NAVAL AIR TRAINING COMMAND

NAS CORPUS CHRISTI, TEXAS   **CNATRA P-493 (Rev 8-23)**

STUDENT GUIDE

GENESYS PFD/MFD
VNAV AVIONICS TRAINER
SELF-STUDY 4

TH-73A

2023

CNATRA P-493 (Rev 08-23)

Subj: STUDENT GUIDE, GENESYS PFD/MFD VNAV AVIONICS TRAINER
         SELF-STUDY 4

1. CNATRA P-493 (Rev 08-23) PAT, "Student Guide, Genesys PFD/MFD, VNAV Avionics Trainer Self-Study 4," is issued for information, standardization of instruction, and guidance to all flight instructors and student military aviators within the Naval Air Training Command.

2. This publication will be used as an explanatory aid to support the flight training curriculum. The procedures contained within this training are the standards for functions, manipulation, and setup of the Genesys PFD/MFDs.

3. Recommendations for changes shall be submitted via the electronic Training Change Request (TCR) form located on the Chief Naval Air Training (CNATRA) website.

4. CNATRA P-493 (New 10-22) PAT is hereby cancelled and superseded.

T. P. ATHERTON
By direction

Releasability and distribution:
This instruction is cleared for public release and is available electronically only via Chief of Naval Air Training Issuances Web site,
https://flankspeed.sharepoint-mil.us/sites/CPF-CNATRA/SitePages/Publications.aspx.

STUDENT GUIDE

FOR

TH-73A ADVANCED HELICOPTER TRAINING SYSTEM

GENESYS PFD/MFD

VNAV AVIONICS TRAINER

SELF-STUDY 4

TH-73A

TERMINAL LEARNING OBJECTIVE

Terminal Learning Objective (TLO):

Upon completion of this self-study, the SNA will be able to create and edit a VNAV flight plan.

HOW TO USE THIS STUDENT GUIDE

1. This self-study student guide is intended for use with the Part-Task Trainer (PTT) to improve your understanding of the Genesys displays and their functionality. The more you understand the Genesys menus before getting into the simulator or aircraft, the more you will be able to focus on improving basic air work and situational awareness during flight.

2. The Genesys software has several idiosyncrasies that can be frustrating if you have not interacted with the submenus. To familiarize yourself with the Genesys software, read and become familiar with the procedures in each chapter before getting into the simulator or aircraft.

3. While in the simulator, work through each scenario to perform the procedures detailed in the guide.

4. As you work through the steps of each procedure, develop a list of questions about anything that is unclear to you. This practice will allow you to ask questions at a later time with the instructor in a one-on-one setting.

LIST OF EFFECTIVE PAGES

Dates of issue for original and changed pages are:
Original (01 June 2022)
Revision …1…17 Aug 23

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 34 CONSISTING OF THE FOLLOWING:

Page No.	Change No.	Page No.	Change No.
COVER	0		
LETTER	0		
iii – ix	0		
x (blank)	0		
1-1 – 1-10	0		
2-1 – 2-4	0		
3-1 – 3-10	0		

INTERIM CHANGE SUMMARY

The following changes have been previously incorporated into this document.

CHANGE NUMBER	REMARKS/PURPOSE

The following interim Changes have been incorporated into this Change/Revision:

INTERIM CHANGE NUMBER	REMARKS/PURPOSE	ENTERED BY	DATE

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TABLE OF FIGURES

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CHAPTER ONE
GENESYS DISPLAY FUNCTIONALITY

100. INTRODUCTION

This chapter provides the steps required to display different types of information on the MFD display unit.

Upon completion of Chapter 1, you will have accomplished the following objectives:

- Display an Airport Diagram on the MFD for a particular airport.

- Set the Datalink weather display and view METAR and TAF information for a particular airport.

101. DISPLAY BUTTONS AND ENCODER KNOBS

Each Display Unit (DU) can be operated by the use of 4 encoder knobs (E1–E4) and 16 left and right display buttons (L1–L8 and R1–R8) indicated in **Figure 1-1**.

- The left and right display buttons are designated by the letters "L" and "R," respectively, and are numbered in sequence from top to bottom.

- The lower encoder knobs are designated by the letter "E" and numbered in sequence from right to left.

