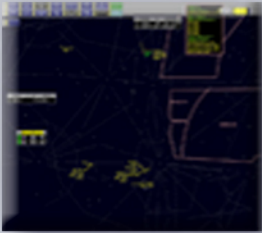




# FAA Lesson Plan

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## En Route Stage 4 Radar Controller Training

H	DEPT	
JFK		
AAL321	60	
SWA123	150	
LGA		
N2234	340	
PHL		
UAL167	50	
N133A	120	
N12A	UFR	
N11A	OTP	

## Instructor

## Radar Identification Lesson 6



**55055**  
**V.1.06**



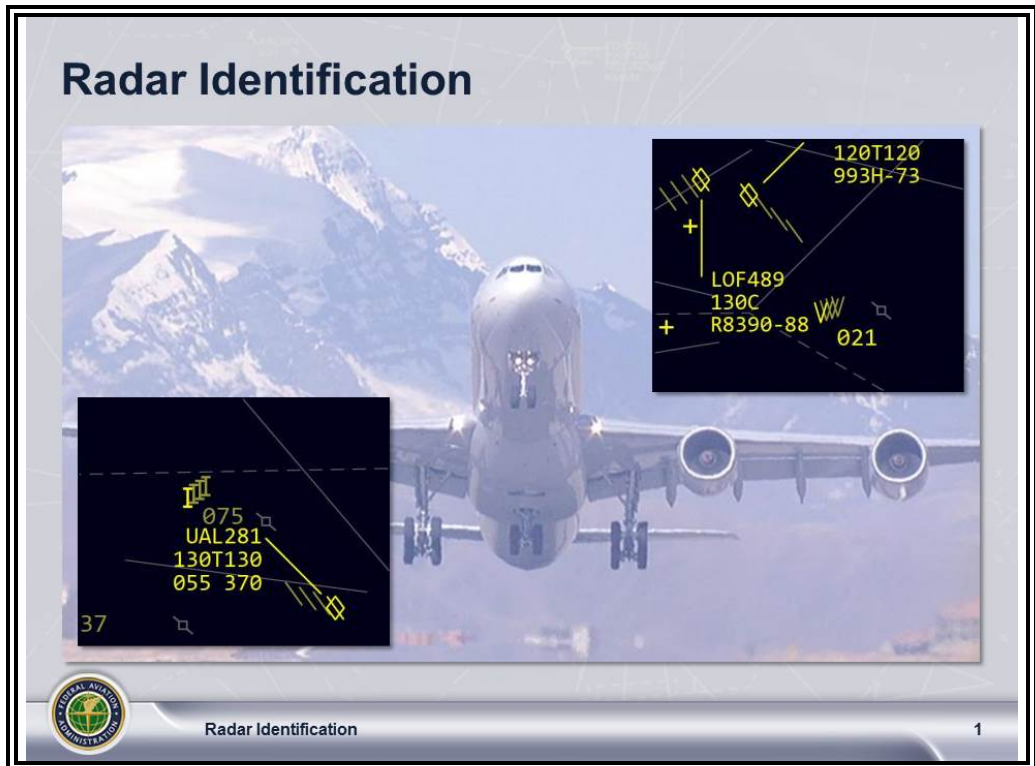
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## LESSON PLAN DATA SHEET

<b>COURSE NAME:</b>	RADAR CONTROLLER TRAINING
<b>COURSE NUMBER:</b>	55055
<b>LESSON TITLE:</b>	RADAR IDENTIFICATION
<b>DATE REVISED:</b>	2014-04
<b>VERSION:</b>	V.1.06
<b>REFERENCES:</b>	JO 7110.65V, Air Traffic Control; JO 7110.311B, Procedural Guidance for FAA Order JO 7110.65 following En Route Automation Modernization (ERAM) Implementation; TI 6110.100, En Route Automation Modernization (ERAM) Air Traffic Manual (ATM): R-Position User Manual; TI 6110.141, En Route Automation Modernization (ERAM) System Adaptation Manual (SAM): Local Data Panels; ERAM EDSM SRS 210.01 V1B1, En Route Automation Modernization (ERAM) En Route Display Management (EDSM) R-Position and General EDSM Requirements, Volume 1, Book 1; ERAM EDSM SRS 210.01 V1B1, En Route Automation Modernization (ERAM) En Route Display Management (EDSM) R-Position and General EDSM Requirements, Volume 1, Book 2; ERAM SIG 1063, Force Pairing On Other Beacon Code
<b>HANDOUTS:</b>	NONE
<b>EXERCISES:</b>	YES, SCENARIO-BASED EXERCISE TO BE COMPLETED AFTER LESSON 8 ( <i>REFER TO 55055-H008.PDF, PRACTICE EXERCISE</i> )
<b>END-OF-LESSON TEST:</b>	YES ( <i>REFER TO 55055-ELT06B.PDF [BLACK/WHITE] OR 55055-ELT06C.PDF [COLOR].</i> )
<b>PERFORMANCE TEST:</b>	NONE
<b>MATERIALS:</b>	NONE
<b>OTHER PERTINENT INFORMATION:</b>	THIS LESSON IS BASED ON ERAM BUILD EAC1500. THE LESSON HAS BEEN REVIEWED AND REFLECTS CURRENT ORDERS AND MANUALS AS OF APRIL 2014.

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# INTRODUCTION



The Air Traffic Control System depends on radar identification and cooperation between controllers and pilots. Each must understand what the other is attempting to do. Learning the procedures and phraseology presented in this lesson will help you understand how the system works. Your knowledge of this material will be essential when you enter radar On-the-Job Training (OJT).

## Purpose

This lesson covers the criteria for establishing and maintaining radar identification of an aircraft, along with the appropriate command entries.

# INTRODUCTION *(Continued)*

---

## Objectives



### Objectives


At the end of this lesson, you will be able to identify:

1. Primary and beacon identification methods and associated phraseology
2. Questionable identification procedures
3. Target marker requirements
4. Radar fix posting requirements
5. Free and Flat Track symbols
6. Characteristics of selected R-Position command entries



Radar Identification

2

 **NOTE:** Review the lesson objectives.

---

# OVERVIEW

## Providing Radar Service

JO 7110.65,  
pars. 5-3-1, 5-3-5,  
5-3-7



## Providing Radar Service

- Before you provide any radar service:
  - Establish and maintain unquestionable radar identification.

“CITATION ONE ROMEO,  
RADAR CONTACT.”



Radar Identification

3

☞ **NOTE:** Teach from graphic.


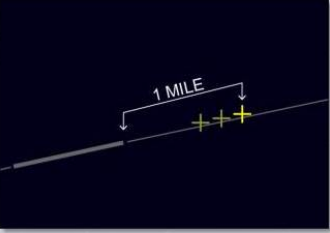

# PRIMARY RADAR IDENTIFICATION

## Primary Target Identification

JO 7110.65,  
pars. 5-3-2, 5-3-7




### Primary Target Identification



“NOVEMBER SIX  
ONE SEVEN  
BRAVO, RADAR  
CONTACT.”

ARTCC



Radar Identification

4

- ⦿ Primary radar identification methods are not limited to primary targets, but can also be applied to beacon targets.
- ⦿ Identify a primary or radar beacon target using one of three methods, as follows:
  - **Method One:** Observe departing aircraft within 1 mile of takeoff runway end, provided:
    - The airport has an operating control tower.
    - Proper coordination is accomplished by either a verbal or nonverbal rolling or boundary notification for each departure.
    - The runway is depicted on the Situation Display.

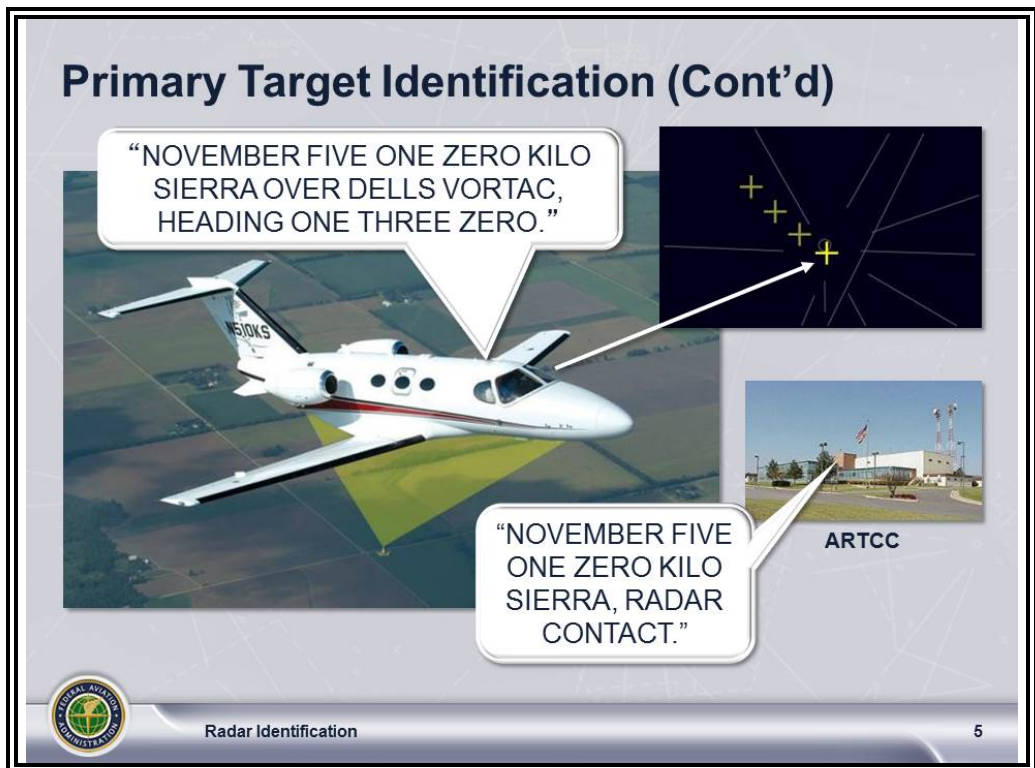
*Continued on next page*



# PRIMARY RADAR IDENTIFICATION *(Continued)*

## Primary Target Identification (Cont'd)

JO 7110.65,  
pars. 5-3-2, 5-3-7



- **Method Two:** Observe a target that meets the following criteria:
  - Position with respect to a fix or visual reporting point corresponds with a direct position report received from the aircraft.
  - Fix must be displayed on the Situation Display, scribed on the map overlay, or displayed as a permanent echo.
  - Visual reporting point must have a fix range and azimuth that is determined by supervisory personnel, and its position information made available to you, as the controller.
  - Track is consistent with the reported heading or route of flight.

