Federal Aviation
Administration

Initial En Route Qualification Training

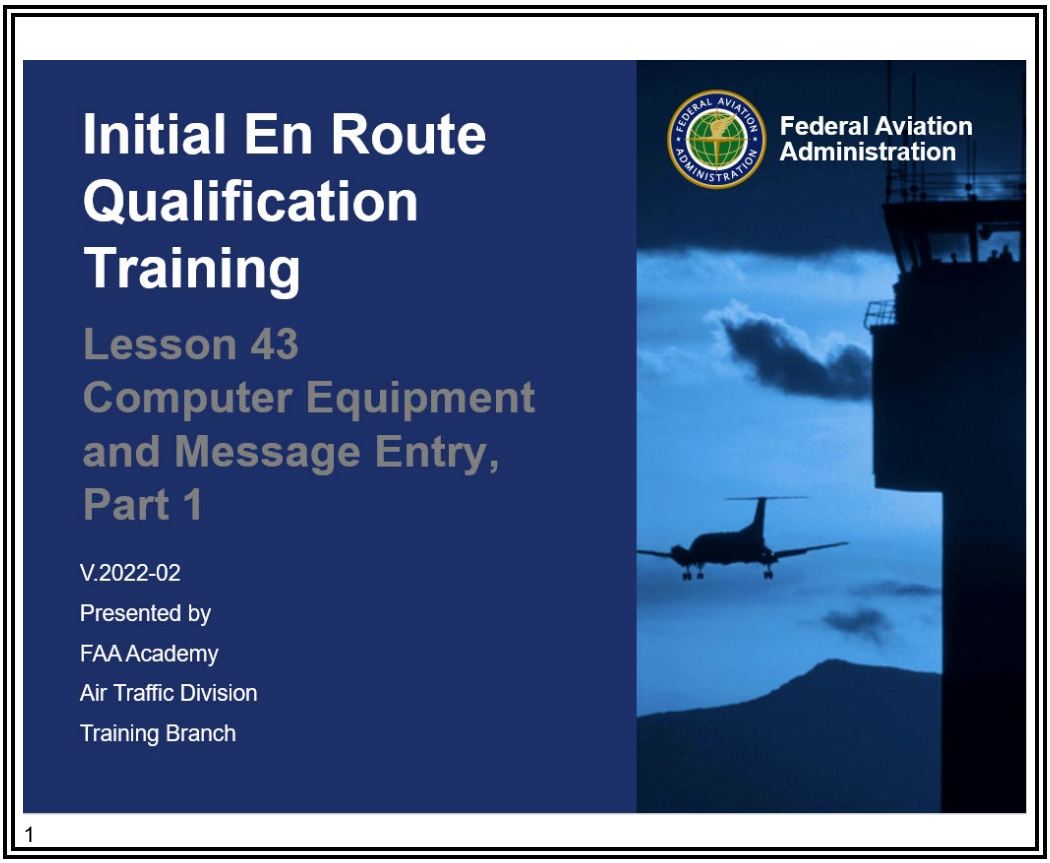
Lesson 43
Computer Equipment And Message Entry, Part 1

Course 50148001

LESSON PLAN DATA SHEET

COURSE NAME:	INITIAL EN ROUTE QUALIFICATION TRAINING
COURSE NUMBER:	50148001
LESSON TITLE:	COMPUTER EQUIPMENT AND MESSAGE ENTRY, Part 1
DURATION:	24+00 HOURS
DATE REVISED:	2022-02
VERSION:	V.2022-02
REFERENCE(S):	FAA ORDER JO 7110.65, AIR TRAFFIC CONTROL; TI6110.101, RADAR-ASSOCIATE POSITION USER MANUAL; TI6110.100, RADAR POSITION USER MANUAL
HANDOUT(S):	COMPUTER MESSAGE CHECKLISTS and LAB QUICK REFERENCE GUIDE
EXERCISE(S)/ ACTIVITY(S):	ERAM CBIs / MESSAGE PRACTICES 1 - 3 (PERFORMED IN THE CLASSROOM)
END-OF-LESSON TEST:	NONE
PERFORMANCE TEST:	NONE
MATERIALS:	NONE
OTHER PERTINENT INFORMATION:	NONE

INTRODUCTION



In the course so far, you have learned to coordinate and separate using non-automated procedures. In this lesson, you will apply the same concepts via automated procedures.

INTRODUCTION *(Continued)*

Opening Scenario

COMPUTER MESSAGE ENTRY AND EQUIPMENT

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Using the equipment is a critical aspect of your position as a Radar-Associate controller. Understanding the procedures associated with the equipment allows for safe and expeditious sector operations.

NOTE: The term “message” is being replaced with the term “command” when entering data into the ERAM computer. While you may hear the term “message” in your training at the Academy, the term “command” will be used at ERAM facilities during Stages 2, 3, and 4. For example, computer “message” entry will become computer “command” entry.

Purpose

In this lesson, you will learn about the equipment controllers use as well as the preferred methods for computer messaging.

INTRODUCTION *(Continued)*

Lesson Objectives

LESSON OBJECTIVES

In accordance with FAA Order JO 7110.65, TI6110.101, and TI6110.100, you will be familiar with:

- Purpose of ERAM and its basic operations
- Benefits of EDST
- Hardware used in the Radar-Associate position
- Computer messages
- EDST entries

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EN ROUTE AUTOMATION AND MODERNIZATION (ERAM)

Purpose of ERAM
TI6110.101, par. 2.2.2

EN ROUTE AUTOMATION AND MODERNIZATION (ERAM)

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⊙ The ERAM system provides air traffic controllers with advanced tools to manage information and to facilitate interacting with that information.

System Overview
TI6110.101, par. 1.3.1

⊙ The system combines real-time flight plan data, radar track data, site adaptation, aircraft performance characteristics, winds and temperatures aloft to construct four-dimensional flight profiles (trajectories), for active and proposed flights.

NOTE: The four-dimensions are longitude, latitude, altitude, and time.

- For active flights the system adapts to observed behavior of aircraft
  - Adjusts speeds, climb/descent rates
    - → This allows the system to maintain aircraft trajectories to get the best possible prediction of future aircraft positions

EN ROUTE AUTOMATION AND MODERNIZATION (ERAM) *(Continued)*

Area of Interest (AOI)
TI6110.100, par. 2.1

⊙ ERAM introduces the "flight planning" area of interest (AOI) that is an adapted area outside of the Center Boundary within which flight plan data is available from other ERAM facilities.

- The center boundary is also referred to as the Area of Responsibility

Basic Operations
TI6110.101, pars. 1.3.2, 1.3.4, 1.3.5

⊙ There are two types of basic operations:

- Plan Processing includes:
  - Current Plans is the trajectory of an aircraft's active flight plan
    - → The system **must** have a flight plan in order to model a trajectory

NOTE: Track data is **not** mandatory to model a trajectory, but it will make it more accurate.

  - Trial Plans is the trajectory for a proposed amendment created at the RA position

NOTE: The system uses these trajectories to continuously detect potential conflicts with other predicted trajectories/Special Activity Airspace (SAAs):

  - Up to 20 minutes into the future
  - To provide notification to the appropriate sector

- Tracking Processing includes:
  - Conformance Monitoring is where track report data, such as Computer Identification Number (CID), beacon code, time, position, and altitude, is submitted from the system every 12 seconds
    - → Conformance Monitoring checks track data against the Current Plan trajectory
    - → If the data is out of conformance, it will re-conform

EN ROUTE AUTOMATION AND MODERNIZATION (ERAM) *(Continued)*

Primary Function of ERAM Decision Support Tools (EDST)
TI6110.101, pars. 1.2.1, 1.2.2, 1.2.4

- Prior to ERAM, paper strips and the User Request Evaluation Tool (URET) were the initial Radar-Associate tools used to detect conflictions.
  - URET functionality has been incorporated into ERAM
- Conflict Probe is the automatic detection and notification of predicted aircraft-to-aircraft and aircraft-to-airspace conflicts
  - Allows for timely resolution
  - Improves traffic flow
- Trial Planning allows the system to check a desired amendment before issuing the clearance to see if the planned amendment will resolve the conflict and/or cause any other conflicts.
  - Can be converted to a flight plan amendment with a mouse click
- Flight Data Management is the primary source of flight data for proposed and active aircraft of interest to the sector.

EDST BENEFITS

Benefits to Controllers

BENEFITS

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⊙ EDST is a decision support tool.

- EDST does **not** change controller responsibility for separation of aircraft
- EDST is a tool to help the controller make decisions
  - The controller **still** decides when and how to use this information
    - → As a controller, you will use the same skills and apply the same good judgment that you have been taught so far in your training

⊙ EDST is more timely and accurate than a strip operation.

- EDST **always** displays the most up-to-date flight data

NOTE: When a new strip comes off the printer with updated flight plan information, that strip may **not** make it to the active bay in a timely manner. Consequently, controllers may be using old, inaccurate flight plan data to make decisions. This does **not** happen with EDST.

- EDST uses radar track data as well as flight plan data to predict conflicts

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EDST BENEFITS *(Continued)*

Benefits to Controllers (Cont'd)

NOTE: Times on strips can be up to 3 minutes off **without** the controller receiving an update. Because of this, aircraft with the same estimates over a common fix can miss by dozens of miles. RA controllers may spend quite a bit of time addressing traffic situations that do **not** really exist. Because EDST uses radar track data, it is far more accurate than strips in predicting conflicts.