- **KNOB 4 (E4)** is only used for adjusting the screen and button brightness. It is always labeled **DIM**.
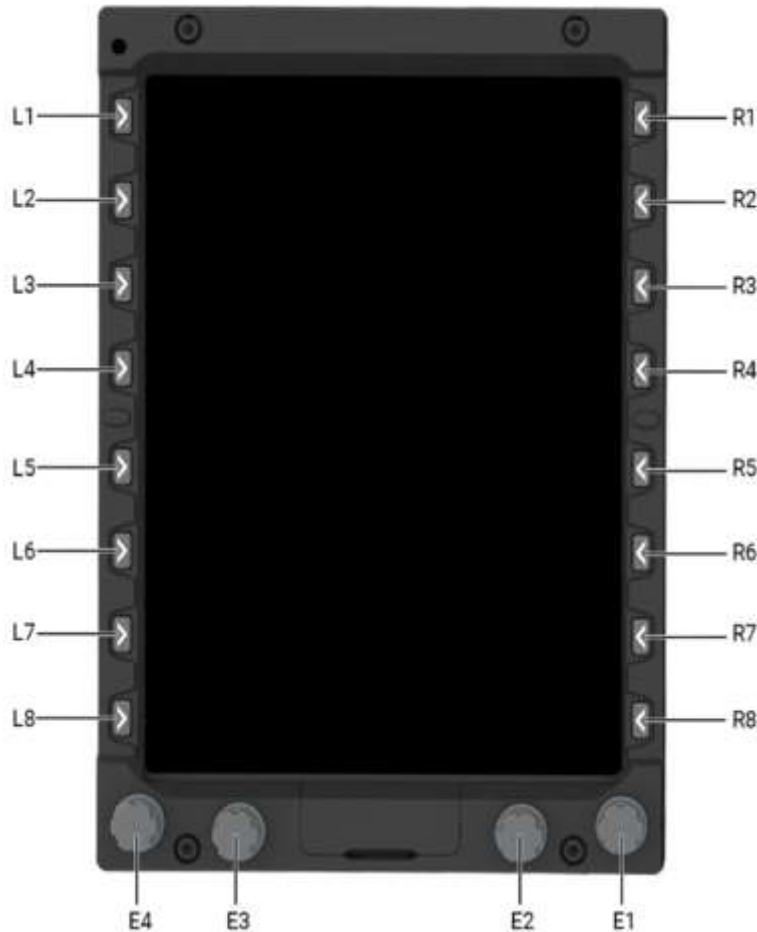
Figure 1-1 Display Buttons and Encoder Knobs

102. DISPLAY AN AIRPORT DIAGRAM

The Genesis software allows you to display a full-page airfield diagram (chart) of the nearest airport on the MFD if the chart has been loaded into the system and the screen is not in essential mode.

Airport diagrams and approach plates only reflect the current update cycle and do not account for any published NOTAM changes.

SCENARIO:
Display the Pensacola International Airport (KPNS) ILS Runway 17 airport diagram on the MFD.

<u>To display a diagram of the nearest airport</u>

1.   On the MFD, press **KNOB 1 (E1)** to access the display option menu (**Figure 1-2**).

Figure 1-2 MFD Display Option Menu

2.   Rotate **KNOB 1 (E1)** to highlight the **NRST APD** (Nearest Airport Diagram) option and press to display the diagram of the airport closest to your current position (**Figure 1-3**).

> **Note**: If you are trying to display the **NRST APD** of an airfield *other than* the airport closest to your current position, you need to "trick" the system by loading an instrument approach procedure for that airport in the active flight plan, then select the now-available IAP APD (Instrument Approach Procedure Airport Diagram) menu option. Since you have loaded an IAP that you do not intend to complete, great care must be taken when doing this – and when reverting from it – to avoid loss of situational awareness.
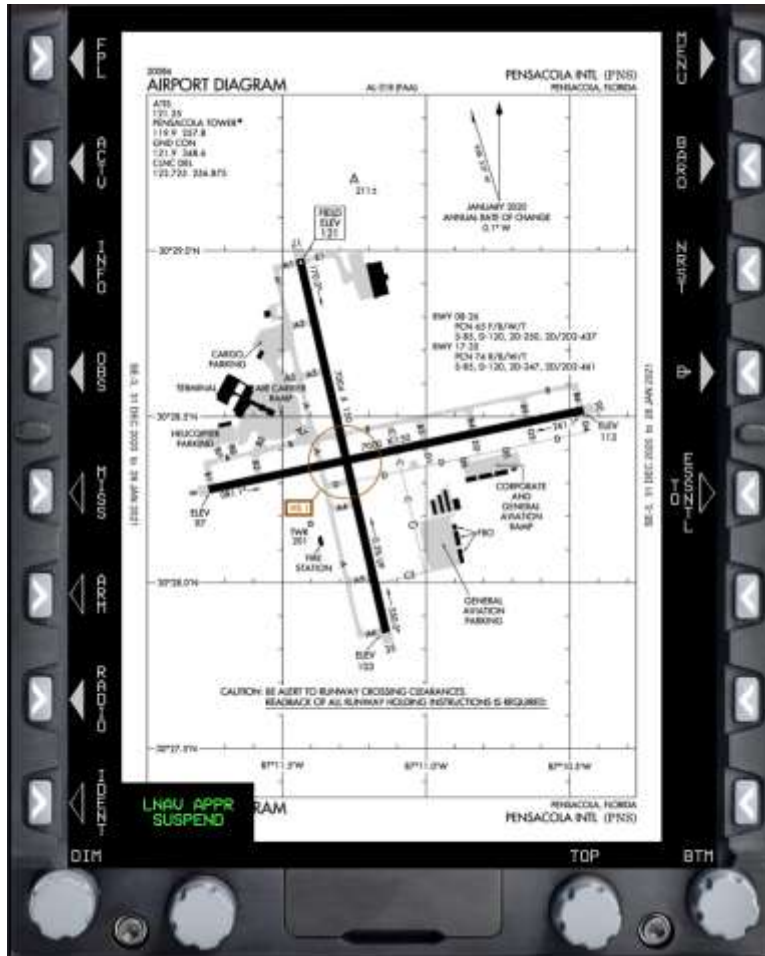
Figure 1-3 KPNS Airport Diagram on the MFD