*Continued on next page*

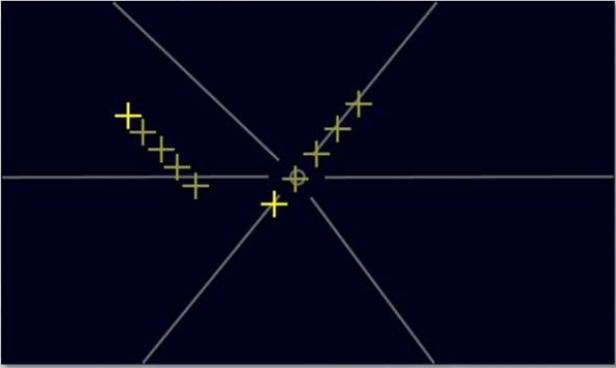
# PRIMARY RADAR IDENTIFICATION *(Continued)*

## Primary Target Identification (Cont'd)


JO 7110.65,  
par. 5-3-2



### Primary Target Identification (Cont'd)



Target Movement is SW-Bound + Known Route of Aircraft is SE-Bound = Not Correct Target



Radar Identification

6

**Example:** In the illustration above, the aircraft reports over the VOR, but the only observed target is tracking a direction **not** consistent with known route. Observed target is **not** correct target.

*Continued on next page*

# PRIMARY RADAR IDENTIFICATION *(Continued)*


## Primary Target Identification (Cont'd)

JO 7110.65,  
par. 5-3-2



### Primary Target Identification (Cont'd)

Target Movement is SE-Bound + Known Route of Aircraft is SE-Bound = Correct Target

 Radar Identification 7

**Example:** In the illustration above, the aircraft reports over the VOR and is tracking in the correct direction; you have the correct target.

*Continued on next page*

# PRIMARY RADAR IDENTIFICATION *(Continued)*

## Primary Target Identification (Cont'd)

JO 7110.65,  
pars. 5-3-2, 5-3-7




*Click to  
animate.*

### Position Report

"NOVEMBER TWO FOUR PAPA, RADAR CONTACT."

"NOVEMBER TWO FOUR PAPA FIVE MILES SOUTHWEST GREENVILLE VOR, SOUTHWEST BOUND."

 Radar Identification [Click to Play Animation](#) 8



*Click to  
animate.*

### Primary Target Identification


"EAGLE ONE TWO APPROXIMATELY 5 MILES SOUTHWEST OF BIG MOUNTAIN WESTBOUND."

"Big Mountain" Permanent Echo

"Big Mountain" (Permanent Echo)

"EAGLE ONE TWO, RADAR CONTACT."

ARTCC

 Radar Identification [Click to Play Animation](#) 9

*Continued on next page*

# PRIMARY RADAR IDENTIFICATION *(Continued)*


## Primary Target Identification (Cont'd)

JO 7110.65,  
pars. 5-3-2, 5-3-7



*Click twice to  
animate.*

### Primary Target Identification (Cont'd)




The diagram shows a radar site marked with an asterisk and an arrow. A horizontal line extends from the radar site to the left, labeled "270°/30 MILES". Along this line, three yellow plus signs are positioned, representing a target's path. A speech bubble points to the first plus sign.


"BEAR LAKE IS TWO SEVEN ZERO DEGREES, THIRTY MILES FROM THE RADAR SITE ACCORDING TO FLIGHT CHECK."

"PIPER FOUR ZERO TANGO OVER BEAR LAKE."

"PIPER FOUR ZERO TANGO, RADAR CONTACT."



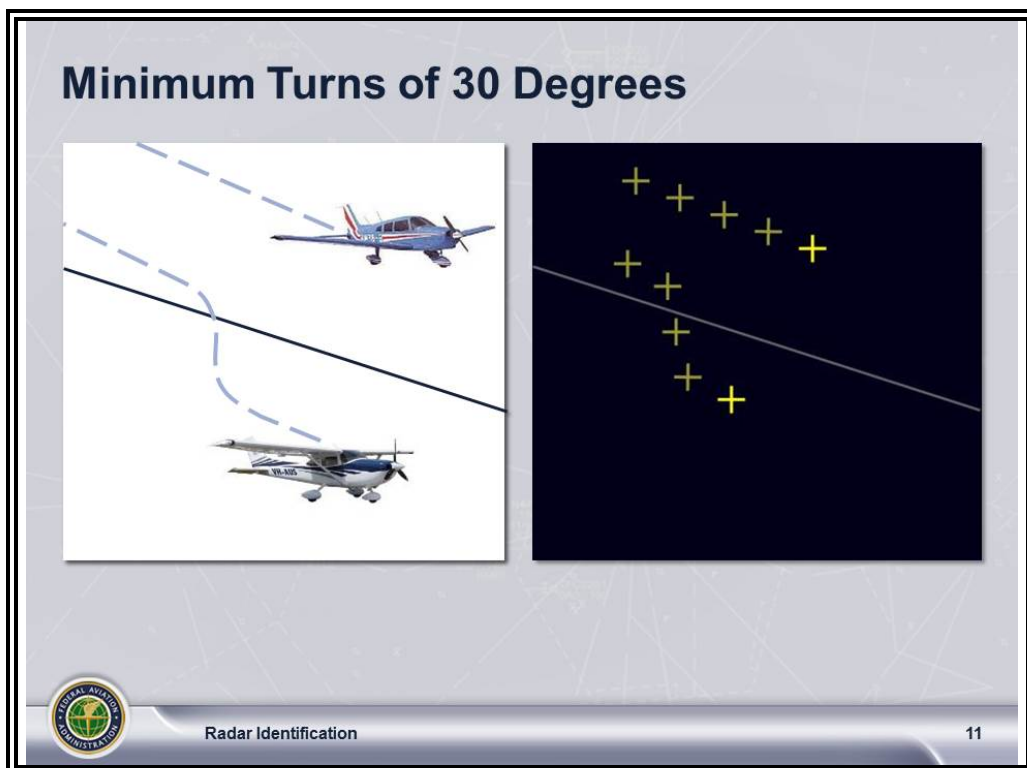
The photo shows two men in a control room. One man is pointing at a large radar screen displaying a target. The other man is looking on.

 Radar Identification [Click to Play Animation](#) 10

# PRIMARY RADAR IDENTIFICATION *(Continued)*

## Identifying Turns

JO 7110.65,  
par. 5-3-2



- **Method Three:** Observe a target making identifying turn(s) of a minimum of 30 degrees provided:
  - You have a report assuring that the aircraft is within radar coverage (except lost aircraft).
  - Only one aircraft is observed making turn(s).
- For aircraft operating in accordance with an IFR clearance, do one of the following:
  - Issue a heading away from an area that will require an increased minimum IFR altitude due to terrain or obstructions.
  - Have the aircraft climb to the highest minimum altitude in your jurisdiction before issuing a heading.

**NOTE:** Use of identifying turns or headings that would cause the aircraft to follow normal IFR routes or known VFR flight paths might result in misidentification. When these circumstances cannot be avoided, additional methods of identification may be necessary.



## PRIMARY RADAR IDENTIFICATION *(Continued)*

---

### Review



### Response Item

A departing aircraft is identified when a target is observed within \_\_\_\_\_ mile(s) of the takeoff runway end.

- A. 1
- B. 3
- C. 5



Radar Identification

[Click to Show Answer](#)

12

**SLIDE ANSWER:** A

---

*Continued on next page*

## PRIMARY RADAR IDENTIFICATION *(Continued)*

### Review



### Response Item

An aircraft has reported over the Greenville VOR, which is displayed on the Situation Display. To radar identify the aircraft, the \_\_\_\_\_.

- A. radials of the VOR must be displayed
- B. aircraft heading must be consistent with the known route of flight
- C. aircraft must be equipped with a transponder



Radar Identification

[Click to Show Answer](#)

13

**SLIDE ANSWER: B**

*Continued on next page*



## PRIMARY RADAR IDENTIFICATION *(Continued)*

---

### Review



### Response Item

When using turns for radar identification, the minimum number of degrees for each turn is \_\_\_\_\_.

- A. 25
- B. 30
- C. 45



Radar Identification

[Click to Show Answer](#)

14

**SLIDE ANSWER: B**

---

*Continued on next page*

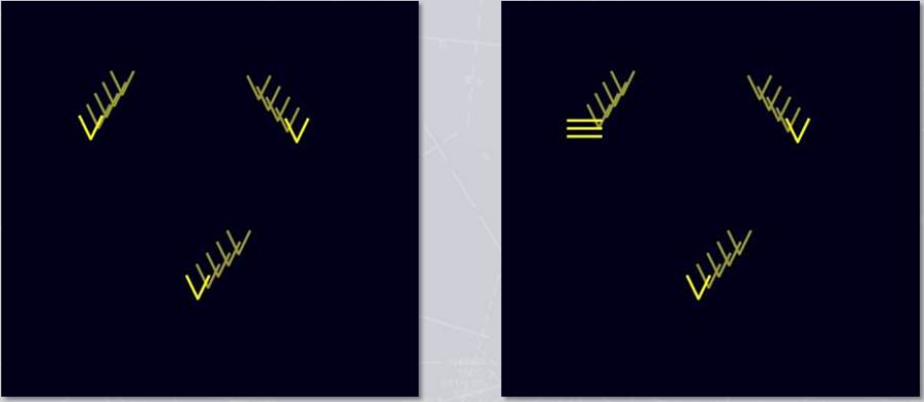
# BEACON TARGET IDENTIFICATION

## IDENT


JO 7110.65,  
par. 5-3-3



### IDENT Phraseology Example



“CESSNA ONE TWO FOUR LIMA, IDENT.”



Radar Identification

15

- ⊙ When using only Mode 3/A radar beacon to identify a target, use one of the following methods:

- Request a pilot to ident and observe the display change.