⊙ EDST enhances efficiency of the sector team by providing:

- Relief from routine tasks, such as stripmarking and strip manipulation
  - A MITRE Corporation study for the FAA found that 60% of the RA controller's time is spent marking, moving, and manipulating strips
- Automated prediction of potential conflicts
  - Conflicts are prominently displayed on the EDST screen
  - EDST **always** uses the most up-to-date information (flight plan data and radar track data) to provide conflict notification
  - This allows more time for the RA controller to assist the Radar controller in:
    - → Managing sector workload
    - → Responding to user requests
    - → Strategic planning
- More efficient use of time
  - Controllers keep their eyes on the radar glass, **not** on the strips
  - Helps controllers recognize traffic situations as they develop
  - Helps to perform required coordination
  - Looks for conflicts
  - Uses trial planning
  - RA and Radar controllers communicate more with each other

NOTE: Particularly when busy, a controller's most valuable commodity is extra time—time to evaluate situations and make good decisions. EDST helps to provide that extra time.

EDST BENEFITS *(Continued)*

Benefits to Airspace Users

- Automated conflict prediction provides a more accurate assessment of user requests.
- Enhanced amendment capabilities provide greater access to direct routings.
- Flight time and fuel consumption are reduced due to aircraft flying more direct routes.
- Restrictions in route, altitude, and speed are reduced.

RADAR-ASSOCIATE POSITION HARDWARE

Flat Panel Display
TI6110.101, par. 3.3.1

FLAT PANEL DISPLAY

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- Flat panel display is the main interface with system.
  - It can be adjusted for viewing at RA-Position or R-Position

Toolbar
TI6110.101, par. 3.3.1

TOOLBAR

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- The Toolbar is located either at the top or bottom of the flat panel monitor and is **always** displayed.
  - **No** other displays can overlap the Toolbar
  - It contains buttons for accessing each of the major display windows, as well as information about the system status

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Toolbar (Cont'd)
TI6110.101, par. 3.3.1

- The window buttons on the Toolbar serve as a toggle to either minimize or maximize all ERAM windows
- To display any ERAM window that is **not** currently displayed, left-click on its button on the Toolbar

⊙ The Toolbar includes the following buttons:

Button	Displays…
MORE	Displays second row of access buttons
ACL	Aircraft List
DEP	Departure List (DL)
GPD	Graphic Plan Display
PLANS	Plans Display
WX REPORT	Weather Station Report View
SIG	SIGMETS View
NOT	NOTAMS View
GI	General Information Messages View
UA	Update Area View
STATUS ACTIVE	Status View
OUTAGE 66	Outage View
NON - ADSB	Turns on/off the ADSB indicator of ADSB equipped aircraft
WIND	Wind Grid Display
ALTIM SET	Altimeter Settings View
MCA	Message Composition Area View
RA	Response Area View
FEL	Flight Event List
KEEP ALL	Keeps all aircraft in the ACL from dropping off display. VCI indicator box turns gray.

NOTE: Later in this lesson you will take a series of computer-based instructions (CBIs) which will provide more detail on the displays listed in the table.

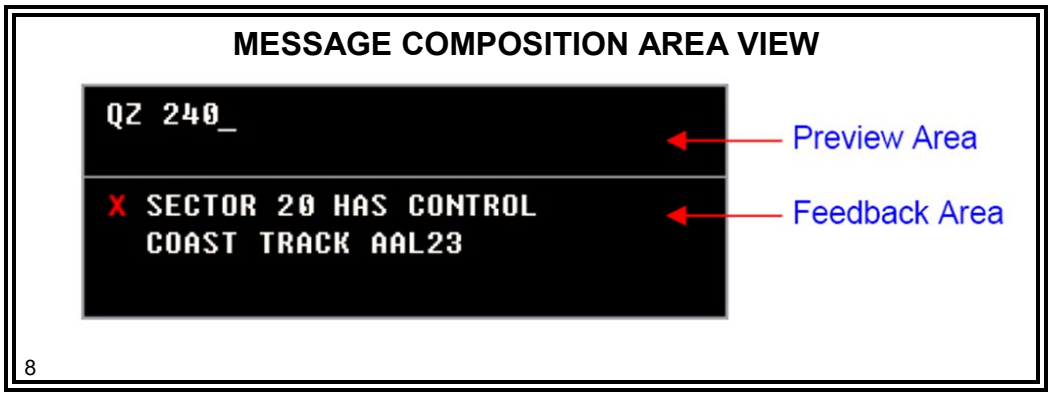
RADAR-ASSOCIATE POSITION HARDWARE *(Continued)*

Lists
TI6110.101,
par. 3.3.1

- Aircraft List (ACL) is the same as the “active” bay.
  - It is the primary display the Radar-Associate controller interfaces with when operating the EDST system
  - It displays flight data and alerts for active flights.
  - The ACL does **not** display any times
- Departure List (DL) is the same as the “suspense” bay.
  - It uses the same format as the ACL to show proposed departures
  - It displays P time before the flight identification
  - It displays the code before the route of flight
  - You **must** look at the route of flight to determine the departure point
  - The DL does **not** display speed of aircraft

RADAR-ASSOCIATE POSITION HARDWARE *(Continued)*

Message Composition Area (MCA) View
TI6110.101, pars. 3.6.1, 3.6.3, 3.6.7



- The Message Composition Area View (MCA) consists of the:
  - Preview Area which is used to type commands
  - Feedback Area which displays command feedback in the form of Accept, Error, and Reject messages
- MCA View
  - If the cursor is **not** in an input area of an ERAM display and the user starts typing, the MCA View will pop to the top of the display and the characters typed will be echoed in the Preview Area
- Clearing the Preview of MCA
  - Press the CLEAR key to erase all text in the Preview Area

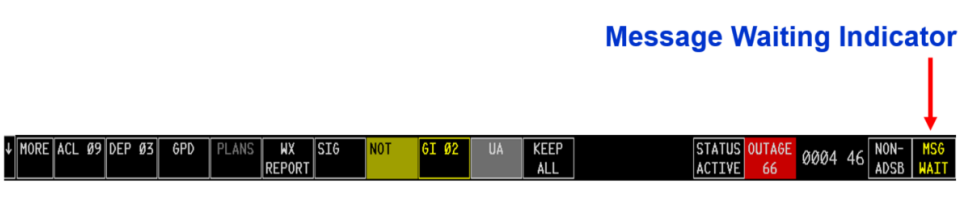
Response Area (RA) View
TI6110.101, pars. 3.9.1, 3.9.2, 3.9.6

- The Response Area View provides an area to display requested information.
- Left/middle-click the RA button on the Toolbar to access the Response Area.
- There are two ways to clear the Response Area:
  - Middle-click anywhere on the RA View to display the View menu
  - Left/middle-click CLEAR to remove the message text

RADAR-ASSOCIATE POSITION HARDWARE *(Continued)*

Message Waiting Indicator
TI6110.101, par. 3.3.4

MESSAGE WAITING INDICATOR



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- The last box on the right side of the Toolbar is the Message Waiting Indicator.
  - If there is a message waiting in the Update Area View, MSG WAIT appears in yellow in the box; otherwise, it displays in gray.

Update Area (UA) View
TI6110.101, par. 3.7.3

UPDATE AREA (UA) VIEW

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- The Update Area (UA) View displays update messages.

RADAR-ASSOCIATE POSITION HARDWARE *(Continued)*

Acknowledging Queued Messages
TI6110.101, par. 3.7.4

- There are three ways to view messages:
  - Left/middle-click on the ‘MSG WAIT’ button on the Toolbar
  - Press the MSG ACK key
  - Left/middle-click ‘MESSAGE WAITING’ in the Update Area View
- Acknowledging the queued message raises the Update Area View to the top of the screen and shows the queued message.
  - Any previously displayed message in the UA View is cleared

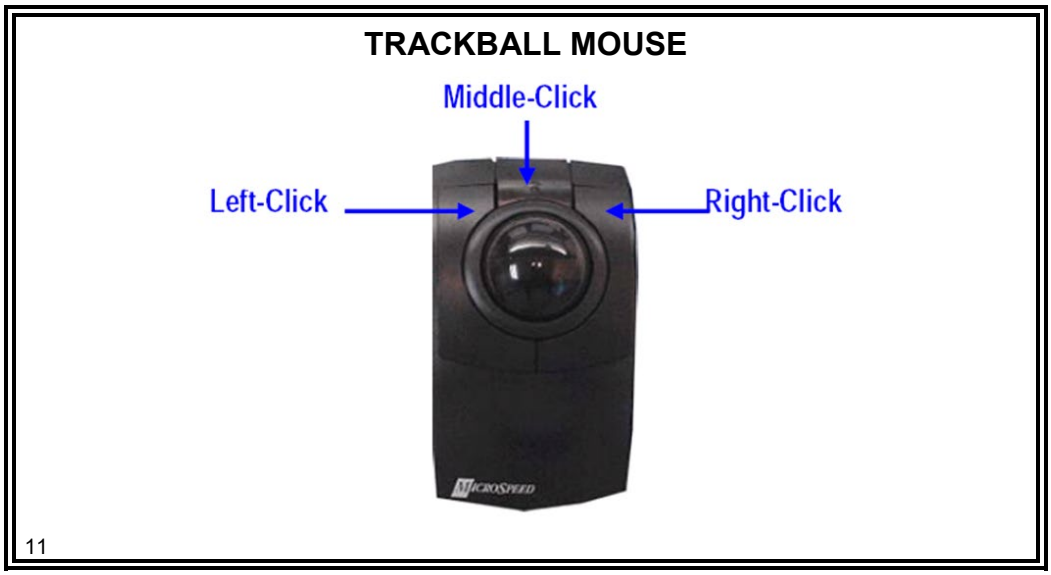
Clearing the Update Area
TI6110.101, par. 3.7.5

- There are three ways to clear the Update Area:
  - Left/middle-click on the empty MSG WAIT button on the Toolbar
  - Press the MSG ACK key
  - Left/middle-click to empty ‘MESSAGE WAITING’ area in the Update Area View

System Status Information
TI6110.101, par. 3.3.3

- The numbers on the ACL and DEP buttons indicate the number of aircraft entries in the Aircraft List and Departure List.
- The SIG, NOT, and GI buttons have a yellow border and yellow text when there are unacknowledged entries in their view.