103. DISPLAY WEATHER INFORMATION

There are several in-flight sources of weather available using the Genesys software and Flight Information Services-Broadcast (FIS-B) data.

> **Note**: The steps in this next section are representative of the actual aircraft, but the trainer and simulator devices do not *currently* display weather information without it first being manually loaded. Familiarity with the Genesys functionality and capability is the goal, even if the devices may not fully display the same information.

SCENARIO:
You are flying to KPNS and want to check the weather at that airport.

To display the Datalink option on the bottom of the MFD:

1.   On the MFD, press **KNOB 1 (E1)** to open the display option menu.

2.   Rotate **KNOB 1 (E1)** to highlight the DATALINK option (**Figure 1-4**) and press to display the local weather on the bottom of the MFD.
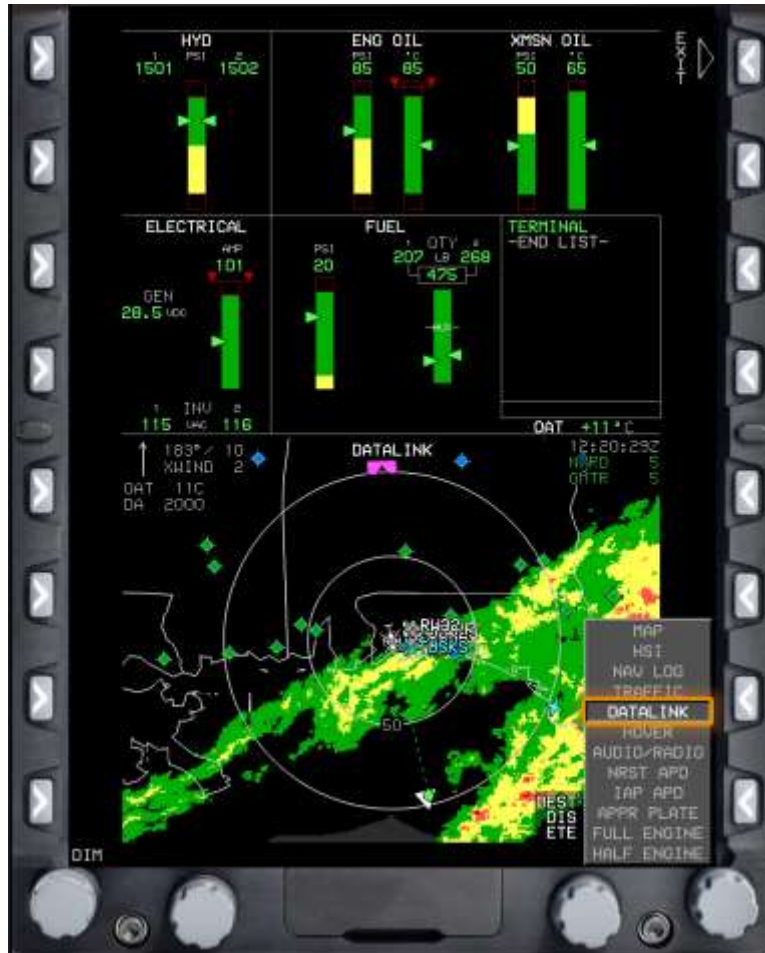
Figure 1-4 Datalink Displayed on the MFD