## Phraseology

“IDENT,”

or

“SQUAWK (code) AND IDENT.”

# BEACON TARGET IDENTIFICATION *(Continued)*

## Review



### Response Item

The phraseology to identify N18X, an Aztec, using the ident method is \_\_\_\_\_.

- A. "AZTEC ONE EIGHT X-RAY, IDENT"
- B. "AZTEC ONE EIGHT X-RAY, SQUAWK THREE ONE FOUR SEVEN AND IDENT"
- C. either A or B
- D. neither A or B



Radar Identification

[Click to Show Answer](#)

16

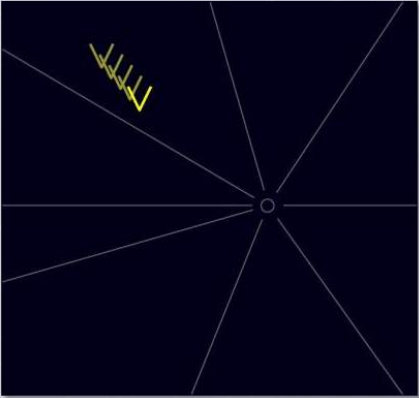
**SLIDE ANSWER: C**

# BEACON TARGET IDENTIFICATION *(Continued)*

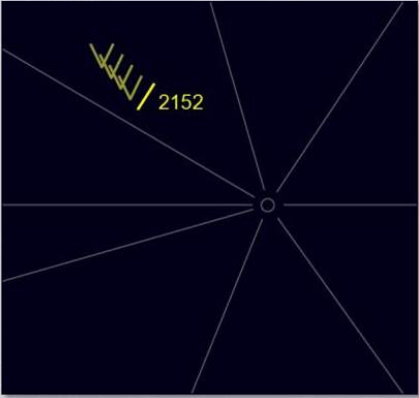
**Code Change**  
JO 7110.65,  
pars. 5-3-3, 5-3-7




## Code Change Phraseology Example



"BONANZA ONE FOUR KILO, SQUAWK TWO ONE FIVE TWO."



"BONANZA ONE FOUR KILO, RADAR CONTACT ONE FIVE MILES NORTHWEST OF MCALESTER VORTAC."



Radar Identification

17

- Change aircraft to a specific discrete or nondiscrete code and observe change.


## BEACON TARGET IDENTIFICATION *(Continued)*

### Change to Standby

JO 7110.65,  
par. 5-3-3



### Change to Standby




1

2

3

1. “(ACID), SQUAWK STANDBY.”
2. Beacon Disappears.
3. “(ACID), SQUAWK NORMAL.”



Radar Identification

18

- Request the aircraft change the transponder to standby, then return transponder to normal operations, and observe the beacon disappear and reappear.

👉 **NOTE:** Teach from graphic.

## BEACON TARGET IDENTIFICATION *(Continued)*

---

### Review



### Response Item

Careful consideration must be given to terrain features when identifying an aircraft by the use of \_\_\_\_\_.

- A. position correlation
- B. turns
- C. code change



Radar Identification

[Click to Show Answer](#)

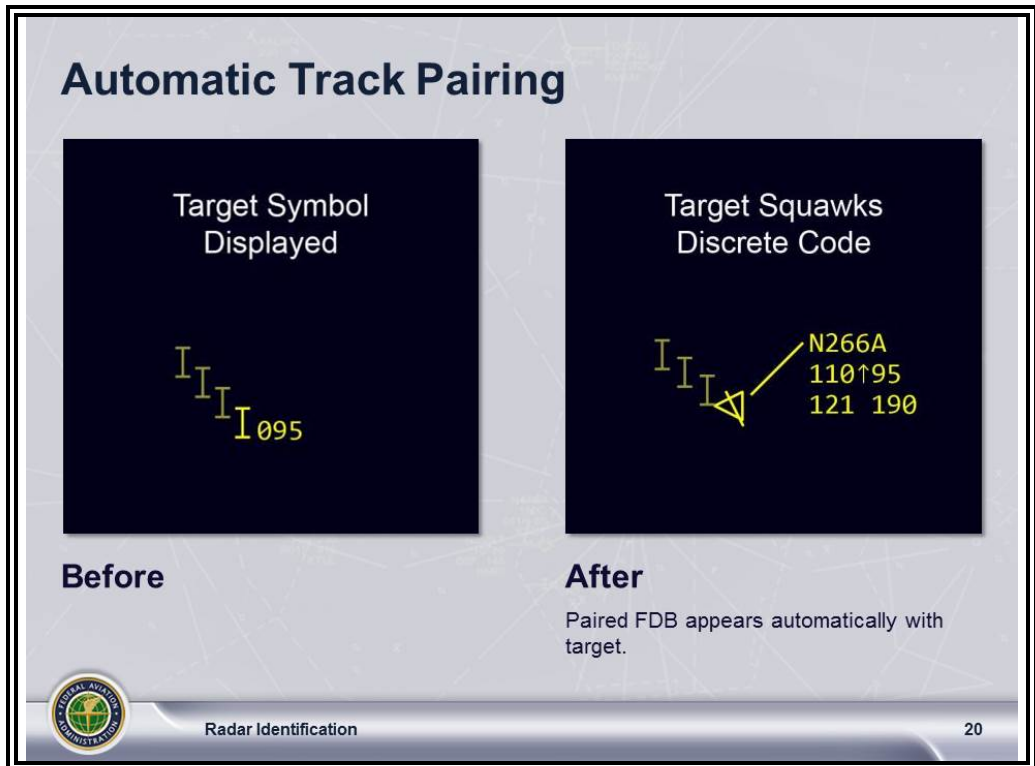
19

**SLIDE ANSWER: B**

---

# BEACON TARGET IDENTIFICATION *(Continued)*

## Automatic Track Pairing JO 7110.311B, par. 5-3-3



- An aircraft may be considered identified when the full data block is automatically associated with the beacon target symbol of an aircraft that is squawking a discrete code assigned by the computer.



## Phraseology

“(ACID), SQUAWK (4-digit discrete code),

or

“(ACID), SQUAWK (4-digit discrete code), AND IF YOUR ALTITUDE REPORTING EQUIPMENT IS TURNED OFF, SQUAWK ALTITUDE.”

## BEACON TARGET IDENTIFICATION *(Continued)*

---

### Review



### Response Item

An aircraft may be considered identified when the Full Data Block is automatically associated with the beacon target symbol of an aircraft that is squawking a discrete code assigned by the computer.

- A. True
- B. False



Radar Identification

[Click to Show Answer](#)

21

**SLIDE ANSWER:** A

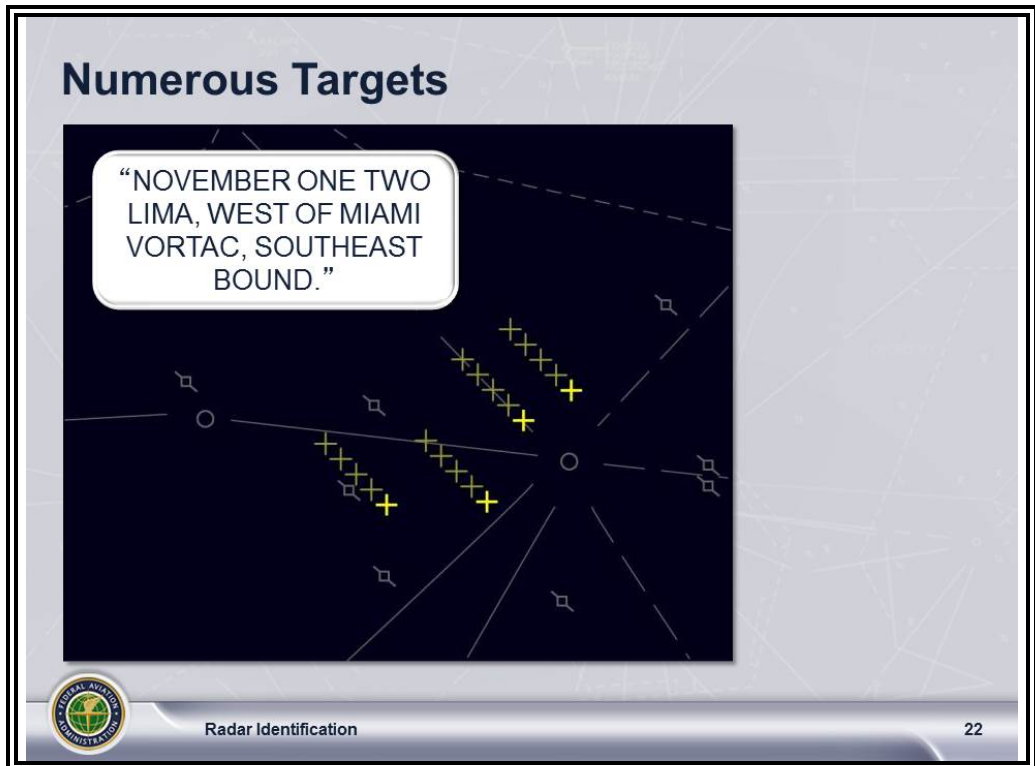
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# QUESTIONABLE IDENTIFICATION

## Circumstances Leading to Questionable Identification

JO 7110.65,  
par. 5-3-5



- ⊙ There are a number of circumstances that could lead to questionable identification. These include:
  - Numerous targets in the same vicinity

*Continued on next page*

## QUESTIONABLE IDENTIFICATION *(Continued)*



### Circumstances Leading to Questionable Identification (Cont'd)

JO 7110.65,  
par. 5-3-5



### Duplicate Beacon Responses

"NOVEMBER FOUR FIVE  
HOTEL IDENTING  
NORTH OF MIAMI  
VORTAC."