Trackball Mouse
TI6110.101, par. 2.3.3



⊙ Using the trackball mouse requires proper placement of the cursor before completing a function.

Trackball Button	Button Name	Function
Left	Select Button	When pressed (or clicked) it either: 1. Selects an object 2. Executes an immediate action
Middle	Implied Command Button	When pressed, it activates an implied command.
Right	Implied Delete Button	When pressed, removes information from the display.

NOTE: When using the trackball, controllers often use the memory aid SAD—select, activate, and delete.

KEYBOARD

Keyboard

D- Side KEYBOARD

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- The keyboard provided at each RA position:
  - Is used to enter data and to request information from ERAM
  - Consists of:
    - Alphabetic and Special Symbol Keys and Numeric Keypad
    - Hard-Labeled Function Keys
    - Text-Editing Keys
    - Immediate Action Hard-Labeled Function Keys

KEYBOARD *(Continued)*

Alphabetic and Special Symbol Keys and Numeric Keypad

ALPHABETIC AND SPECIAL SYMBOL KEYS AND NUMERIC KEYPAD

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- Default mode is Overstrike.
- All alphabetic, numeric, and special symbol keys will auto-repeat if held down.

NOTE: The numeric keypad is reversed from conventional keyboard.

KEYBOARD *(Continued)*

Hard-Labeled Function Keys

HARD-LABELED FUNCTION KEYS

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- 30 keys
  - 24 on the top two rows and 6 above the QWERTY array
- Used as message designators

KEYBOARD *(Continued)*

Text-Editing Keys

TEXT-EDITING KEYS

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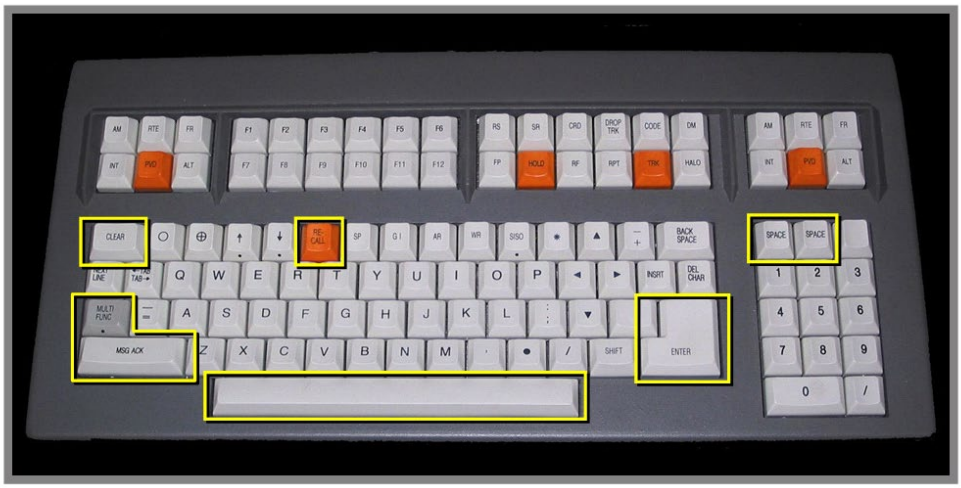
- Insert (INSRT) key
  - Used to place the editor in Insert mode
- Delete Character (DEL CHAR) key
  - Used to delete the character at the location of the keyboard cursor
- TAB key
  - Used to tab right or, with a Shift action, to tab left
    - Holding the TAB key down results in continuous tabbing
- NEXT LINE key
  - Used to move the keyboard cursor to the first character position of the next line of the Preview Area
- BACKSPACE key
  - Used to move the keyboard cursor one character position to the left, deleting the character in the position
- Keyboard cursor arrow keys
  - Used to move the keyboard cursor within the Preview Area
    - Holding any of the keyboard cursor arrow keys down results in continuous movement of the keyboard cursor

KEYBOARD *(Continued)*

Immediate Action Hard-Labeled Function Keys

IMMEDIATE ACTION HARD-LABELED FUNCTION KEYS



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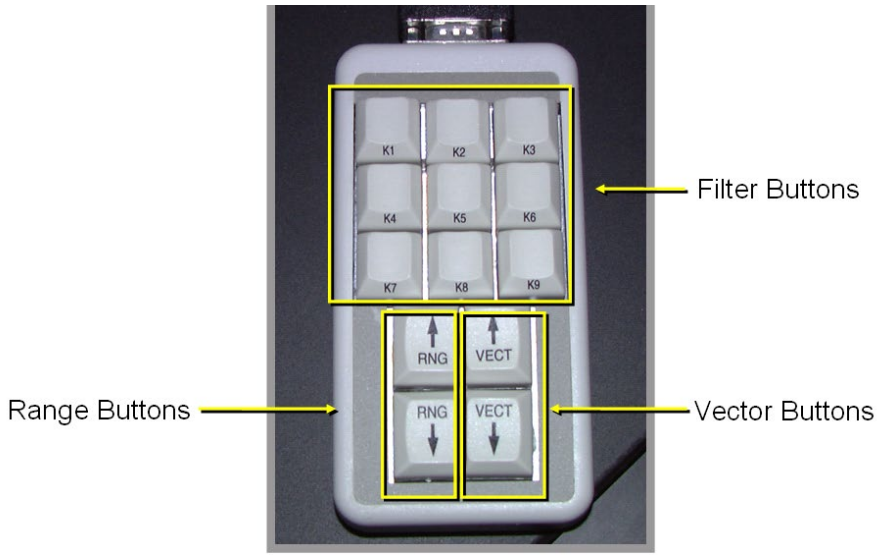
- RECALL key
  - Used to retrieve a previously entered message
- Message Acknowledge (MSG ACK) key
  - Used to acknowledge the next message in the update queue at the D-position
- Space bar and Space key
  - Used to enter a single space
- ENTER key
  - Used to enter an input message displayed in the MCA
- Multifunction (MULTI FUNC) key
  - Darker gray than other keys
  - **Always** used in conjunction with other keyboard entries
- CLEAR key
  - Used to remove from the display all the information in the Response Area

KEYBOARD *(Continued)*

Keypad Selection Device

KEYPAD SELECTION DEVICE (KSD)



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- The Keypad Selection Device (KSD) operates independently from the trackball and includes:
  - Filter buttons
    - Enable immediate action commands that toggle a subset of filters on or off
      - → Filter buttons are site-specific.
  - Vector (VECT) and Range (RNG) buttons
    - Change the vector and range settings

KEYBOARD *(Continued)*

Knowledge Check

KNOWLEDGE CHECK

QUESTION: To move the cursor to the next lower line of text, press the _____ key.

A. Tab

B. Next Line

C. Backspace

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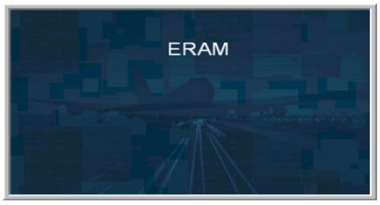
EQUIPMENT COMPUTER-BASED INSTRUCTION (CBI)

Equipment CBIs

CBIs FOR LESSON PLAN PAGES 1-23



- Working with Windows
- Areas and Columns
- Interacting with Entries
- Entry Coding
- NOTAMs, GIs, and SIGMETs
- Status and Outage Views
- Wind Grid

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Working with Windows CBI

⊙ In the Working With Windows CBI, you will:

- Operate EDST windows
- Learn the functions of the RA trackball
- Learn how to use the Message Composition Area (MCA), Response Area (RA), and Update Area (UA)
- Perform basic EDST functions

Areas and Columns CBI

⊙ In the Areas and Columns CBI, you will:

- Identify the different posting areas on the ACL and DL and their functions
- Change the flight plan sort order
- Identify columns in the ACL and DL

EQUIPMENT COMPUTER-BASED INSTRUCTION (CBI)
(Continued)

Interacting with Entries CBI

⊙ In the Interacting with Entries CBI, you will:

- Learn Keep List entries
- Use the Add/Find Box
- Use the Bookkeeping Box
- Highlight entries
- Enter and suppress free-form text
- Move flight plans to and within the Special Postings Area

Entry Coding CBI

⊙ In the Entry Coding CBI, you will:

- Interpret color coding for:
  - IAFDOF
  - Unsuccessful Transmission Message (UTM)
  - Embedded Route Text (ERT)
  - Flights IDs
    - → Aircraft Identification (call sign)
    - → Discrete beacon code
    - → Computer Identification Number (CID)

NOTAMs, GIs, and SIGMETs CBI

⊙ In the NOTAMs, GIs, and SIGMETs CBI, you will:

- Access views
- Learn the entry coding
- Suppress/restore entries
- Sort and filter NOTAMs
- Forward and delete GI messages

Status and Outage Views CBI

⊙ In Status and Outage Views CBI, you will learn about:

- RA position Status button and views
- RA position Outage button and views

EQUIPMENT COMPUTER-BASED INSTRUCTION (CBI)
(Continued)

Wind Grid CBI

⊙ In Wind Grid CBI, you will:

- Learn the purpose of the Wind Grid Display
- Switch between temperature and wind data
- Recenter the display
- Change the display range and altitude

Directions

⊙ Complete the following EDST equipment CBIs in the order shown:

1. Working with Windows
2. Areas and Columns
3. Interacting with Entries
4. Entry Coding
5. NOTAMs, GIs, and SIGMETs
6. Status and Outage Views
7. Wind Grid

Time

⊙ 60 minutes

Guidelines

⊙ Take your time. There is a lot of information to digest.