3.   Press the **MENU (R1)** button to display additional menu levels.

4.   Within 10 seconds, press the **FORMAT (R8)** button to display the Datalink menu.

5.   Rotate **KNOB 1 (E1)** to highlight the **PAN ON** option and press to select.

–   The **NORTH (L7)**, **SOUTH (L8)**, **EAST (R7)**, and **WEST (R8)** buttons display (**Figure 1-5**) to allow you to move the center point of the radar map.
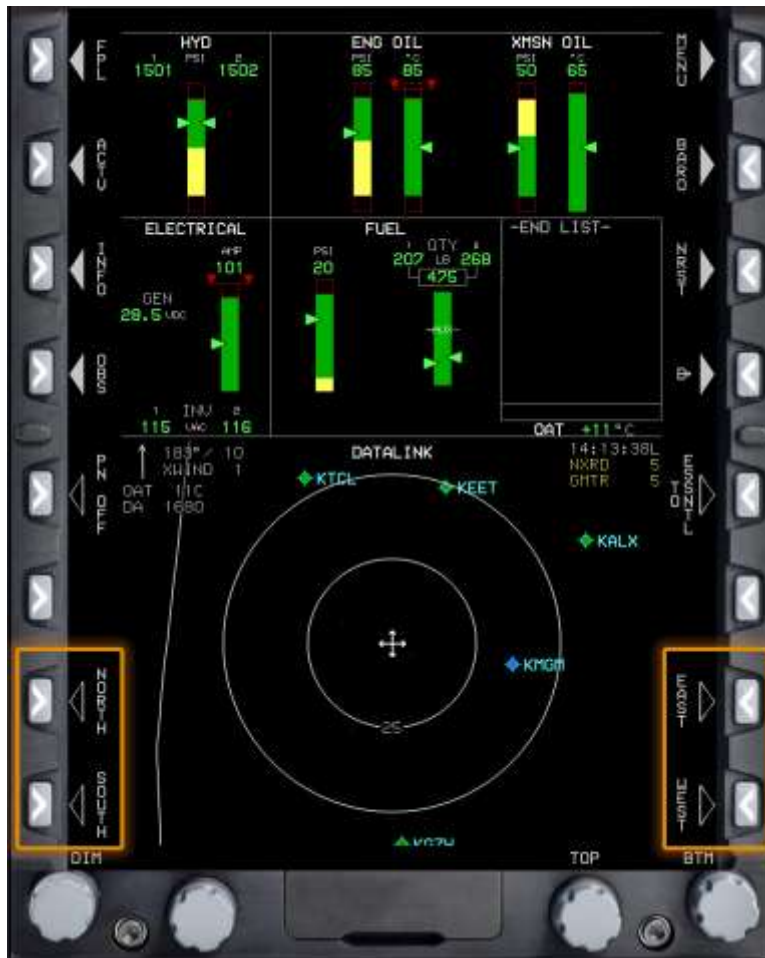
Figure 1-5 Map Panning Buttons

6.   Press the **MENU (R1)** button to display additional menu levels.

7.   Press the **FORMAT (R8)** button within 10 seconds to display the Datalink menu

8.   Rotate **KNOB 1 (E1)** to highlight the **DCLTR** (Declutter) option and press to display the sub-menu.

9.   Rotate **KNOB 1 (E1)** to highlight a menu option (**ROUTE**, **G METAR**, or **NEXRAD**) and press to select. Multiple options can be selected.

   −   A check mark displays to confirm the selection and the data displays on the bottom of the MFD.

10.   Press the **EXIT (R1)** button to close the menu.

1-6   GENESYS DISPLAY FUNCTIONALITY

To display the weather at an airport:

1.   Press the **INFO (L3)** button.

2.   Rotate **KNOB 1 (E1)** to scroll to the letter or number of the desired waypoint identifier and press to select the option. Repeat this step to select the next letter or number of the waypoint identifier.

        −   After selecting the first two letters, the **SEARCH (R4)** button is active.

3.   Press the **SEARCH (R4)** button to display a list of filtered airports beginning with the entered identifiers (**Figure 1-6**).

Figure 1-6 Airport Search Results on MFD

4.   Rotate **KNOB 1 (E1)** to highlight an airport and press to display the airport information at the bottom right of the MFD (**Figure 1-7**).

Figure 1-7 Airport Information for KPNS on the MFD

5.   Press the **WX LGND (L2)** (Weather Legend) button to display the color and symbol key (**Figure 1-8**).

6.   Press the **Back (R1)** button to return to the airport information page.

Figure 1-8 WX LGND Color Key on MFD

7.   Press the **EXPND WX (L3)** (Expand Weather) button to display the airport's Meteorological Aerodrome Report (METAR) and/or Terminal Aerodrome Forecast (TAF) text (**Figure 1-**9).