Radar Identification

23

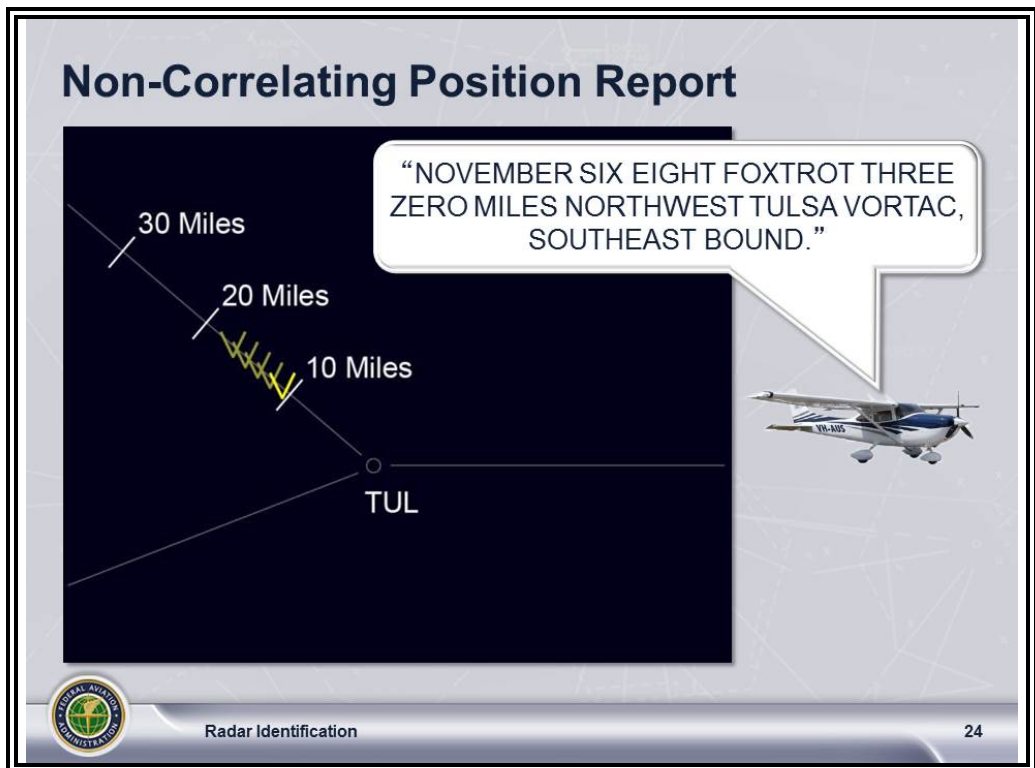
- Duplicate beacon responses

*Continued on next page*

## QUESTIONABLE IDENTIFICATION *(Continued)*

### Circumstances Leading to Questionable Identification (Cont'd)

JO 7110.65,  
par. 5-3-5



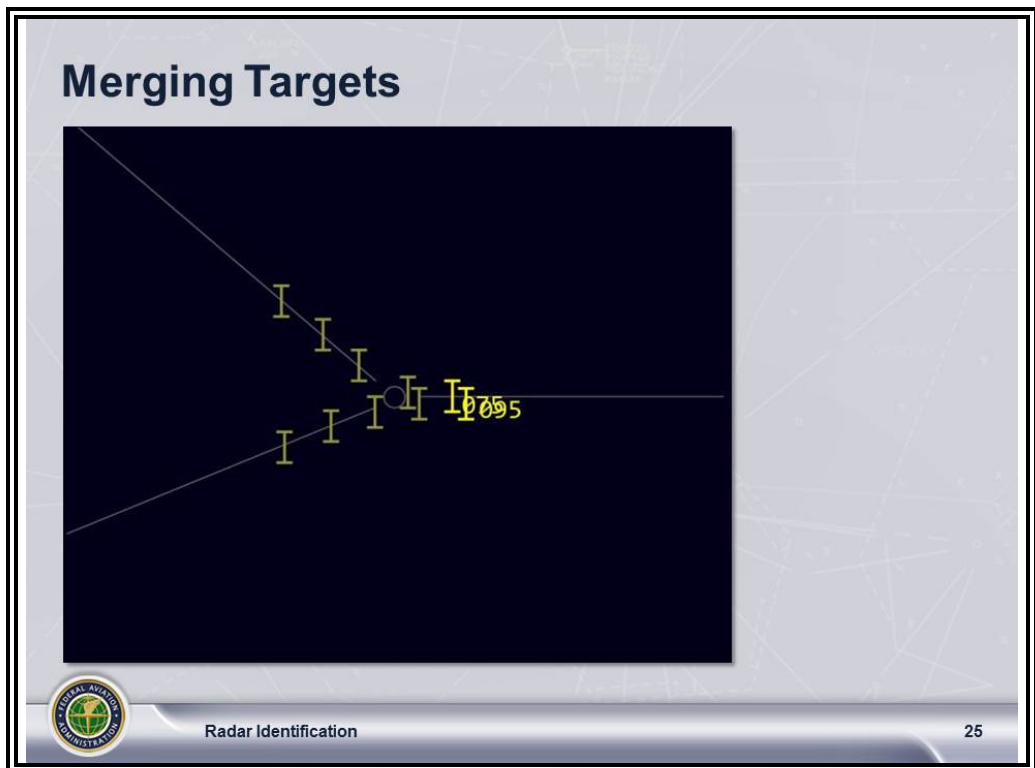
- Non-correlating position report

*Continued on next page*

# QUESTIONABLE IDENTIFICATION *(Continued)*

## Circumstances Leading to Questionable Identification (Cont'd)

JO 7110.65,  
par. 5-3-5



- Merging targets

## Ensuring Correct Identification

JO 7110.65,  
pars. 5-3-2, 5-3-3,  
5-3-5

- ⊙ When identification is in doubt for any reason, in accordance with FAA Order JO 7110.65, pars. 5-3-2 and 5-3-3:
  - Use more than one identification method.
  - Re-identify or terminate radar service.
  - Ensure that all primary targets are displayed when radar identification is lost or is questionable.

# IDENTIFICATION STATUS

---


## Overview

JO 7110.65,  
par. 5-3-7



### Identification Status Overview

- Inform an aircraft of radar contact when:
  - Radar contact is established.
  - Radar contact is lost.



Radar Identification

26

☉ Inform an aircraft of radar contact when:

- Radar contact is established.
- Radar contact is lost.

**NOTE:** Radar service can also be terminated.

---

# IDENTIFICATION STATUS *(Continued)*


## Radar Contact

JO 7110.65,  
par. 5-3-7





### Radar Contact Phraseology Example

"NOVEMBER FOUR THREE OSCAR, RADAR CONTACT."



"NOVEMBER FOUR THREE OSCAR ONE ZERO MILES WEST GREENVILLE VOR, IDENTING."



 Radar Identification [Click to Play Animation](#) 27

*Click to  
animate.*

⦿ Aircraft are considered to be in **radar contact** when:

- Initial radar identification has been established.
- Radar identification is reestablished.



## Phraseology

"RADAR CONTACT (position, if required)."

# IDENTIFICATION STATUS *(Continued)*

## Radar Contact Lost

JO 7110.65,  
par. 5-3-7



### Radar Contact Lost Phraseology Example

N22B  
160XXXX  
121NONE

“NOVEMBER TWO TWO BRAVO, RADAR CONTACT LOST.”

ARTCC

Radar Identification 28

☉ Inform an aircraft **Radar Contact Lost** when:

- Identification is still desired, but is lost due to an uncontrollable situation; for example:
  - Radar failure
  - No target return



## Phraseology

“RADAR CONTACT LOST, (alternative instructions, when required).”

# POSITION INFORMATION




## Requirements

JO 7110.65,  
par. 5-3-6



### Position Information

"BEECHCRAFT TWO TWO BRAVO, RADAR CONTACT ONE ZERO MILES WEST OF GREENVILLE VOR."



Radar Identification

29

- ☉ Inform the aircraft of its position when identified by:
  - Beacon methods or (see next slide)

*Continued on next page*



## POSITION INFORMATION *(Continued)*

### Requirements (Cont'd)


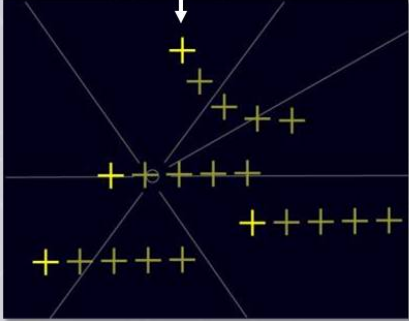
JO 7110.65,  
par. 5-3-6




### Position Information

30-degree turn is observed by the controller

"PIPER ONE EIGHT LIMA, RADAR CONTACT SIX MILES NORTH OF MIAMI VORTAC."



ARTCC



Radar Identification

30

- Turns
- ⊙ You need **not** inform an aircraft of its position when identification is established:
- By position correlation, or
  - When a departing aircraft is identified within 1 mile of the takeoff runway end

## POSITION INFORMATION *(Continued)*

### Review



### Response Item

The phraseology to inform UAL11 of radar contact is, “UNITED ELEVEN, \_\_\_\_\_.”

- A. CONTACT (position if required)
- B. RADAR CONTACT (position if required)
- C. RADAR CONTACTED (position if required)



Radar Identification

[Click to Show Answer](#)

31

**SLIDE ANSWER: B**

*Continued on next page*

## POSITION INFORMATION *(Continued)*

---

Review  
(Cont'd)



### Response Item

An aircraft must be advised of its position when initial radar identification is established \_\_\_\_\_.

- A. using turns of 30 degrees or more
- B. by position correlation
- C. within 1 mile of the takeoff runway end



Radar Identification

[Click to Show Answer](#)

32

**SLIDE ANSWER:** A

---

# RADAR SERVICE TERMINATION

## Radar Service Termination

JO 7110.65,  
par. 5-1-13



- ⊙ Inform the aircraft when radar service is terminated because identification is no longer:

- Necessary
- Possible



## Phraseology

“RADAR SERVICE TERMINATED, (nonradar routing, if required).”

- ⊙ Radar service is automatically terminated and aircraft need **not** be advised when:
  - Aircraft cancels IFR, except within Class B or C airspace
  - An aircraft conducting an instrument, visual, or contact approach has:
    - Landed, or
    - Been instructed to change to advisory frequency
- ⊙ At tower controlled airports (where radar coverage does **not** exist to within ½ mile of the runway end):
  - Inform arriving aircraft when radar service is terminated.

## RADAR SERVICE TERMINATION *(Continued)*

### Review



### Response Item

Radar service must be terminated when an aircraft \_\_\_\_\_.