- Make sure to read the text as well as listen to the narration
- You are **only** required to do something if you hear “try it”
- The CBI lessons do **not** show a fully functional system

⊙ Even though there are sometimes several ways to accomplish a task within the EDST, the CBIs generally show and teach the “best” way to do so.

NOTE: Sometimes the CBI may **not** allow you to perform a function with an alternate method. You may get an “incorrect” response. This is because the CBI is showing you the quickest and best way of using EDST.

EQUIPMENT COMPUTER-BASED INSTRUCTION (CBI)
(Continued)

Message Practice 1

NOTE: For students checklists are in the handout section of their binders labeled “Computer Message Checklists MP 1 – 4 HO”. Checklists for instructors are in binders in each classroom and should be handed out for the scenario and then picked up by the lead instructor.

HARD-LABELED FUNCTION KEY ENTRIES

Terms

NOTE: While most computer entries can be made using the EDST, there are still those that may **only** be made using the hard-labeled function keys. Some messages may be made using both EDST and the function keys, but our goal is to teach you the most efficient way to make an entry.

- A **computer message** consists of a series of fields in a specified order. It enables two-way communication to take place between the specialist and the computer.

- A **field** is one or more continuous nonspace characters separated from each adjacent field by a space.

- **Elements** are items of information within a field, composed of characters that are separated by special characters (**never** a space).

- **Character** is a graphic symbol, such as the clear weather symbol (O), or a letter or number on the alphanumeric keyboard.

Element Separators

⊙ Common element separators include:

- "/" is used to separate elements in aircraft data and route

  Example: H/B763/I

- "." is used to separate unlike elements in the route

  Example: KMLU.V18.MHZ.V9.SQS.V535.HLI..M41

- ".." is used to separate like elements in the route

  Example: KMLU..MHZ..SQS..KGWO

- "./." is used to indicate that expired route elements have been omitted (tailored) or that future route elements not pertinent to the fix/sector have been omitted (truncated)

  Example: KATL./.MEI.V18.MLU..KMLU

NOTE: Element separators will also be used in EDST route entries.

HARD-LABELED FUNCTION KEY ENTRIES *(Continued)*

Flight Identification for Message Entries

⊙ There are four ways to identify a flight:

- Aircraft identification (call sign)
- Discrete beacon code
- Computer Identification Number (CID)
- Trackball entry

Initiating a Message

⊙ To begin a message using the hard-labeled function keys, select the key to begin the message (this is the first field in the message), followed by the correct format for that message.

- When the key is selected, 2 letters display in the MCA identifying the keyboard shortcut for that specific message

  Example: To change an aircraft's route, select the RTE hard-labeled function key. The letters QU appear in the MCA and the space is automatically inserted. You may now begin typing in the next field.

  – However, if you choose to use the keyboard shortcut for a particular message, you **must** insert a space before beginning the rest of the message

    Example: To change an aircraft's route, enter QU for the keyboard shortcut. You will also need to enter a space.

Flight Plan Message

⊙ This is the order that **must** be followed to enter a flight plan message using fields:

1. FP key - message type (Field 1).

2. Aircraft identification - call sign (Field 2).

NOTE: The aircraft call sign **must** begin with a letter and be between 2 and 7 characters in length.

Continued on next page

Flight Plan Message (Cont'd)

3. Aircraft data (Field 3) includes the:
    - Number of aircraft or Special Aircraft Indicator, followed by a slant (/);
    - Aircraft type, followed by a slant (/); and the
    - Equipment suffix.
4. Beacon Code (optional) (Field 4).

NOTE: If you omit the beacon code, the computer will assign one consistent with the equipment suffix unless a tentative flight plan (which consists of a call sign and beacon code) already exists. In that event, the computer will add the remainder of the flight plan information to the existing tentative flight plan.

5. Filed true airspeed in knots is 2 to 4 digits (Field 5).
6. Fix (Field 6) is the point where processing begins. The fix is 2 to 12 characters in length and includes:
    - Fix name (NAVAID or intersection, etc.)
    - Latitude/Longitude
    - FRD

Continued on next page

Flight Plan Message (Cont'd)

7. Coordination Time (at the fix) (Field 7) is **always** 5 characters, with the first character being one of the following letters:

    - E – estimated time (for active flights)
    - P – proposed departure time
    - D – actual departure time

    Example: P1300, E1455, D1232

NOTE: When the first 2 digits are XX, the minutes represent a relative time from the current time, for example, EXX02 is 2 minutes after the current time; EXX00 is the current time.

8. Assigned altitude for active flights (Field 8)

9. Requested altitude for inactive flights (Field 9)

NOTE: You will either have an entry for Field 8 or 9. The computer will know if it's an assigned altitude or a requested altitude based on the letter in front of the time.

10. Route of flight (Field 10)

    - First element **must always** be a fix
    - Last element **must always** be a fix
    - Element separators are used to separate elements in the route (either one dot or two)
    - Airways, STARs, SIDs are considered "routes", **not** fixes
    - An ETE /ETA may be attached to the last fix of the route using a slant (/) to separate the last fix and the 4 digit time

Continued on next page

HARD-LABELED FUNCTION KEY ENTRIES *(Continued)*

Flight Plan Message (Cont'd)

11. Pertinent remarks (optional) (Field 11)

- A clear weather symbol (O) is used for intercenter remarks
- An overcast symbol (circle with a plus in the middle) is used for intracenter remarks (⊕)
- If using both, the intracenter remarks precede the intercenter remarks

NOTE: Knowing field numbers is **only** relevant when using the amendment key (AM) to change flight plan data.

Eligibility

⊙ A message affecting flight plan data requires sector eligibility (track control).

⊙ Eligibility:

- Begins when a handoff (track control) is accepted on an aircraft
- Is terminated when an aircraft is handed off to another sector
- Eligibility override is /OK

NOTE: All messages using the keyboard require you to press ENTER at the end of the message.

MESSAGES REQUIRING A FUNCTION KEY

AM Key (AM)

AM KEY

FORMAT	**AM (FLID) 6 (fix) 7 (E with 4 digit time) 10 (route beginning with data in Field 6 or element separators connecting Field 6 with the remainder of Field 10)**
EXAMPLE	AM 123 6 SQS187023 7 EXX00 10 SQS187023..SQS.V278.IGB..KSTF

21

- Purpose is to amend any aircraft data (identifying the fields).
- The one AM you will use in the ZAE Radar Lab is referred to as a 6-7-10.
  - It is called this because it amends Field 6 (fix), Field 7 (time at the fix), and Field 10 (route)

NOTE: If a down arrow is used to indicate a new destination, it is inserted directly after the last letter of the new destination.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

RTE Key (QU)

RTE KEY

FORMAT	**To display a route:** **XX (number of minutes up to 99) FLID**
	To delete a route: **RTE (keyboard enter)**
	To modify a route: **RTE (fix) (fix) (down arrow if destination changes) FLID**
MESSAGE INPUT	**QU 30 631 (displays route line)** **QU LIT TUL 232 (modifies a route)**

22

- Purpose is to view a route segment and to modify a route using fixes **only**.

NOTE: Remember to use spaces to separate each field if modifying a route.

NOTE: Normally the flight id is the last element of a “QU” message.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

HALO Key (QP J)

HALO KEY (QP J)

FORMAT	HALO FLID
MESSAGE INPUT	QP J 631

23

- Purpose is to display Distance Reference Indicator or Halo around the selected target to assist in maintaining minimum separation.
  - Results in a 5 mile circle or “halo” around the specified target for a visual reference
- The format to remove a specific halo is the same as the format to display it.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

PVD Key (QP)

POINT OUT

POINT OUT SENT TO SECTOR 67:

FORMAT	PVD XX (sector number) FLID
EXAMPLE	**MESSAGE INPUT:** QP 67 UAL26

(Sector 67) BEFORE

UAL26
160

(Sector 67) AFTER

P
UAL26
160C
R 243 420

24

⊙ Purpose is to:

- Display a FDB on another sector which is used for point outs and traffic.

NOTE: If sector number is omitted, **not only** did you **not** send the data block to other sectors, your FDB is temporarily suppressed.

Continued on next page

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

PVD Key (QP)
(Cont'd)

REQUEST/SUPPRESS DATA BLOCK (QP)

FORMAT	PVD FLID
EXAMPLE	**MESSAGE INPUT:** QP AAL31 **BEFORE** P AAL31 230C R 163 420 **AFTER** AAL31 230

25

- Remove a FDB that was forced to your sector.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

DM Key (DM)

DEPARTURE MESSAGE

MESSAGE INPUT:

DM AAL134 0100 350

FOR…	FORMAT AS…	EXAMPLE
Current time	DM FLID	DM 156
Specific time	DM FLID (time)	DM 156 1205
Altitude	DM FLID (altitude)	DM 156 120

26

- Purpose is to activate/depart a proposed flight.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

TRK Key (QT)

START TRACK

FORMAT	TRK //XXX (fix) FLID
EXAMPLE	**MESSAGE INPUT:** QT //BOOSI N753B **BEFORE** **AFTER** I 3212 060 N753B V60 110 120

27

⊙ Purpose is to initiate a track for an aircraft at a specific fix.