Figure 1-9 Expanded Airport METAR/TAF Text on MFD

8.   Press the **EXIT (R1)** button to close the weather text.

CHAPTER TWO
USER WAYPOINTS

200. INTRODUCTION

This chapter provides the steps required to create and edit waypoints that have not already been loaded in the system. User waypoints are created by users and can be identified by a blue "U" surrounded by a blue box. The system can store a maximum of 998 user waypoints.

Upon completion of Chapter 2, you will have accomplished the following objectives:

- Create a User Waypoint in a flight plan.

- Edit a User Waypoint in a flight plan.

201. CREATE A USER WAYPOINT

Waypoints can be created using the latitude and longitude of a location or radial and distance.

> **SCENARIO:**
> Create a user waypoint for Bear Lake using N30°51′44″ W086°49′46″ and a user waypoint off of the Crestview VORTAC at the 240 radial at 15 NM.

To create a USER WPT (Waypoint) using latitude and longitude:

1. Press the **FPL (L1)** (Flight Plan) button.

2. Rotate **KNOB 1 (E1)** to highlight the **CREATE-EDIT** menu option and press to select.

3. Rotate **KNOB 1 (E1)** to highlight the **CREATE USER WPT (LAT-LONG)** menu option and press to select.

4. Name the user waypoint up to five characters. Rotate **KNOB 1 (E1)** to display a letter or number and press to select. Spaces and duplicate names are not allowed.

5. If you are creating a user waypoint for the current aircraft position, press the **SAVE (R7)** button or **Direct-to** (R8); otherwise, rotate **KNOB 1 (E1)** to edit the letters/numbers in each latitude and longitude position and press to proceed to the next position (**Figure 2-1**).

Figure 2-1 User Waypoint Latitude and Longitude Information

6.   Press **KNOB 1 (E1)** to advance to the next field.

7.   Rotate **KNOB 1 (E1)** to edit the approach bearing to the user waypoint in degrees, 1–360, if necessary.

    −   The approach bearing preloads depending on the mode of flight. On the ground, it preloads with the current heading. In flight, it preloads with OFF value. OFF disables VFR approaches to the user waypoint so you should add an approach bearing if a VFR approach is desired.

8.   Press **SAVE (R7)** to save the waypoint to the system.

To create a user waypoint using radial and distance:

1.   Press the **FPL (L1)** button.

2.   Rotate **KNOB 1 (E1)** to highlight **CREATE-EDIT** and press to select.

2-2   **USER WAYPOINTS**

3.   Rotate **KNOB 1 (E1)** to highlight **CREATE USER WPT (RAD-DST)** and press to select.

  −   The system automatically names the waypoint with the sequential number available
       after other user waypoints. For example, if RD001 already exists, it will fill in
       RD002.

4.   Press **KNOB 1 (E1)** to proceed to the second line.

5.   Rotate **KNOB 1 (E1)** to highlight the reference point once it is available.

6.   Enter the radial and distance information (**Figure 2-2**).

Figure 2-2 User Waypoint Radial and Distance Information

7.   Press **SAVE (R7)** to save the waypoint to the system.

8.   Press the **EXIT (R1)** button to close the flight plan menu.

202. EDIT A USER WAYPOINT

To edit a user waypoint:

1.   Press the **FPL (L1)** button.

2.   Rotate **KNOB 1 (E1)** to highlight **CREATE-EDIT** and press to select.

3.   Rotate **KNOB 1 (E1)** to highlight **EDIT USER WPT** and press to select.

4.   Rotate **KNOB 1 (E1)** to highlight the user waypoint to edit and press to select.

5.   Edit the name, location information, etc.

6.   Press **SAVE (R7)** to begin navigation guidance.

CHAPTER THREE
VNAV FLIGHT PLAN

300. INTRODUCTION

This chapter provides the steps required to load and edit a Visual Navigation (VNAV) flight plan.

Upon completion of Chapter 3, you will have accomplished the following objectives:

- Create and load a VNAV flight plan.

- Add a VFR approach to an activated flight plan.

- Edit a flight plan using the Flight Plan (FPL) and Active flight plan (ACTV) pages.

301. CREATE AND LOAD A FLIGHT PLAN

SCENARIO:
Load the following VNAV flight plan from Birmingham-Shuttlesworth International Airport (KBHM) to Lovell Field (KCHA) in Chattanooga, Tennessee, using small airports and other visual features along the way to navigate (**Figure 3-**1).