- A. cancels IFR
- B. conducts a visual approach
- C. proceeds into a nonradar coverage area



Radar Identification

[Click to Show Answer](#)

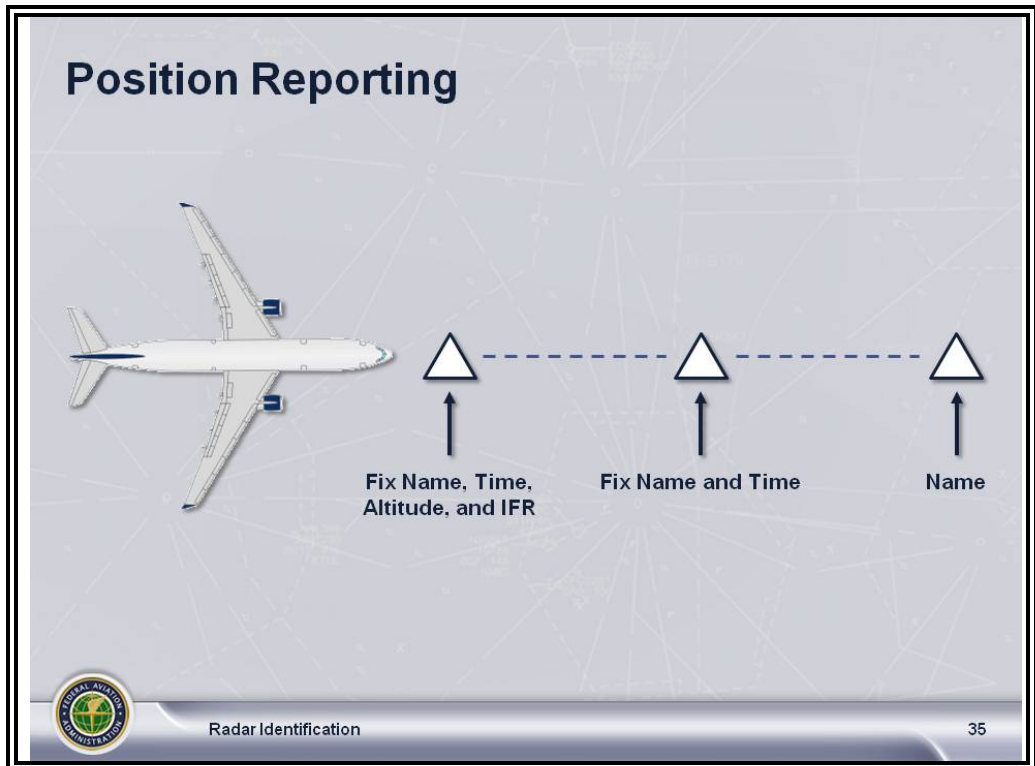
34

**SLIDE ANSWER: C**

# POSITION REPORTING

## Requirements

JO 7110.65,  
par. 5-1-12



### ☉ Position Reporting:

- If necessary, request aircraft to provide an estimate or report over a specific fix.
- When an aircraft is issued “RADAR CONTACT,” the pilot will discontinue reporting compulsory reporting points until advised:
  - “RADAR CONTACT LOST,” or
  - “RADAR SERVICE TERMINATED.”
- When required, inform an aircraft of its position with respect to a fix or airway.

## Review

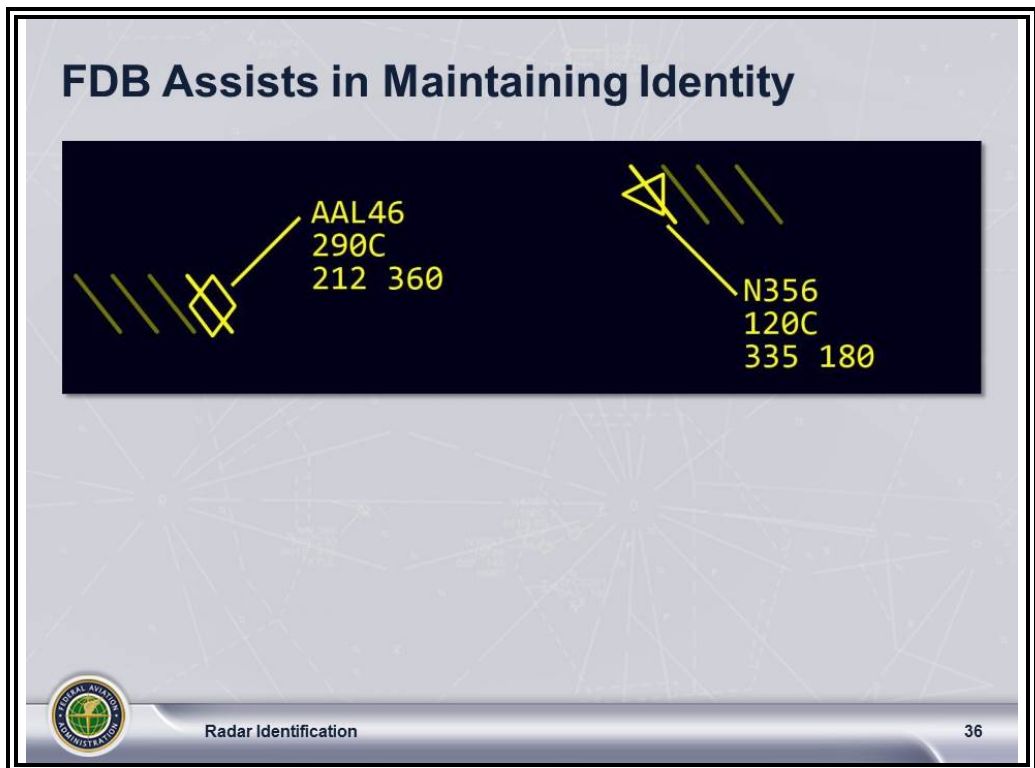
❖ **QUESTION:** N127LP, a C172 has been identified solely by observing a code change. The radar controller advised N127LP “RADAR CONTACT.” Is this all that is required on the part of the controller? Explain.

**ANSWER:** No. Aircraft position must also be relayed to the pilot.

# TARGET MARKERS

## Maintaining Identity

JO 7110.65,  
par. 5-3-8;  
JO 7110.311B,  
par. 5-3-8



- ⦿ When you have separation responsibility for an aircraft and a paired track exists, display a Full Data Block (FDB).
- ⦿ Retain the FDB that is associated with the appropriate target symbol in order to maintain continuous identity of aircraft.
  - Retain the FDB until the aircraft has exited the sector or delegated airspace, and all potential conflicts have been resolved.
    - Including an aircraft that is a point out
    - The displayed altitude may be assigned, interim, or reported.

*Continued on next page*



# PAIRING

## Manually Pair Track

ERAM EDSM SRS  
210.04 V1B2,  
Sections C.1, C.2  
and C.8;  
ERAM SURV SRS  
210.24, par. 3.2.2.5



**Manually Pair Track**

QT ▽ N3731T

TRK

Command Input: QT <TBP> FLID <KBE>

**Before:** III 3435 085

**After:** II ♦ N3731T 90185 249 130

Radar Identification 37

- ⊙ The QT command identifies a target for manual pairing and creates a FDB.
  - Syntax: QT <TBP> FLID <KBE>
  - Adds the target's code to the Beacon Code View (if not already there)
- ⊙ Basic procedure:
  - Identify target.
  - Press Track Function Key.
  - Slew trackball cursor over target.
  - Trackball Pick (TBP).
    - From the RA position, // followed by a fix (no space between)
  - Enter Flight Identification (FLID).
  - Press Keyboard Enter key.
- ⊙ Optional fields (Manually Pair Track)

*Continued on next page*



## PAIRING (Continued)

### Manually Pair Track (Cont'd)

TI 6110.101; ERAM  
EDSM SRS 210.04  
V1B1; ERAM  
EDSM SRS 210.04  
V1B2, Appendix  
C.8 Table 29



### Pair Primary Track

QT P ▽ N731GP

TRK

Command Input: QT P <TBP> FLID <KBE>

Before:  
+++

After:  
+++ ✕

N731GP  
70N  
352 120

38

- ⊙ The QT P command allows you to manually pair a beacon-equipped flight to a primary track.

- Syntax: QT P <TBP> FLID <KBE>

**NOTE:** This command allows pairing on a flight with an equipment qualifier specifying a transponder when only a primary target is visible. The P field is not needed on flight plans without transponders, e.g., /X, /D, /M, /Y, /V, /H.

*Continued on next page*

## PAIRING (Continued)

### Manually Pair Track (Cont'd)

SIG 1063



**Force Pairing (QT D)**

QT D ▽ N3731T


TRK


Command Input: QT D <TBP> FLID <KBE>

**Before:**

III 3435  
085

**After:**

II  N3731T  
90↑85  
249 214

 Radar Identification 39

- ⊙ The QT D command allows you to manually pair an FDB to a target replying on an incorrect beacon code.
  - Syntax: QT D <TBP> FLID <KBE>
    - The beacon code would time share in field E of the data block.
  - If you pick an unpaired target, it will create and pair the FDB immediately.
  - If no target is found, it will place the FDB at the pick point.
  - QT D is rejected if the aircraft is not beacon equipped unless it is a tentative flight plan with no equipage specified.
- ⊙ You can manually pair an FDB to a target even when:
  - The displayed code does not match the flight's assigned code.
  - A target is supported by beacon data but is ineligible for automatic pairing, i.e.:
    - Aircraft has a stuck transponder.
    - Transponder has been inadvertently changed.

*Continued on next page*

# PAIRING *(Continued)*

---

## Manually Pair Track (Cont'd)

TI 6110.101;  
TI 6110.141;  
ERAM EDSM SRS  
210.04 V1B1

### ⊙ Examples

- Aircraft enters sector from ATOP squawking a non-discrete BCN code, e.g., 2000
- Able to pair aircraft before establishing communication
- Established beacon code does not match flight plan beacon code due to:
  - Stuck transponder
  - Transponder having been inadvertently changed
- Aircraft violate airspace and are not in communication with ATC, e.g., mode C intruder
- Controller observes an unpaired target that matches a flight plan
  - Aircraft in STV (Surface Tracking Volume) want to pair the aircraft early

**NOTE:** STV - A Surface Tracking Volume is a vertical cylinder centered at the airport location within which new tracks are not established and existing tracks, if they do not exceed an adapted speed, are terminated.