NOTE: You will be required to start tracks on all aircraft cleared out of KVKS and 0M8 when the clearance is issued. Be as accurate as possible. System tracking accuracy **may** be compromised if more than 5 miles.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

DROP TRK Key (QX)

DROP TRACK

FORMAT	DROP TRK FLID
EXAMPLE	**MESSAGE INPUT:** QX 110 **BEFORE** N753B 170C 110 430 **AFTER** N753B 170

28

- Purpose is to discontinue tracking a particular flight while maintaining flight plan data.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

RS Key (RS)

REMOVE STRIP

FORMAT	RS FLID
EXAMPLE	**MESSAGE INPUT:** RS 110 **BEFORE** N523PC 170C 110 480 **AFTER** 3212 170

29

- Purpose is to remove all flight plan data and associated tracks from the system.
- Confirmation is required. Enter **"Y"** to confirm the data removal or press the CLEAR key to void the action.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

ALT Key (QZ)

ASSIGNED ALTITUDE

FORMAT	ALT XXX (altitude) FLID
EXAMPLE	**MESSAGE INPUT:** QZ 370 156 **BEFORE** AAL257 330C 156 460 **AFTER** AAL257 370↑330 156 460

30

- Purpose is to originate or change the assigned altitude for a specific aircraft.
  - Assigned altitude in FDB changes, updates are sent to appropriate facilities, and B4 character changes, if appropriate

NOTE: Leading zeros are required for the altitude.

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

INT Key (QQ)

INTERIM ALTITUDE

FORMAT	INT XXX (altitude) FLID
EXAMPLE	**MESSAGE INPUT:** QQ 140 N5270T **BEFORE** N5270T 120↓164 461 230 **AFTER** N5270T 140T164 461 230

31

⊙ Purpose is to keep FDB updated and current.

- Ensures FDB reflects actual status of aircraft; keeping current reduces false conflict alerts
- Assigned altitude in FDB is replaced by the interim altitude
- Updates are sent to appropriate facilities
- B4 character changes to a “T”

NOTE: This entry does **not** change the altitude in the flight plan database.

NOTE: Leading zeros are required for the altitude.

Continued on next page

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

INT Key (QQ) (Cont'd)

REMOVE INTERIM ALTITUDE

FORMAT	INT FLID
EXAMPLE	**MESSAGE INPUT:** QQ 461 **BEFORE** N59063 120T114 461 170 **AFTER** N59063 220↑114 461 170

32

⊙ Purpose is to remove the interim altitude.

- The interim altitude is replaced by the assigned altitude and the B4 character returns to normal

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

CODE Key (QB)

CODE KEY

FORMAT	CODE (xxx) FLID
EXAMPLE	QB 455 QB 1234 AAL455

33

- Purpose is to change, delete, or add an equipment qualifier.
  - Beacon code is **not** allowed as FLID
  - Updated message is sent to other sectors

MESSAGES REQUIRING A FUNCTION KEY *(Continued)*

SR Key (SR)

SR KEY

FORMAT	**SR FLID XXX (fix or strip number, or /T) 66 (sector where strip will print)**
EXAMPLE	**SR 231 VKS 66**

34

- Purpose is to request a printed strip.

CP Key (UU)

CONFLICT PROBE KEY

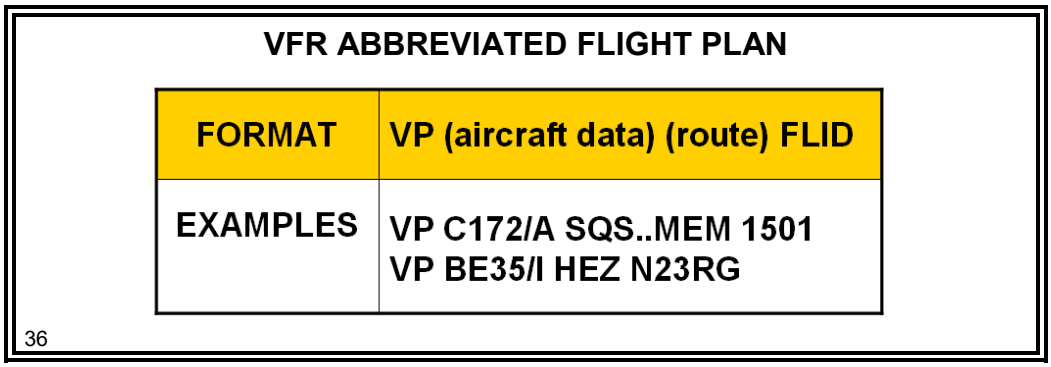
FORMAT	**UU**
EXAMPLE	**UU**

35

- Purpose is to move the ACL display forward on the EDST screen.
  - When the CP key is selected a “UU” message is started which brings the ACL to the front of the EDST. The CP key has other functions that if used by your facility will be trained at your facility.

MESSAGES REQUIRING NO FUNCTION KEY

VFR Abbreviated Flight Plan



- Purpose of the VP is to convert a tentative flight plan (call sign and code) to a full VFR flight plan.
- Results in the VFR flight plan creation starting at the aircraft's present location, using the current clock time, and "VFR" as the altitude.

NOTE: Do **not** use this message to create a flight plan for an IFR aircraft.

MESSAGES REQUIRING NO FUNCTION KEY *(Continued)*

Handoffs

HANDOFFS

Initiate a Handoff

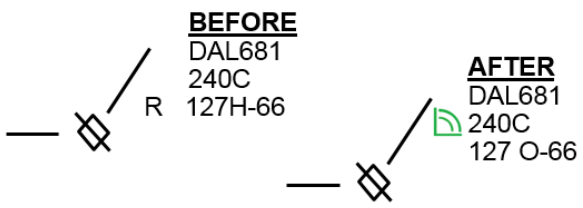
FORMAT	(sector name/number) FLID
EXAMPLES	67 213 H30 N1217S JJJ 2314

37

- Purpose is to initiate or accept a handoff.

HANDOFFS (CONT'D)

Accept Handoff

FORMAT	FLID
EXAMPLE	**MESSAGE INPUT:** DAL681or 127 

38

NOTE: If you accept a handoff, you assume track control. Track control is **not** the same as having control to move the aircraft.

NOTE: While accepting a handoff is an easy computer entry, it is usually done by the Radar Controller for frequency management.

Offset a Data Block

OFFSET A DATA BLOCK

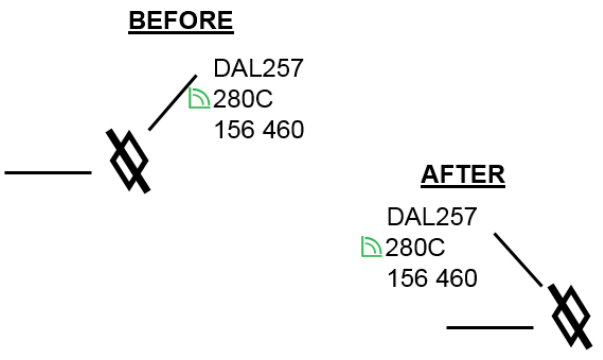
1 NW	2 N	3 NE
4 W	5	6 E
7 SW	8 S	9 SE

39

- Purpose is to change the position of the FDB relative to the position symbol.

OFFSET A DATA BLOCK (CONT'D)

FORMAT	X (digit from number keypad) FLID
EXAMPLE	**MESSAGE INPUT:** 1 156

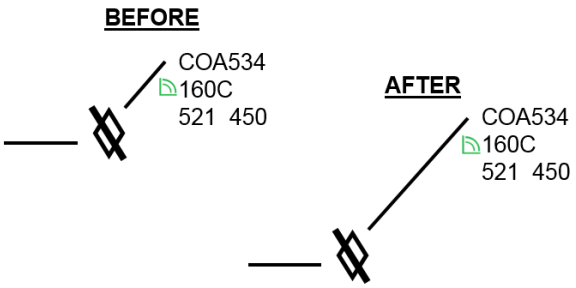


40

MESSAGES REQUIRING NO FUNCTION KEY *(Continued)*

Change a Leader Line

CHANGE A LEADER LINE

FORMAT	**/X (0-3 and 5) FLID (/0 removes the leader length and /5 causes the leader length to change to the setting at the R position)**
EXAMPLE	**MESSAGE INPUT:** /3 521 

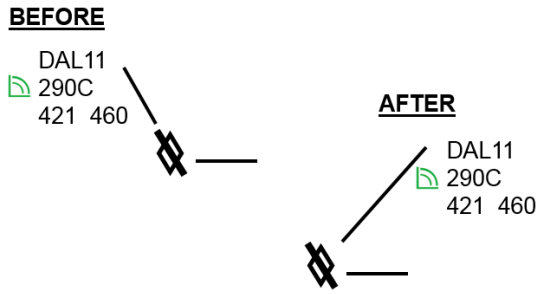
41

- Purpose is to change the length of the leader line.

MESSAGES REQUIRING NO FUNCTION KEY *(Continued)*

Offset Data Block/Change Leader Line

OFFSET DATA BLOCK AND CHANGE LEADER LINE

FORMAT	X (direction of data block) /X (leader line) FLID
EXAMPLE	**MESSAGE INPUT:** 3/3 421 

42

- Purpose is to offset a data block and change a leader line at the same time.

Knowledge Check

KNOWLEDGE CHECK

QUESTION: To reposition the FDB to the east, which number on the keypad would you select?

A. 3

B. 6

C. 7

43

Continued on next page

Knowledge Check (Cont'd)

KNOWLEDGE CHECK

QUESTION: Which entry will cause the leader length to reset to the R position setting?