- Create Waypoint Railroad Bridge (N34°57′13″ W085°42′12″) with user waypoint name RRBDG

- KBHM

- Robbins Field (20A)

- Gunthersville Municipal Airport (8A1)

- Scottsboro Municipal Airport (4A6)

- Railroad Bridge (RRBDG)

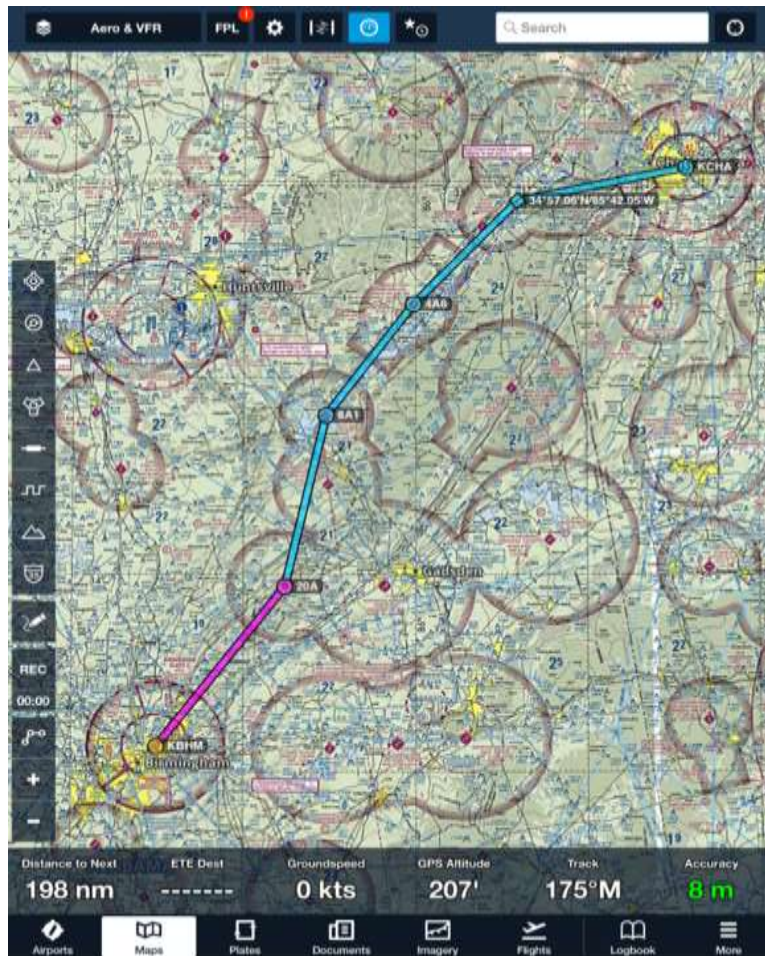- Marion County/Brown Field (KAPT)

- KCHA

Figure 3-1 VNAV Route KBHM to KCHA in ForeFlight

To create a new flight plan:

1.   On the MFD, press the **FPL (L1)** button.

2.   Press **KNOB 1 (E1)** to select the **CREATE-EDIT** menu option.

    −   The CREATE FLIGHT PLAN menu displays.

3.   Press **KNOB 1 (E1)** to start a new flight plan.

To add a waypoint to a flight plan using the NRST APT (Nearest Airport) function:

1.   Press the **ADD (R6)** button to add the first waypoint.

2.   Press the **NRST APT (L6)** button to display a list of the nearest airports from the last waypoint in the flight plan, or if there are no waypoints in the flight plan yet, then **L6** will display a list of the nearest airports from the aircraft's current location.

3-2   **VNAV FLIGHT PLAN**

3.   Press **KNOB 1 (E1)** to add the first airport on the list.

    −   If the desired airport is not at the top of the list, rotate **KNOB 1 (E1)** to highlight the correct airfield.

To add a waypoint to a flight plan using the SEARCH function:

1.   Press the **ADD (R6)** button.

2.   Rotate **KNOB 1 (E1)** to highlight the letter or number of the desired waypoint identifier and press to select the option. Repeat this step to select the next letter or number of the waypoint identifier.

    −   After selecting the first two letters, the **SEARCH (R4)** button is active.

3.   Press the **SEARCH (R4)** button to display a list of waypoints beginning with the selected letters or numbers.

4.   Rotate **KNOB 1 (E1)** to scroll through the list of waypoints.

5.   Press **KNOB 1 (E1)** to add the highlighted waypoint to the flight plan.

6.   Continue adding waypoints to the flight plan, as required (see example in **Figure 3-2**).

Figure 3-2 Example of Flight Plan on MFD

To save and activate a flight plan:

1.   Press the **SAVE (R8)** button.

2.   Rotate **KNOB 1 (E1)** to the **ACTIVATE FLIGHT PLAN** menu option and press to display a list of saved flight plans.

    −   The flight plans are listed by departure and destination waypoints (usually airports).

3.   Rotate **KNOB 1 (E1)** to highlight the flight plan to be activated and press to select.

    −   The flight plan displays on the map.

