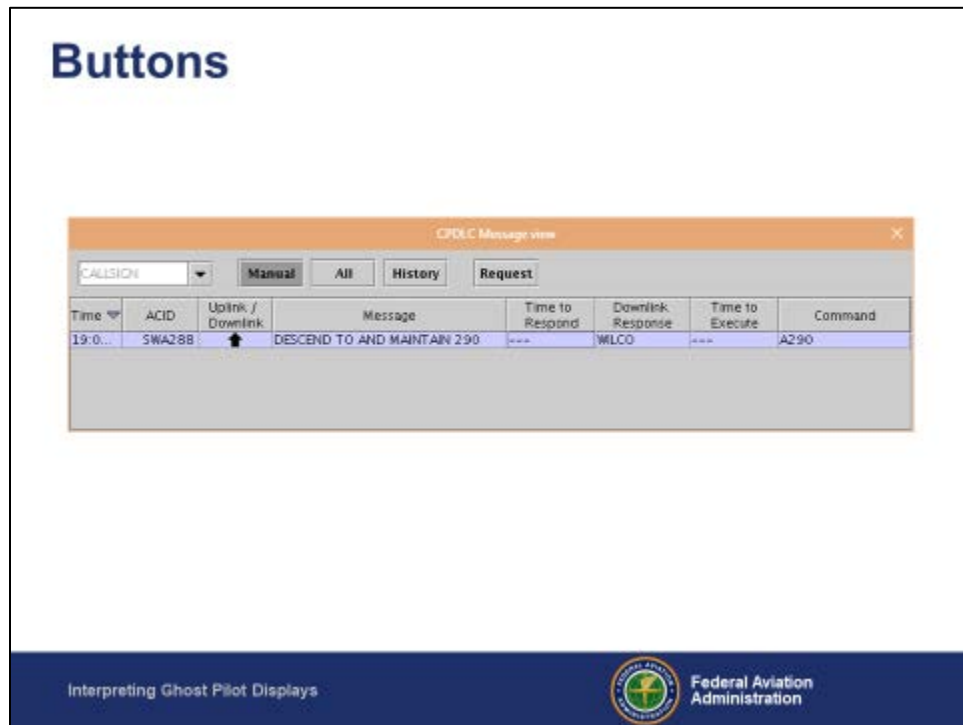
The steps for manually responding to a message are covered in a later lesson.

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Click the DC icon on the Views toolbar to display or hide the CPDLC Message view. The icon has a gray outline when the view is displayed.

Slide - 51.



The view contains four buttons.

The **Manual** button filters the view so only entries that require a manual response are displayed.

- Messages for targets in manual mode will be displayed at all Ghost Pilot positions regardless of assignment.

The **All** button is used to display all open uplinks/downlinks. An uplink is considered open until a response is sent and any associated ATCoach command is executed.

- Messages for targets in automatic mode will only be displayed at the Ghost Pilot position to which the target is assigned.

The **History** button is used to display all closed messages and any messages manually sent to the History page. Messages are considered closed after the response is sent and any associated ATCoach command executed.

- All messages are moved to the History page a short time after the response has been sent and any associated ATCoach command has been executed.

The **Request** button is used to open a dialog for creating Pilot Initiated Downlink (PID) requests. A target entry must be selected for the button to be active. This dialog will be covered in the next lesson.

The view also contains an input box used to filter the display so only entries for a specific target are shown. There are two ways to do this:

- Manually enter a callsign.
- Select a callsign from the dropdown list (all callsigns in the scenario).

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### Fields

CPDLC Message view

CALLSIGN
Manual
All
History
Request

Time	ACID	Uplink / Downlink	Type	Message	Time to Respond	Downlink Response	Time to Execute	Command
18:57...	SWA288	↑	UM23	DESCEND TO AND MAINTAIN 330	---	WILCO	---	A330
18:58...	SWA254	↓	UM23	DESCEND TO AND MAINTAIN 330	SENT	AUTO	EX'D	A330
18:58...	SWA254	↓	DMO	WILCO	---	---	---	---
18:59...	SWA322	↑	UM74	PROCEED DIRECT TO ILM	17	AUTO	---	PF ILM
18:59...	SWA322	↑	UM169	REST OF ROUTE UNCHANGED	---	---	---	---

**Example 1**

CPDLC Message view

CALLSIGN
Manual
All
History
Request

Time	ACID	Uplink / Downlink	Type	Message	Time to Respond	Downlink Response	Time to Execute	Command
19:27...	SWA288	↑		PROCEED DIRECT TO ILM REST OF ROUTE UNCHANGED	11	AUTO	---	PF ILM
19:27...	SWA322	↑		CONTACT WASHINGTON CENTER 121.875	SENT	AUTO	---	---
19:27...	SWA322	↓		WILCO	---	---	---	---
19:27...	SWA288	↑		CLIMB TO AND MAINTAIN 330	SENT	AUTO	13	A330

**Example 2**

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The CPDLC Message view provides the information listed below.  
All entries requiring a manual response are highlighted in blue.