A. 10

B. 1/

C. /5

44

MESSAGES REQUIRING NO FUNCTION KEY *(Continued)*

Forced Data Block

FORCED DATA BLOCK

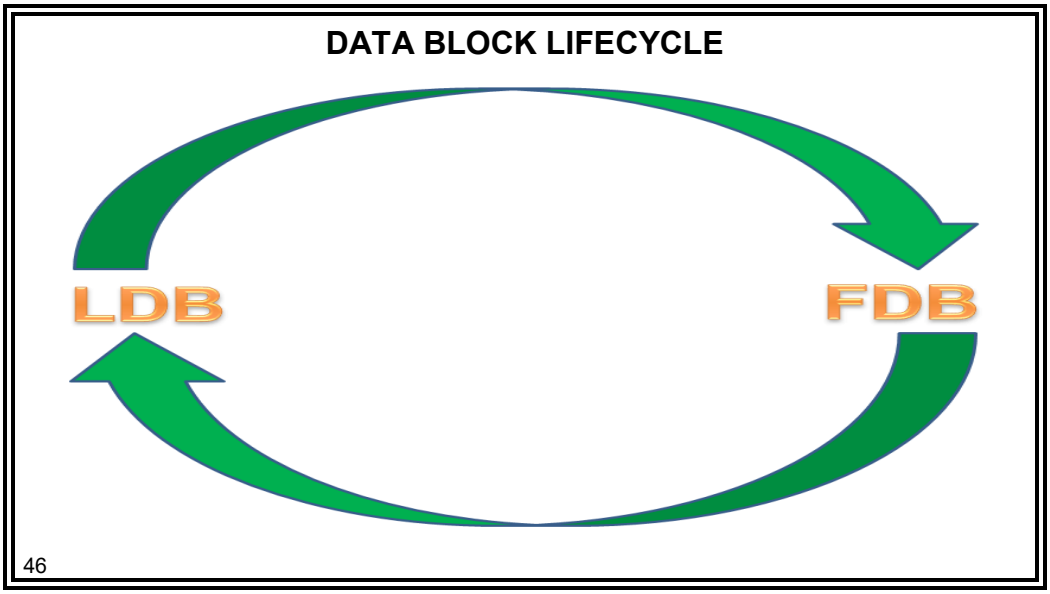
FORMAT to	• **Force a DB: FLID** • **Remove a DB: FLID**
EXAMPLE	**MESSAGE INPUT:** N234JP **BEFORE** N234JP 160 **AFTER** N234JP 160C R 354 210

45

⊙ Purpose is to force or delete the display of a specified data block for which you do **not** have track control.

MESSAGES REQUIRING NO FUNCTION KEY *(Continued)*

Data Block Lifecycle



NOTE: This is **only** for aircraft that are **not** your track control.

IF YOU HAVE…	AND YOU ENTER…	YOU GET…
Paired LDB	FLID	FDB
FDB	FLID	Paired LDB

MESSAGES REQUIRING NO FUNCTION KEY *(Continued)*

Fourth Line Data

FOURTH LINE DATA

MESSAGE TYPE	INPUT	RESULT	EXAMPLE(S)
QS	Heading FLID	Enters heading into fourth line of data block	H270
QS	/Speed FLID	Enters speed into fourth line of data block	S250
QS	Heading/Speed FLID	Enters heading and speed into fourth line of data block	H270 S250
QS	OFree-form text FLID	Enters the free-form text into fourth line of data block	H080/MGM
			PH
			DN
			D20L
			DR/AEX
QS	*/ FLID	Deletes heading from fourth line of data block	
QS	/* FLID	Deletes speed from fourth line of data block	
QS	* FLID	Deletes all stored fourth line data	

47

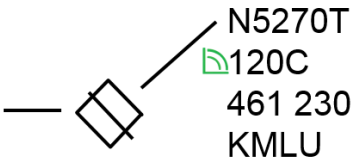
- Purpose is to enter and delete fourth line data block information.

FOURTH LINE DATA EXAMPLE

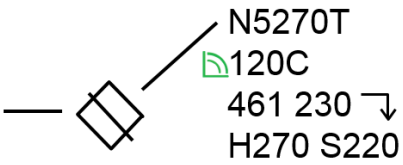
MESSAGE INPUT:

QS 270/220 461

BEFORE



AFTER



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MESSAGES REQUIRING NO FUNCTION KEY *(Continued)*

Message Practice 2

NOTE: For students checklists are in the handout section of their binders labeled “Computer Message Checklists MP 1 – 4 HO”. Checklists for instructors are in binders in each classroom and should be handed out for the scenario and then picked up by the lead instructor.

EDST ENTRIES

Menu Bar Buttons
TI6110.101, par. 4.3

NOTE: This lesson introduces you to EDST messages. The format of EDST messages is taught in the CBIs.

MENU BAR BUTTONS

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⊙ The menu bar buttons shown below enable you to access various command options when managing flight data.

Buttons	Description
Plan Options	Displays the Plan Options Menu, which is used to amend a flight plan, enter interim altitude, access previous route data, or specify an action to be taken on the selected Aircraft List entry.
Hold	Displays the Hold Data Menu, which is used for entering hold information such as location, direction, turn direction, leg length and EFC time for the specified entry.
Show	Used to graphically display or remove a selected aircraft's current plan and any alerts assigned to the sector on the Graphic Plan Display.
Show All	Used to graphically display or remove a selected aircraft's current plan and show all alerts assigned to that aircraft on the Graphic Plan Display.

Continued on next page

EDST ENTRIES *(Continued)*

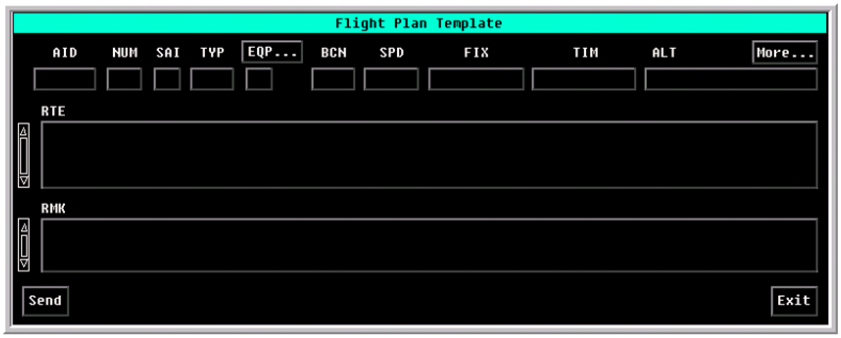
Menu Bar Buttons (Cont'd)
TI6110.101, par. 4.3

Buttons	Description
Sort Menu	Displays the Sort Menu for the Normal Posting Area. When a sort criterion is selected, the title bar of the Aircraft List is changed accordingly to show the new “sort by” selection.
Tools Menu	Displays the Tools menu, which is used to select restrictions, check the airspace status and display coordination column.
Posting Mode	Toggles between the automatic and manual posting modes for the Aircraft List. When a posting mode is selected, the title bar changes accordingly.
Template	Opens either the Flight Plan Template to create a flight plan (if **no** entry is selected) or the Amendment Template to amend a flight plan (if an entry is currently selected).
Clean Up	Cleans up the ACL by removing all entries coded gray for deletion.

EDST ENTRIES *(Continued)*

Templates
TI6110.101,
pars. 4.4.9, 4.4.10

FLIGHT PLAN TEMPLATE



50

⊙ When the user selects the Template menu bar button and **no** aircraft is selected, the Flight Plan (FP) template displays.

- The user fills in the required fields and left-clicks on the SEND button to submit the flight plan

NOTE: FP template on EDST will accomplish the same thing as an FP message using the FP key.

- Aircraft data is broken into 4 separate boxes
  - NUM – number of aircraft in the flight
  - SAI – special aircraft indicator ex. H for a heavy aircraft
  - TYP – type aircraft
  - EQP – equipment suffix

NOTE: EDST FP template has these 3 elements in 4 different boxes; the FP key combines all the aircraft data using a slant (/) to separate the elements. **Example:** 4/F16/P.

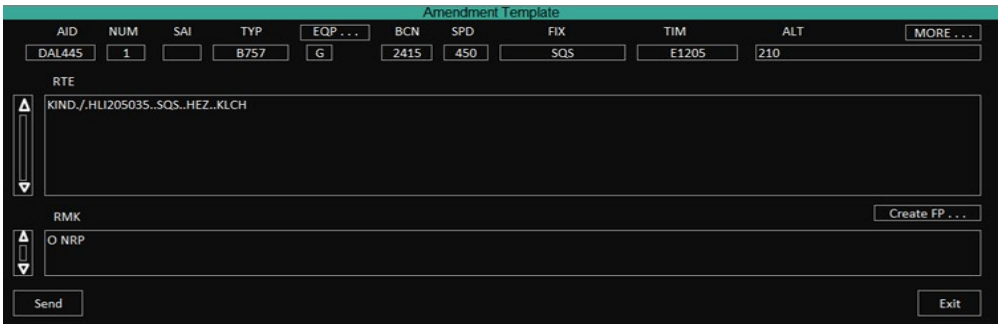
- BCN and RMK are still optional fields
- Remark symbols are still required: O and (overcast symbol O with a plus in the middle)
- Letters E, P, or D are still required before the time

Continued on next page

EDST ENTRIES *(Continued)*

Templates (Cont'd)
TI6110.101, pars. 4.4.9, 4.4.10

AMENDMENT TEMPLATE



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- When a user selects an aircraft on the ACL, and then left-clicks on the Template menu bar button, the Amendment Template opens populated with the flight plan data.
  - The FIX field (Field 6) is populated with the aircraft's current location
  - The TIM (time)(Field 7) is populated with the aircraft's time at the current fix
  - The RTE field (Field 10) is populated beginning with the current fix and the remainder of the route
- When a user selects an aircraft on the DL, and then left-clicks on the Template menu bar button, the Amendment Template opens populated with the flight plan data.
  - The FIX field (Field 6) is populated with the aircraft's departure point
  - The TIM field (Field 7) is populated with the aircraft's proposed time
  - The RTE field (Field 10) is populated with the complete route