4.   Press the **EXIT (R1)** button to close the flight plan menu.

3-4   **VNAV FLIGHT PLAN**

302. ADD A VFR APPROACH

SCENARIO:

Add a VFR approach to an activated flight plan at Lovell Field (KCHA) using Runway 15.

To add a VFR approach to a flight plan:

The Genesys software allows you to load a VFR approach to provide navigational guidance to a selected runway. This function may be useful when operating at an unfamiliar airfield and you want to visualize an extended runway centerline or autopilot to fly to the runway in use.

1.   Press the **ACTV (L2)** (Active) button.

2.   Rotate **KNOB 1 (E1)** to highlight the chosen airport and press to select.

3.   Rotate **KNOB 1 (E1)** to highlight **VFR APPR** (Approach) (**Figure 3-3**) and press to select.

Figure 3-3 VFR APPR on the Flight Plan Menu

4.   Rotate **KNOB 1 (E1)** to highlight the chosen runway and press to add the approach to the flight plan (**Figure 3-4**).

Figure 3-4 Approach Added to a Flight Plan

303. EDIT A FLIGHT PLAN

It is possible to add and delete waypoints in a flight plan two ways:

1.   Flight Plan (FPL) page using EDIT FLIGHT PLAN

2.   Active flight plan (ACTV) page using the INSERT and DELETE soft keys

SCENARIO:

You are flying the route with the Instructor and you notice some heavy rain from a pop-up thunderstorm as you approach 8A1. Your Instructor decides to change the route to avoid weather (**Figure 3-5**):

- Approach KCHA from the south instead of the west.

- Delete 4A6, Railroad Bridge, and KAPT from the active flight plan.

- Add Isbell Field (4A9), Barwick Lafayette Airport (9A5), and CHOO CHOO VORTAC (GQO)—in that order—prior to KCHA.
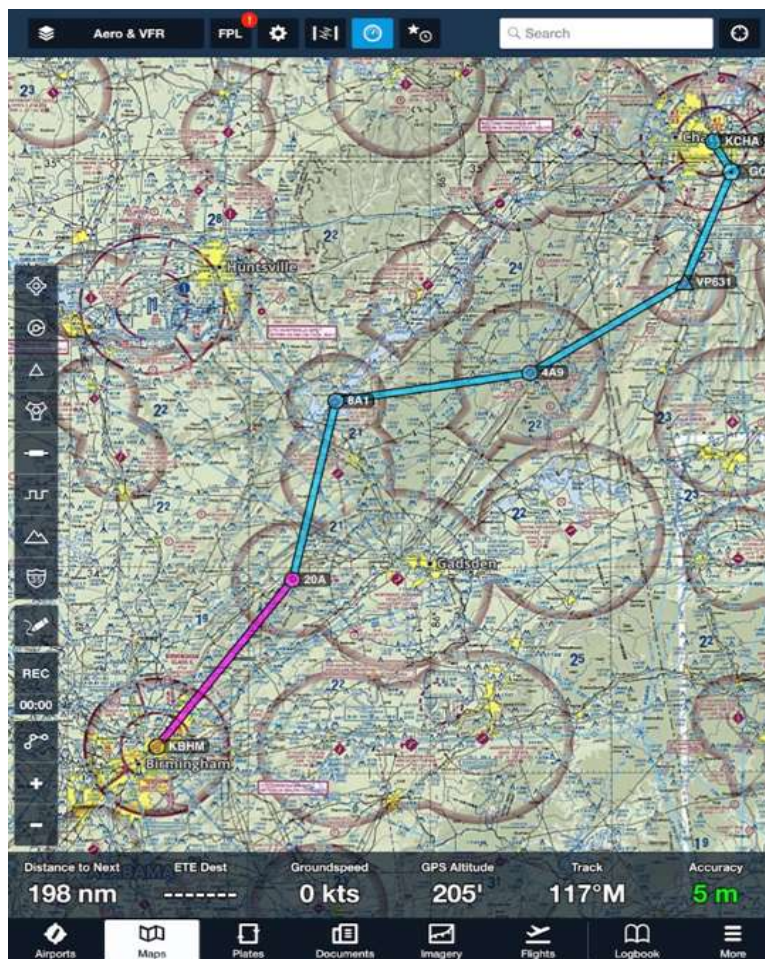

Figure 3-5 Edited Route to KCHA in ForeFlight

To delete a waypoint from a flight plan:

1. Press the **FPL (L1)** button.
2. Select **CREATE EDIT** and press **KNOB 1 (E1).**

3.   Rotate **KNOB 1 (E1)** to highlight **EDIT FLIGHT PLAN**. Press to select.

4.   Rotate **KNOB 1 (E1)** to the appropriate flight plan. Press to select.

5.   Rotate **KNOB 1 (E1)** to the waypoint. Press the **DELETE (R7)** button. The CONFIRM DEL WPT (Delete Waypoint) prompt will appear.