TIME	The time the message was added to the view.
ACID	<p>Callsign.</p> <p>A symbol to the left of the callsign appears on the original message of any message set. Click on the symbol to toggle between displaying just the original message or all messages in the set. An example is SWA254.</p> <p>A right arrow indicates the message was a response. An example is SWA254.</p>
UPLINK/DOWNLINK	An up arrow indicates an uplink. A down arrow indicates a downlink.
TYPE	The “Global CPDLC Standards” message number for the type of downlink or uplink. Ghost Pilots typically do not display this field.



MESSAGE	The message text.
TIME to RESPOND	<p>For targets set to Automatic response mode, the field displays a countdown timer, in seconds, prior to message transmission. Once the message is sent, the text SENT will appear.</p> <p>Ghost Pilots can change the time to respond for targets set to Automatic response mode (to be covered in a later lesson).</p> <p>The purpose is to simulate the amount of time it would take for the flight crew to receive, read, and respond to the message.</p> <p>For targets in Manual response mode, the response is sent as soon as the Ghost Pilot enters the command to do so. No timer is necessary.</p>
DOWNLINK RESPONSE	<p>For targets set to Automatic response mode, the word AUTO is displayed.</p> <p>For targets set to Manual response mode, the field displays the response that will be sent when the Ghost Pilot manually releases the message. The default response is WILCO.</p> <p>Ghost Pilots can change the response in either mode (to be covered in a later lesson).</p>
TIME TO EXECUTE	<p>For targets set to Automatic response mode, the field displays a countdown timer, in seconds, prior to command execution. Once the command is executed, the text EXE'D will appear.</p> <p>Ghost Pilots can change the time to execute for targets set to Automatic response mode (to be covered in a later lesson).</p> <p>The purpose is to simulate the amount of time it would take the pilot to execute the clearance.</p> <p>For targets in Manual response mode, the command is executed by the Ghost Pilot. No timer is necessary.</p>
COMMAND	The ATCoach command that will be executed. This is automatically derived by ATPilot but can be edited by the Ghost Pilot (to be covered in a later lesson).

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## Knowledge Check

**Which icon is used to open the CPDLC Message View?**



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Slide - 54.

## Knowledge Check

Which entry requires a manual response?

CPDLC Message view

CALLSIGN: [dropdown] Manual All History Request

Time	ACID	Uplink / Downlink	Type	Message	Time to Respond	Downlink Response	Time to Execute	Command
18:57...	SWA288	↑	UM23	DESCEND TO AND MAINTAIN 330	---	WILCO	---	A330
18:58...	SWA254	↑	UM23	DESCEND TO AND MAINTAIN 310	SENT	AUTO	EXED	A310
18:58...		↓	DMO	WILCO	---	---	---	---
18:59...	SWA322	↑	UM74 UM169	PROCEED DIRECT TO ILM REST OF ROUTE UNCHANGED	17	AUTO	---	PF ILM

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## Knowledge Check

**On the CPDLC Message View, what information does the Command field provide?**

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## Part Task Scenario 2

- **Part Task scenario to practice interpreting information presented in the Ghost Pilot display.**
- **Completed in the Test and Training Lab (TTL) without headsets.**
- **The instructor checklist includes all tasks covered in this lesson.**
- **Approximately 30 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 2:

---

<b>Purpose</b>	To practice interpreting information presented at the Ghost Pilot display.
<b>Materials</b>	The instructor will use the Part Task Scenario 2 checklist. No student handouts are required.
<b>Directions</b>	<p>A locally developed scenario should be loaded and ready to start in the TTL. Requirements for the scenario have been provided to the facility.</p> <p>No controllers are needed.</p> <p>No headsets are needed.</p> <p>Instructors should use the checklist to step through all the functionality to be practiced. Instructors should assist students as necessary.</p> <p>Approximate duration of the exercise is 30 minutes.</p>

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## Summary

- **Data Blocks**
- **Selected Aircraft Information Area (SAIA)**
- **Active Aircraft List (AAL)**
- **Future Aircraft List (FAL)**
- **Message Area/Role Play view**
- **CPDLC Message view**

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