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*Continued on next page*

## PAIRING (Continued)

### Manually Pair Track (Cont'd)

ERAM EDSM SRS  
210.04 V1B1,  
par. 3.2.2.3.2.1;  
ERAM EDSM SRS  
210.04 V1B2,  
Section C.1 and  
C.2





### Force Pairing (QT /E)


QT /E ▾ N3731T

TRK

Command Input: QT /E <TBP> FLID <KBE>

**Before:**  
III 3435  
085

**After:**  
II    
N3731T  
90↑85  
249 214

 Radar Identification 40

- ⊙ The QT /E command allows you to:
  - Pair to an external beacon code.
  - Specify an external beacon for the flight.
- ⊙ Syntax: QT /E <TBP> FLID <KBE>
  - The beacon code would time share in field E of the data block.

*Continued on next page*

## PAIRING (Continued)

**Manually Pair  
Track (Cont'd)**  
ERAM EDSM SRS  
210.04 V1B2,  
Section C.1  
and C.2



### Manual Pairing, Optional Fields

Format	Example
<b>Altitude:</b> ddd OTP/ddd VFR/ddd	080, 270 OTP, OTP/155 VFR, VFR/075
<b>Heading:</b> dd	02, 36
<b>Speed:</b> S(d)(d)dd	S440
<b>Command Input:</b> QT 080 02 S440 <TBP> FLID <KBE>	

Radar Identification41

- ⦿ Anytime a QT command is used and no flight plan exists, a tentative flight plan is created consisting of the FLID, beacon code, and CID.
- ⦿ Optional fields include:
  - Altitude (if included, creates a tentative flight plan with an assigned altitude)
  - Heading
  - Speed
  - Primary track indicator
  - Trackball coordinates

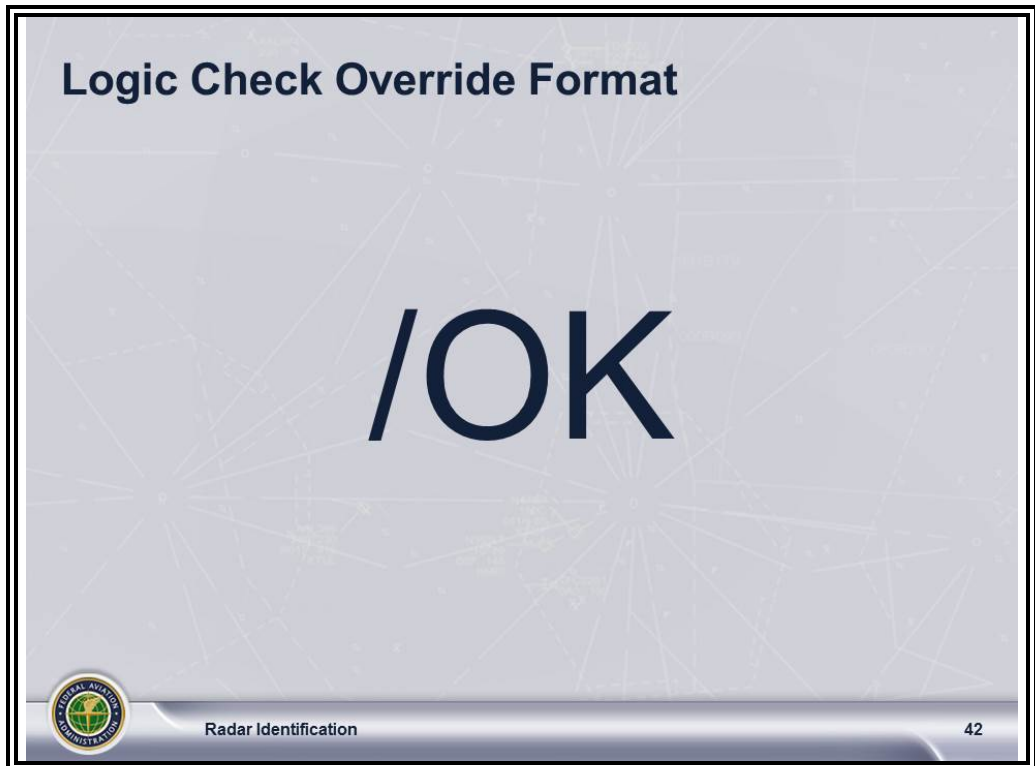
 **NOTE:** Teach from graphic.

*Continued on next page*

## PAIRING (Continued)

### Manually Pair Track (Cont'd)

JO 7110.65,  
par. 5-14-6;  
TI 6110.101;  
ERAM EDSM SRS  
210.04 V1B2,  
Section C1 and C2



- ⦿ The use of the /OK function is allowed to override sector eligibility only when one of the following conditions is met:
  - Prior coordination is affected.
  - The flight is within control jurisdiction of the sector.

👉 **NOTE:** *Emphasize caution when using this function.*

## PAIRING (Continued)

---

### Review



### Response Item

A Manual Pairing Request may cause a code to be added to the Beacon Code View.

- A. True
- B. False



Radar Identification

[Click to Show Answer](#)

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**SLIDE ANSWER: A**

---

## PAIRING (Continued)

### Automatic Pairing on Discrete Beacon Aircraft

ERAM EDSM SRS  
210.04 V1B1,  
par. 3.2.2.3



### Automatic Pairing

- Automatic pairing on discrete beacon aircraft is available for:
  - Departures from adapted airports
  - Inbounds from another facility (if no handoff)
  - Airfiles, if a discrete code is assigned



Radar Identification

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 **NOTE:** Teach from graphic.



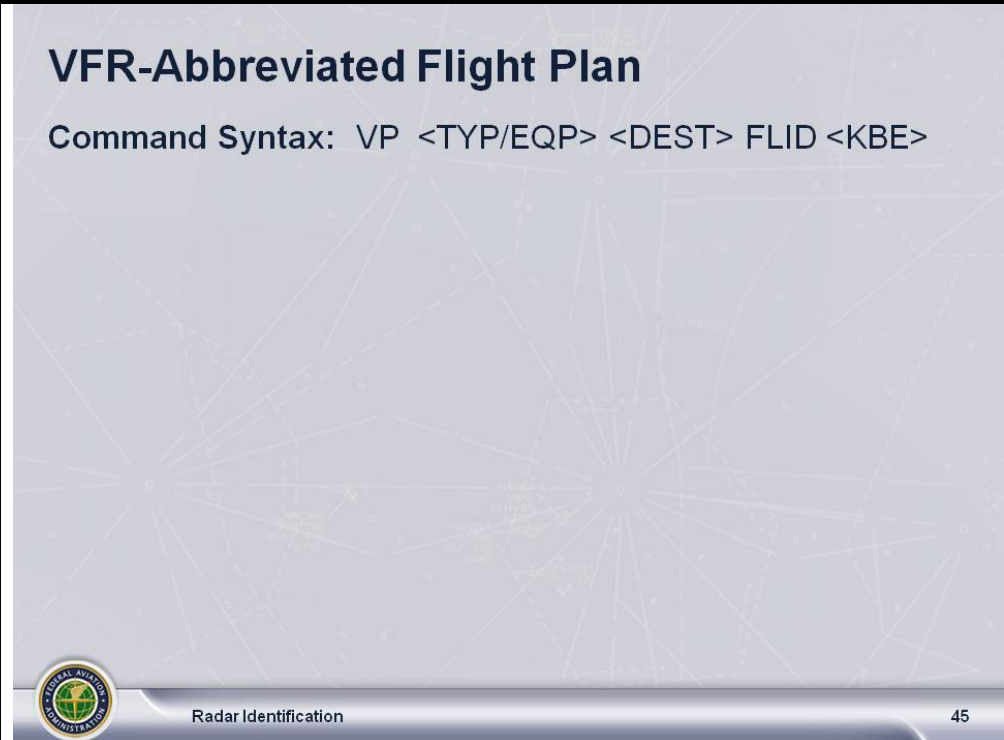
## PAIRING (Continued)


**VFR  
Abbreviated  
Flight Plan**  
ERAM EDSM SRS  
210.2 V1B2,  
Tables 22, 23,  
and 29



### VFR-Abbreviated Flight Plan

**Command Syntax:** VP <TYP/EQP> <DEST> FLID <KBE>





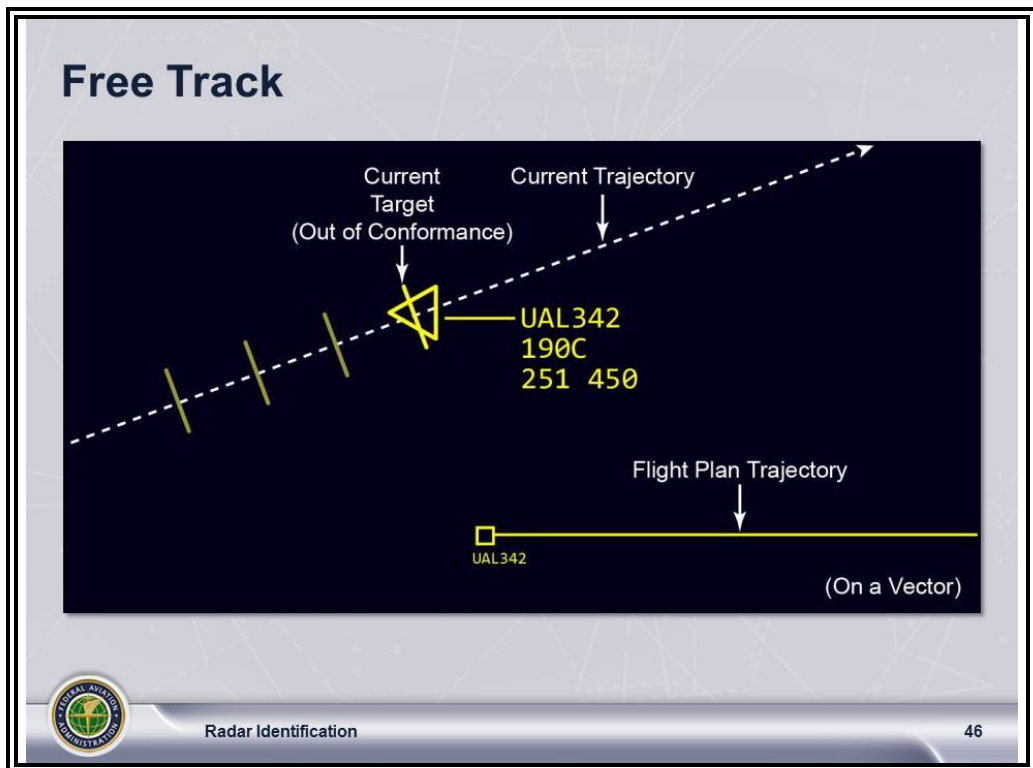
Radar Identification

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- ⊙ Flight plan entry for radar flight following to VFR aircraft
  - After the track has paired or a data block is placed on the Situation Display, enter the abbreviated flight plan:
    - Syntax: VP <TYP/EQP(Optional)> <DEST> FLID <KBE>
    - Flight ID can be:
      - Trackball entered over the position symbol, or
      - CID, or
      - AID
  - Route of flight may be entered in the message by including fixes only and separating them with periods.