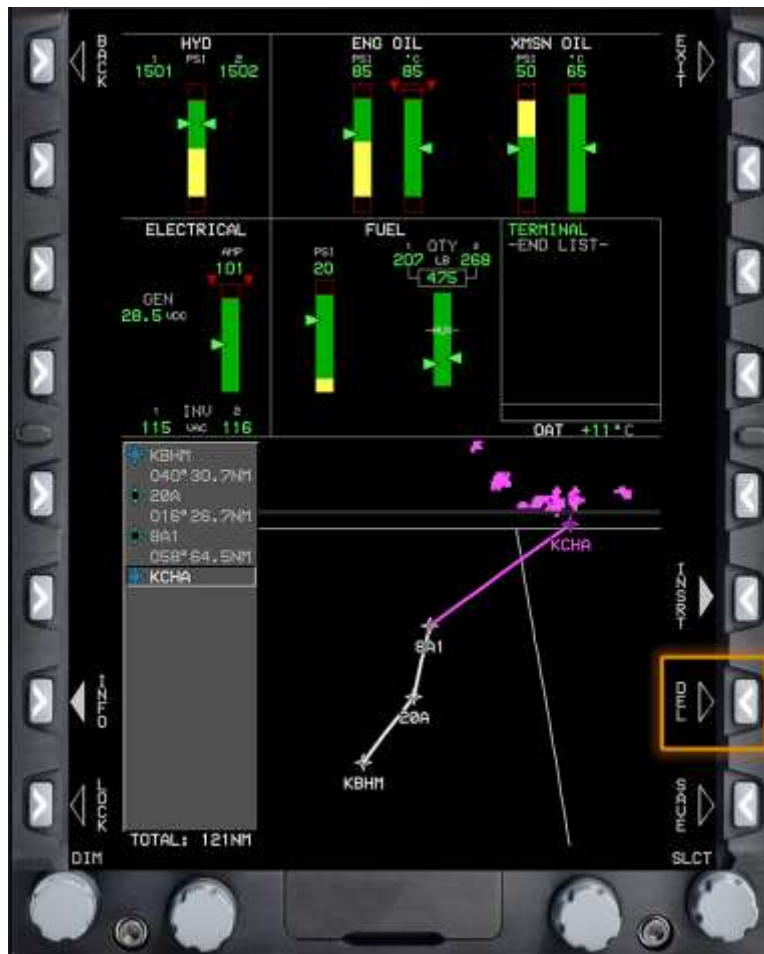6.   Press **KNOB 1 (E1)** to delete the waypoint.

Figure 3-6 Delete Option on Flight Plan

−   Repeat Steps 4 and 5, as needed.

7.   Press the **SAVE (R8)** button to save the changes.

To add a waypoint to the active flight plan using the ACTV menu:

1. On the MFD, press the **ACTV (L2)** button (**Figure 3-7**).

Figure 3-7 ACTV Menu

2.   Rotate **KNOB 1 (E1)** to highlight the location the waypoint is to be added. The waypoint will be inserted above the highlighted waypoint.

3.   Press the **INSERT (R2)** button.

4.   Press the **NRST APT (L2)**, **NRST VOR (L3)**, **NRST NDB (L4)**, **NRST FIX (R2)**, **NRST USR (R3)**, or **AIRWAY (R4)** soft key for the type of waypoint to be added.

   −   If the waypoint is not available in the nearest list, use **KNOB 1 (E1)** to enter the waypoint identifier using the **SEARCH (R4)** function. You need to input at least two characters, but at least three or four characters will make it easier to find the waypoint. Select the desired waypoint from the list of 20.

5.   Press **KNOB 1 (E1)** to add the first waypoint to the flight plan.

–   If the waypoint is not at the top of the list, rotate **KNOB 1 (E1)** to highlight the correct airfield.

6.   Repeat Steps 4 and 5 for additional waypoints.

7.   Press the **SAVE (L1)** button to save the edited flight plan. If you do not want to change the saved flight plan, press **EXIT (R1)**.

–   When you change an active flight plan, there will be an option to save the modified flight plan. Saving the modified flight plan is not recommended unless the pilot needs both the original and the modified flight plan. Saving each modification of an active flight plan will create multiple flight plans.

–   If the new flight plan has the same departure and arrival airports as one already saved in the flight plan list, it will be denoted with a (1), (2), etc. in the list of flight plans, such as KNDZ-KCEW (1).