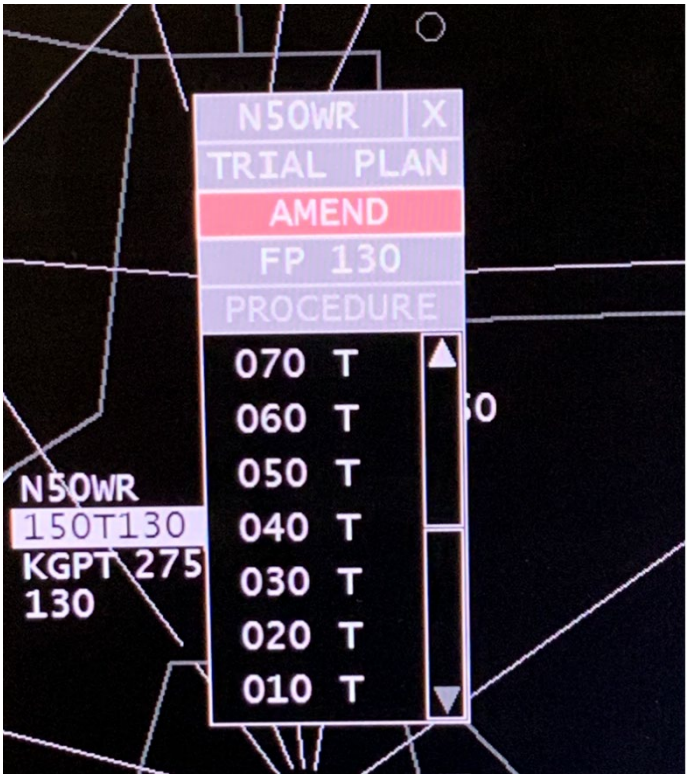
EDST ENTRIES *(Continued)*

Templates CBI

⊙ In the Templates CBI, you will learn more about Flight Plan and Amendment templates.

Altitude Amendments CBI
TI6110.101, pars. 4.6.12, 5.4

ALTITUDE AMENDMENT



52

⊙ In the Altitude Amendments CBI, you will:

- Create an ERAM altitude amendment
- Assign and delete an interim altitude
- Identify the purpose and components of the Altitude and Eligibility menus
- Identify functions and coding of the Plans Display

EDST ENTRIES *(Continued)*

Route Amendments
TI6110.101, par. 4.6.18

ROUTE AMENDMENTS - ERT

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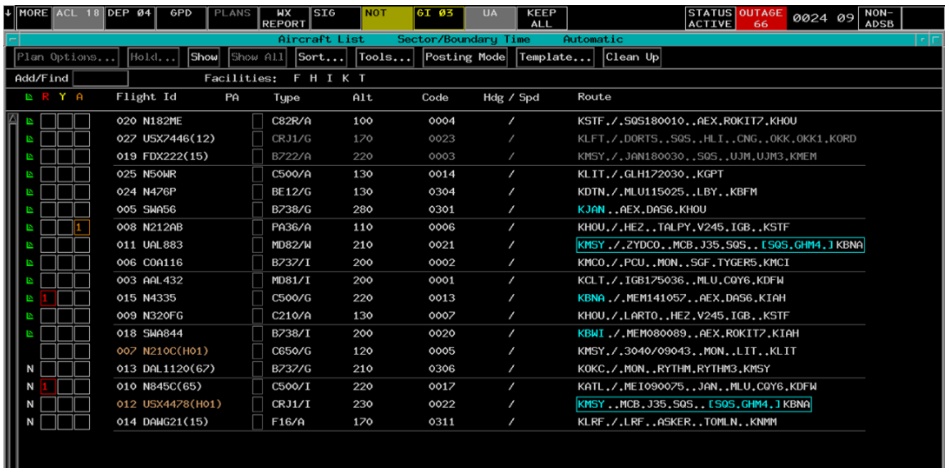
- ERT (Embedded Route Text)
  - ERT routing appears in the route string as blue text
    - This implies that the routing has been forwarded in ERAM, but has **not** been issued to the pilot (once the R-side has issued the ERT routing, right-click on it to delete the color coding)

Continued next page

EDST ENTRIES *(Continued)*

Route Amendments (Cont'd)
TI6110.101, par. 4.6.18

ROUTE AMENDMENTS - APR



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⊙ APR (ATC Preferred Route)

- A blue departure fix indicates than an ATC Preferred Route has been adapted for the flight's destination airport and the aircraft's current route does **not** include any of those adapted routes.
- Left-click on the route string to bring up the route menu
- Choose the appropriate routing

NOTE: This will be discussed in more detail in the CBI.

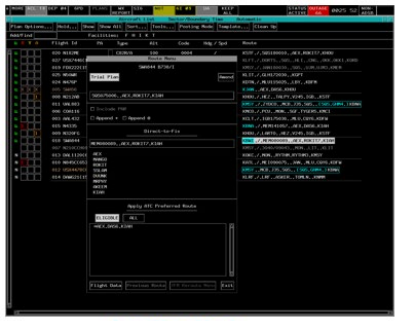
⊙ The difference between ATC Preferred Routes and ERT Routes is that ERAM automatically inserts ERT at a predefined point. This occurs even though the controller may **not** have issued the route to the aircraft. ERAM does **not** automatically insert ATC preferred routes.

Continued next page

EDST ENTRIES *(Continued)*

Route Amendments (Cont'd)
TI6110.101, par. 4.6.18

ROUTE AMENDMENTS - BEHAVIOR



Left-click

Right-click

Middle-click

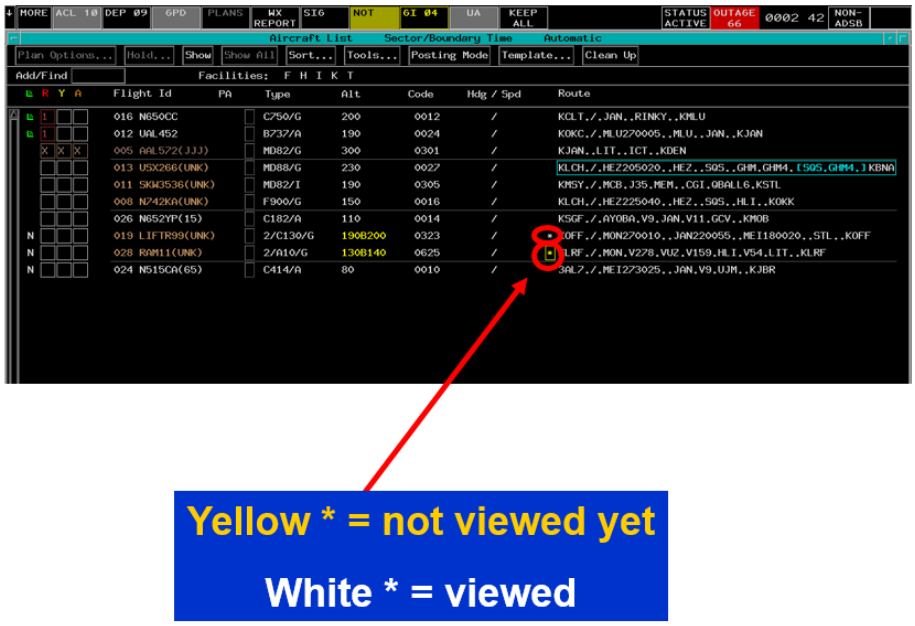
55

- Route field click behavior
  - Left-click to display the route menu
  - Middle-click to display/remove the Plans Display containing Flight Plan Readout
  - Right-click on the ERT to display the Send/Acknowledge Route menu

EDST ENTRIES *(Continued)*

Remarks Indicator
TI6110.101, par. 4.6.17; JO 7110.65, par. 13-1-5

REMARKS INDICATOR



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- The Remarks Indicator is the column immediately preceding the route.
  - A yellow asterisk (*) indicates that an entry has remarks that have **not** yet been viewed
    - Left-click on the asterisk to view the remarks
  - A white asterisk (*) indicates remarks have already been viewed
    - Remarks **must** be viewed by the sector team at least once

Route Amendment CBI

- In the Route Amendment CBI, you will:
  - Identify functions of the Route menu
  - Acknowledge Embedded Route Text (ERT) on ACL
  - Select an ATC Preferred Route (APR) from the Route Menu
  - Create amendments

Coordination and Hold Menus
TI6110.101, par. 4.6.16

COORDINATION

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⊙ To open the Coordination column:

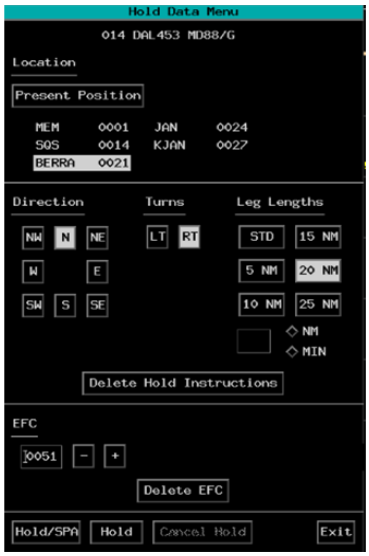
- From the Tools Menu, select Options and then click Display Coordination column

NOTE: Open the Coordination column at the beginning of each scenario in the Radar Lab.