# COMPUTER RADAR TRACKING

**Free Track**  
ERAM EDSM SRS  
210.04 V1B1

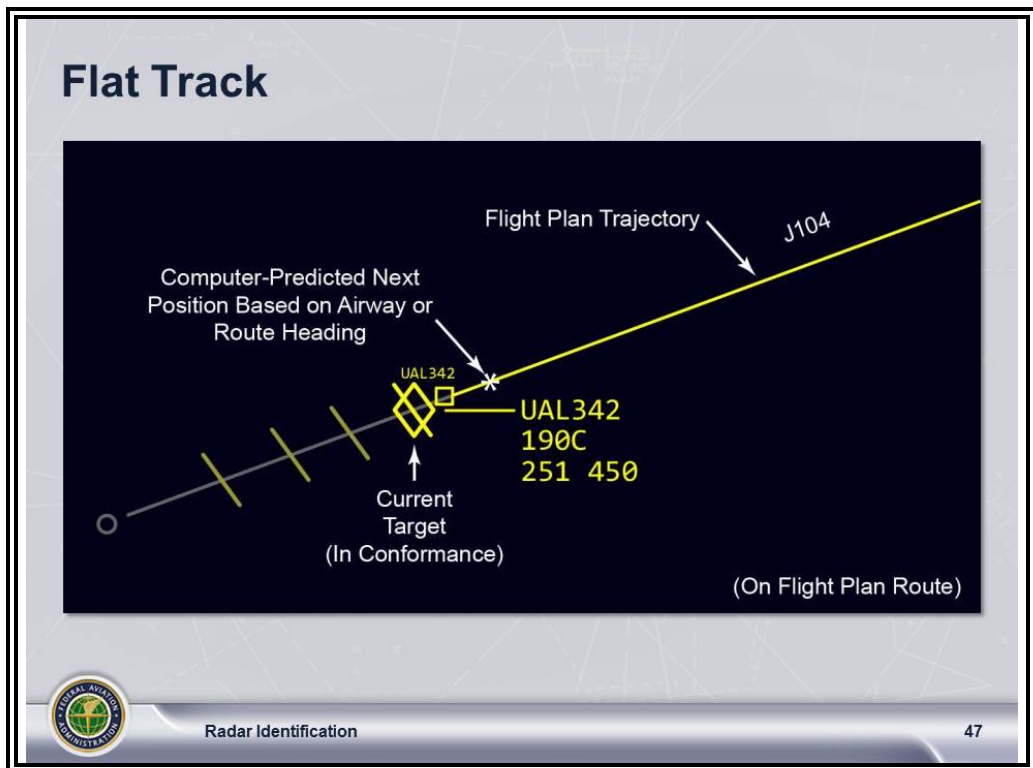


- ⦿ Data block is initially displayed oriented relative to initial direction of track based on radar data
- ⦿ Utilizes latest ground speed and heading information

👉 **NOTE:** Teach from graphic.

# COMPUTER RADAR TRACKING *(Continued)*

**FLAT Track**  
ERAM EDSM SRS  
210.04 V1B1,  
par. 3.2.2.3.2.1



- ⊙ Free Track process plus information from flight plan
- ⊙ Based on airway or route heading in flight plan

*Continued on next page*

# COMPUTER RADAR TRACKING *(Continued)*


## FLAT Track (Cont'd)

ERAM EDSM SRS  
210.04 V1B1,  
par. 3.2.2.3.2.1



### Flat Track Speed Calculation

$$\text{FILED TAS} \pm \text{UPPER WIND} = \text{PREDICTED GROUND SPEED}$$

Radar Identification48

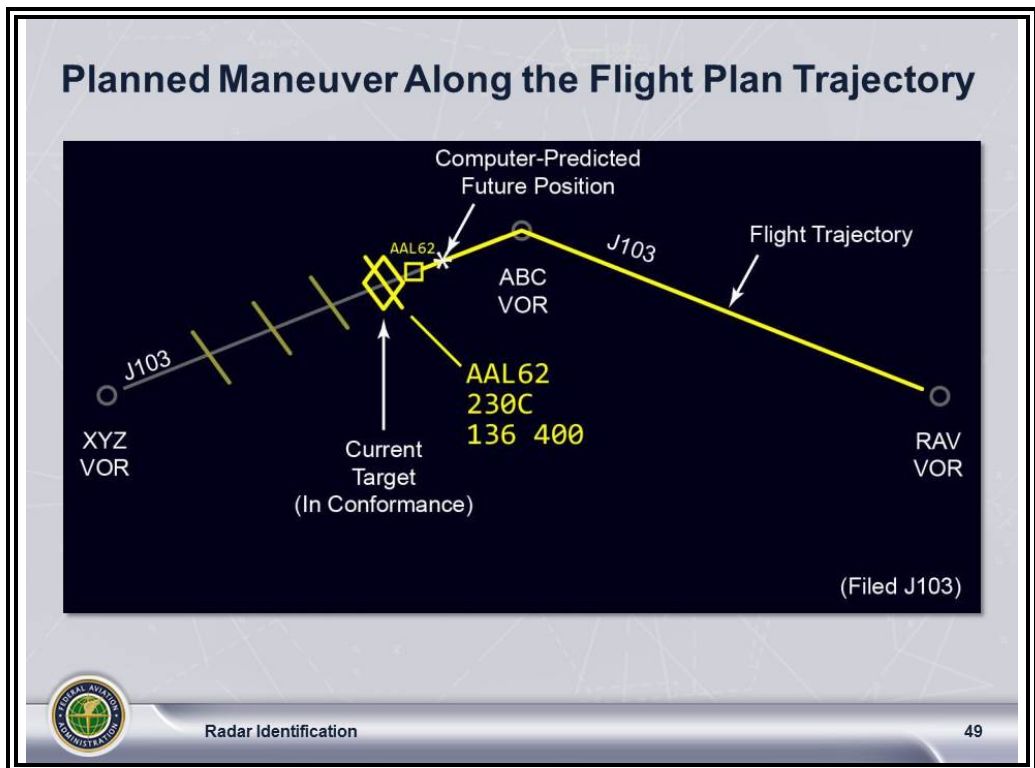
- ⊙ Speed must be consistent with flight plan speed.
  - Filed true airspeed (TAS) determines ground speed prediction.
  - Reported, or when unavailable, forecasted upper winds are taken into consideration.
- ⊙ Planned maneuvers
  - Prediction based on planned route changes

*Continued on next page*

# COMPUTER RADAR TRACKING *(Continued)*

## FLAT Track (Cont'd)

ERAM EDSM SRS  
210.04 V1B1,  
par. 3.2.2.3.2.1



☞ **NOTE:** Teach from graphic.

## COMPUTER RADAR TRACKING *(Continued)*

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### **Track**

### **Determination**

ERAM EDSM SRS  
210.04 V1B1,  
par. 3.2.2.3.2.1

- ⊙ Type of track is determined by computer.
    - FLAT Track is the first choice.
    - Lateral and longitudinal tolerances are adaptable locally.
  - ⊙ If aircraft is in lateral tolerance but out longitudinally, the computer will:
    - Calculate new flight plan position.
    - Issue updated times.
    - Remain in FLAT Track.
  - ⊙ If aircraft is out of lateral tolerance, the computer will change to Free Track until it returns within lateral tolerance.
  - ⊙ For vectors, weather deviations, and other changes in route of flight, you must enter an amended route for the aircraft to remain in FLAT Track.
  - ⊙ If the aircraft is obviously on a track that will cause it to deviate from its protected airspace:
    - Inform the pilot.
    - Assist in returning.
-

# COMPUTER RADAR TRACKING *(Continued)*

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## **Advantages of FLAT Track Over Free Track**

- ⊙ Advantages of FLAT Track include:
    - Auto handoffs
    - Auto position time updates
    - Coast tracking using Flight Plan (FP) data
    - More accurate track prediction
    - Forced FDB if handoff is not made
    - Conflict Probe more accurate
- 