Continued on next page

Coordination and Hold Menus (Cont'd)
TI6110.101, par. 4.6.16

HOLD DATA



58

- ⊙ The Hold Data column follows the Heading/Speed column.
  - The column displays an ‘H’ if any Hold Data exists for the aircraft
- ⊙ Hold Data includes:
  - Hold location (**must** be in the aircraft’s route)
  - Direction of hold
  - Turn direction
  - Leg length
  - EFC

NOTE: To change alternate airport and Runway Visual Range, select the aircraft in the ACL, Template, More, and type in updated data.

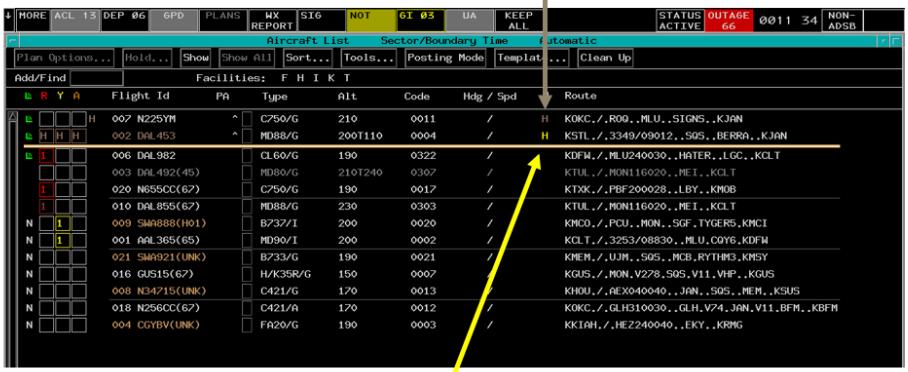
Continued on next page

EDST ENTRIES *(Continued)*

Coordination and Hold Menus (Cont'd)
TI6110.101, par. 4.6.16

HOLD INDICATORS

Brown H indicates there is Hold Data for an aircraft



Yellow H indicates that the EFC time will soon expire

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- Hold indicators include:
  - A brown H indicates there is Hold Data for an aircraft
  - A yellow H indicates that the EFC time will soon expire

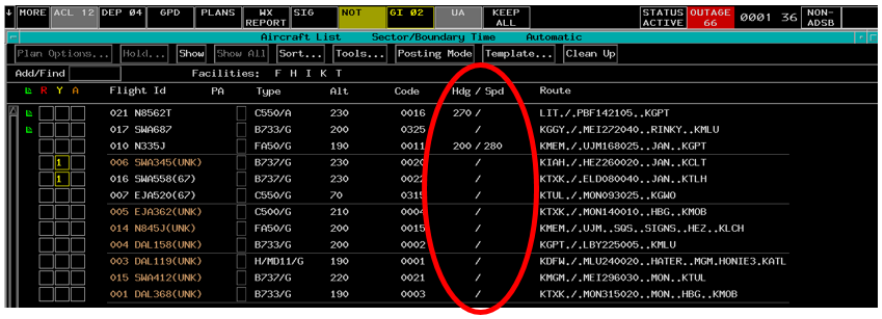
Coordination and Hold Menus CBI

- In the Coordination and Hold Menus CBI, you will:
  - Learn about the coordination and hold menu elements
  - Enter and delete coordination data
  - Enter, delete, modify, and display hold data

EDST ENTRIES *(Continued)*

Heading and Speed Columns
TI6110.101, par. 4.6.15

HEADING AND SPEED COLUMNS



ERAM data is white; scratchpad data is yellow

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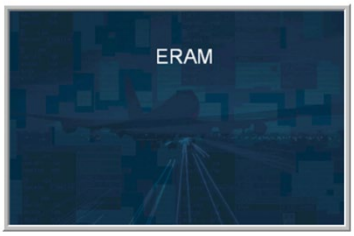
Heading and Speed Columns CBI

⊙ In the Heading and Speed Columns CBI, you will:

- Recognize the display of heading and speed data
- Interpret color and other coding in the Heading/Speed column
- Enter and delete heading/speed data in ERAM and scratchpad

EDST CBIs

CBIs FOR LESSON PLAN PAGES 58-70



- **Templates**
- **Altitude Amendments**
- **Route Amendments**
- **Coordination and Hold Menus**
- **Heading and Speed Columns**

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EDST ENTRIES *(Continued)*

Message Practice 3

NOTE: For students checklists are in the handout section of their binders labeled “Computer Message Checklists MP 1 – 4 HO”. Checklists for instructors are in binders in each classroom and should be handed out for the scenario and then picked up by the lead instructor.

IN CONCLUSION

Lesson Review

LESSON REVIEW

The following topics were covered in this lesson:

- **ERAM purpose and functions**
- **EDST benefits**
- **RA position hardware and keyboard**
- **Computer messaging**
- **EDST entries**

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APPENDIX A: ABBREVIATIONS AND CONTROL SYMBOLS

Clearance Abbreviations
JO 7110.65,
tbl 13-1-1

ABBREVIATION	MEANING
A	Cleared to airport (point of intended landing)
B	Center clearance delivered
C	ATC clears (when clearance relayed through non-ATC facility)
CAF	Cleared as filed
D	Cleared to depart from the fix
F	Cleared to the fix
H	Cleared to hold and instructions issued
N	Clearance not delivered
O	Cleared to the outer marker
PD	Cleared to climb/descend at pilot's discretion
Q	Cleared to fly specified sectors of a NAVAID defined in terms of courses, bearings, radials, or quadrants within a designated radius
T	Cleared through (for landing and takeoff through intermediate point)
V	Cleared over the fix
X	Cleared to cross (airway, route, radial) at (point)
Z	Tower jurisdiction

APPENDIX A: ABBREVIATIONS AND CONTROL SYMBOLS *(Continued)*

Miscellaneous Abbreviations
JO 7110.65,
tbl 13-1-2

ABBREVIATION	MEANING
BC	Back course approach
CT	Contact approach
FA	Final approach
FMS	Flight management system approach
GPS	GPS approach
I	Initial approach
ILS	ILS approach
MA	Missed approach
MLS	MLS approach
NDB	Nondirectional radio beacon approach
OTP	VFR conditions-on-top
PA	Precision approach
PT	Procedure turn
RA	Resolution advisory (Pilot-reported TCAS event)
RH	Runway heading
RNAV	Area navigation approach
RP	Report immediately upon passing (fix/altitude)
RX	Report crossing
SA	Surveillance approach
SI	Straight-in approach
TA	TACAN approach
TL	Turn left
TR	Turn right
VA	Visual approach
VR	VOR approach

APPENDIX A: ABBREVIATIONS AND CONTROL SYMBOLS *(Continued)*

EDST Equivalents for Control Information Symbols
JO 7110.65, tbl 13-1-3

ABBREVIATION	MEANING
T *dir*	Depart (direction if specified)
↑	Climb and maintain
↓	Descend and maintain
CR	Cruise
AT	At
X	Cross
M	Maintain
/airway	Join or intercept (airway, jet route, track, or course)
=	While in controlled airspace
WICA	While in control area
dir ECA	Enter control area
dir OOCA	Out of control area
dir ESA	Cleared to enter surface area. Indicated direction of flight by appropriate compass letter(s)
TSA *alt*	Through surface area and altitude indicated direction of flight by appropriate compass letter(s). Maintain special VFR conditions (altitude if appropriate) while in surface area
250 K	Aircraft requested to adjust speed to 250 knots
-20 K	Aircraft requested to reduce speed 20 knots
+30 K	Aircraft requested to increase speed 30 knots
SVFR	Local Special VFR operations in the vicinity of (name) airport are authorized until (time). Maintain special VFR conditions (Altitude if appropriate)
B4	Before
AF	After or Past
/	Until
instructions	Alternate instructions
REST	Restriction
AOB	At or Below
AOA	At or Above
-	From-to (Route, time, etc.)
(Alt)B(Alt)	Indicates a block altitude assignment. Altitudes are inclusive, and the first altitude shall be lower than the second (Example 310B370)

Continued on next page

APPENDIX A: ABBREVIATIONS AND CONTROL SYMBOLS *(Continued)*

EDST Equivalents for Control Information Symbols (Cont'd)
JO 7110.65, tbl 13-1-3

ABBREVIATION	MEANING
V *time*	Clearance void if aircraft not off ground by *time*
CL	Pilot canceled flight plan
+info+	Information or revised information forwarded
alt	Other than assigned altitude reported Example" **50**
ARC *mi. dir.*	DME arc of VORTAC, TACAN, or MLS
C *freq.*	Contact (facility) or (freq.), (time, fix, or altitude if appropriate). Insert frequency only when it is other than standard
R	Radar contact
R *alt*	Requested altitude
R/	Radar service terminated
RX	Radar Contact Lost
RV	Radar vector
RVX	Pilot resumed own navigation
HO	Handoff completed
E	Emergency
W	Warning
P	Point out initiated. Indicate the appropriate facility, sector, or position.
FUEL	Minimum fuel
EFC *time*	Expect further clearance at (time)
- *fix*	Direct to fix
FRC	Full route clearance
IAF	Initial approach fix
NORDO	No Radio
PT	Procedure turn
RLS	Release
REQ	Request
SI	Straight in

FP – AID TYP (BCN) SPD FIX TIM ALT/RAL RTE

RTE (QU)

HALO (QPJ)

PVD (QP)

DM

TRK (QT)

DROP TRK (QX)

RS

ALT (QZ)

INT (QQ)

CODE (QB)

SR

HOLD (QH)

AM

VP

Continued on next page

USING HOT NONE KEY

Handoffs:

Offset a FDB:

Change leader line:

Force data block:

4th line (QS):