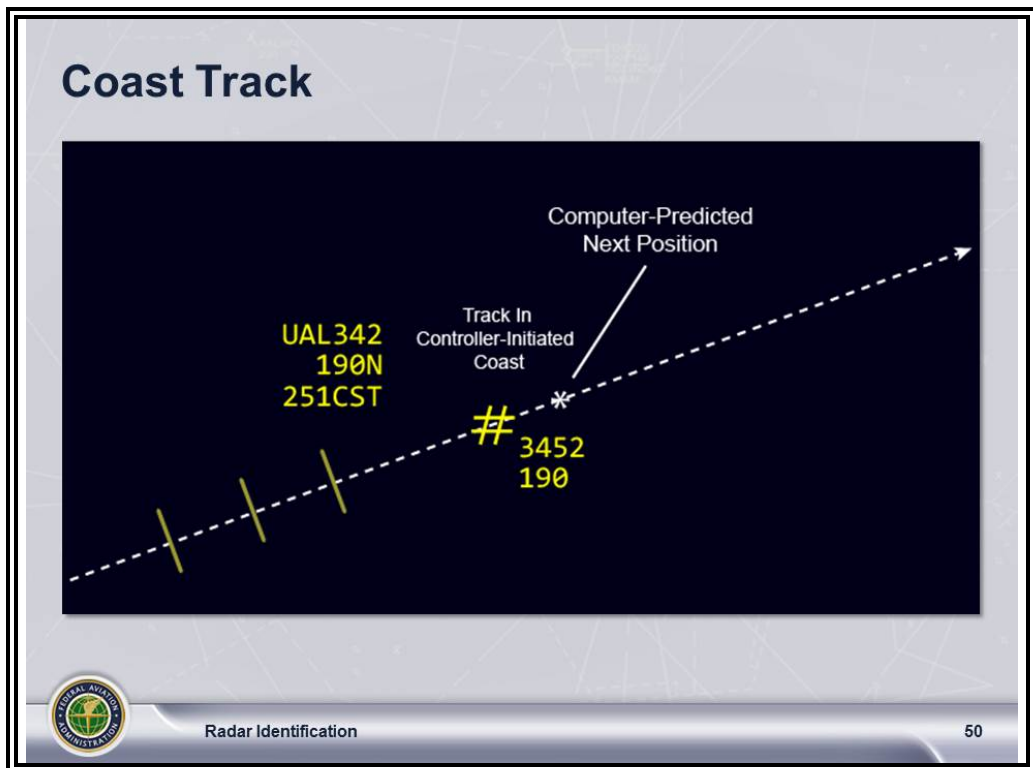
## **Typical Sequence of Events**

- ⊙ Track is started (FLAT).
  - ⊙ Track exceeds parameter limits (Free).
  - ⊙ Route amendment is entered (FLAT).
  - ⊙ Track deviates from route due to weather exceeding parameters (Free).
  - ⊙ Track returns to route (FLAT).
-

# COMPUTER RADAR TRACKING *(Continued)*

## Coast Track (CST)

TI 6110.100, 4.3.3;  
ERAM EDSM SRS  
210.04 V1B2,  
Section C.1  
and C.2



- ⊙ There are two types of coast tracks:
  - Controller-initiated, or Commanded Coast Track
  - Un-commanded Coast Track
- ⊙ Controller-initiated or Commanded Coast Track:
  - **From Flat Track** - The FDB with a Coast Track position symbol (#) will follow the cleared route at the current speed until the trajectory reaches the destination.
  - **From Free Track** – The FDB with a Coast Track position symbol (#) will continue to move on present heading at current speed indefinitely.
    - Optional fields include:
      - Heading
      - Speed
      - Primary track indicator
      - Positional information (Fix, FRD, trackball coordinates <TBP> or latitude/longitude)

*Continued on next page*



# COMPUTER RADAR TRACKING *(Continued)*

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## **Coast Track (CST)**

### **(Cont'd)**

TI 6110.100, 4.3.3;  
ERAM EDSM SRS  
210.04 V1B2,  
Section C.1  
and C.2

- If positional information is entered:
  - If your QT command was within tolerance, and no speed/heading entered, the FDB follows the FP at an offset distance equal to the distance from the route when you entered the command.
  - If your QT command was within tolerance, and you DID enter speed/heading, the FDB follows the controller-entered speed/heading.
  - If your QT command was NOT within tolerance, the FDB will follow the last known heading/speed.

**NOTE:** The tolerance above is the pending pairing adapted distance, defaulted to 32 NM and facility adaptable

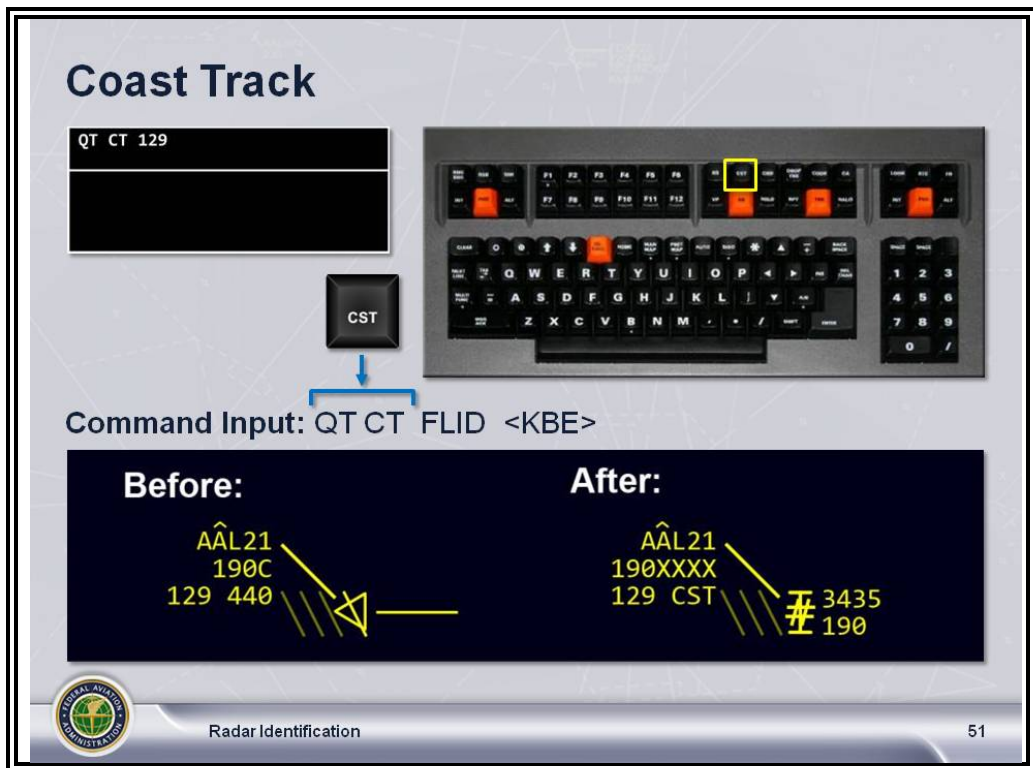
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# COMPUTER RADAR TRACKING *(Continued)*

## Coast Track (CST) (Cont'd)

TI 6110.100, 4.3.3;  
ERAM EDSM SRS  
210.04 V1B2,  
Section C.1  
and C.2



### ⊙ Un-Commanded Coast Track:

- Caused by a loss of surveillance information or by an un-pairing of the flight plan
- For an adapted period of time (15 - 60 seconds), the position of the FDB and track symbol, either flat or free, will be based on the track history.
- For an additional adapted period of time (15 – 60 seconds):
  - The track symbol will change to a Coast Track symbol (#).
  - CST will blink in Field E.
  - The position of the FDB and track symbol will continue to move.
  - At the end of this additional time, the FDB and track symbol will freeze in place.

*Continued on next page*

# COMPUTER RADAR TRACKING *(Continued)*

## Coast Track (Cont'd)

ERAM EDSM SRS  
210.04 V1B2,  
Section C.1  
and C.2



### Heading Format

- dd (ten-degree increments)
  - 04 = 40°
  - 27 = 270°
  - 36 = 360°
  - Aids computer in determining the direction of target movement

### Speed Format

- Sdd(d)(d)
  - Maximum speed allowed S3700
  - Aids computer in determining speed of target



Radar Identification

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☞ **NOTE:** Teach from graphic.

# TRACK COMMAND ENTRIES

**Remove Strip Command**  
ERAM MONF  
3.2.2.2.1.2.1;  
ERAM EDSM SRS  
210.04 V1B2,  
Section C1  
and C2




## Remove Strip

**QX FP 110**  
CONFIRM BY ENTERING Y  
REMOVE STRIP N753B/110


RS

Command Input: QX FP FLID <KBE>  
Second Command Input: Y <KBE>



**Before:**  
N753B  
170C  
110 430

**After:**  
I 3212  
170



Radar Identification

Click to Play Animation

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*Click to  
animate.*

- ⦿ The Remove Strip Command:
  - Removes the FDB
  - Unpairs the target and removes the FP from the computer; FP will gray-out on ACL
  - Deletes code from Beacon Code View
  - Sent to appropriate facilities/sectors

# TRACK COMMAND ENTRIES *(Continued)*

## Manual Unpair Command

ERAM MONF,  
3.2.2.2.1.2.1;  
ERAM EDSM SRS  
210.04 V1B2,  
Section C.1  
and C.2



### Manual Unpair


QX 110

DROP TRK

Command Input: QX FLID <KBE>

**Before:**  
N753B  
170C  
110 430

**After:**  
I 3212  
170

 Radar Identification 54

### ⦿ The Manual Unpair Command:

- Removes the FDB
- Unpairs
- Retains the FP in the computer (except tentative FPs)
- Deletes code from Beacon Code View

# RADAR FIX POSTING

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## Requirements

JO 7110.65,  
par. 5-1-11

- ⊙ Radar fix posting is required only when the flight progress recording components of the EAS FDP are **NOT** operational.
  - ⊙ For each controlled aircraft in the sector of responsibility, manually record the:
    - Aircraft's position at least once in each sector
    - Observed or reported time over a fix
-


# CONCLUSION

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## Summary

 **NOTE:** Review and elaborate briefly on the following:

- ⦿ Primary target identification methods and associated phraseology
- ⦿ Beacon target identification methods and associated phraseology
- ⦿ Questionable identification procedures
- ⦿ Target marker requirements
- ⦿ Radar fix posting requirements
- ⦿ Free and flat track symbols
- ⦿ Pairing commands (remove strip; manual unpairing request)

 **NOTE:** Ask students if there are any questions.

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## Practice Exercise

 **NOTE:**

- *The Practice Exercise is located in 55055-H08.*
  - *Content for the Practice Exercise is based on instruction given in lessons 55055-LP05 (Beacon Code Assignment), 55055-LP06 (Radar Identification) and 55055-LP08 (Radar Separation and Safety Alerts).*
  - *The student will complete this exercise at the end of lesson 55055-LP08.*
- 

## End-of-Lesson Test

- ⦿ Your instructor will now administer the End-of-Lesson Test.

 **NOTE:** Distribute and administer the End-of-Lesson Test located in 55055-ELT06.

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