Miltech Simulations MH60

Keyset

Caution

Brief pauses of approx. 300ms when switching pages are normal and intentional, as the system refreshes all individual displays during each page change. This ensures the pages are fully refreshed before interactable.

- To optimize performance, only the **Pilot-side Keyset** is functional. The **Copilot-side Keyset** is modeled visually but does not execute any code. CPLT Side Keyset may be enabled in the future, depending on the stability of the systems across multiple platforms.

The Keyset is the primary interface used to interact with the Communication, Navigation, Mission and Weapons Management Systems onboard the MH60. It also provides submenus to configure the aircraft's cabin layout, equipment loadout, and other mission-specific settings.

The layout and functionality of the Keyset are designed to replicate real-world multi-function keypads found in this family of military rotorcraft. The Keyset has, however, been adapted and simplified for the simulation environment.

Modern MH60 Blocks (Block II onwards) utilize FMCs instead of the Keyset. These FMCs are, however, fully undocumented and classified due to the sensitivity of the aircraft. There is extensive publicly available documentation on the Keyset systems, as it has been phased out by most operators.

Keyset Overview and Distribution



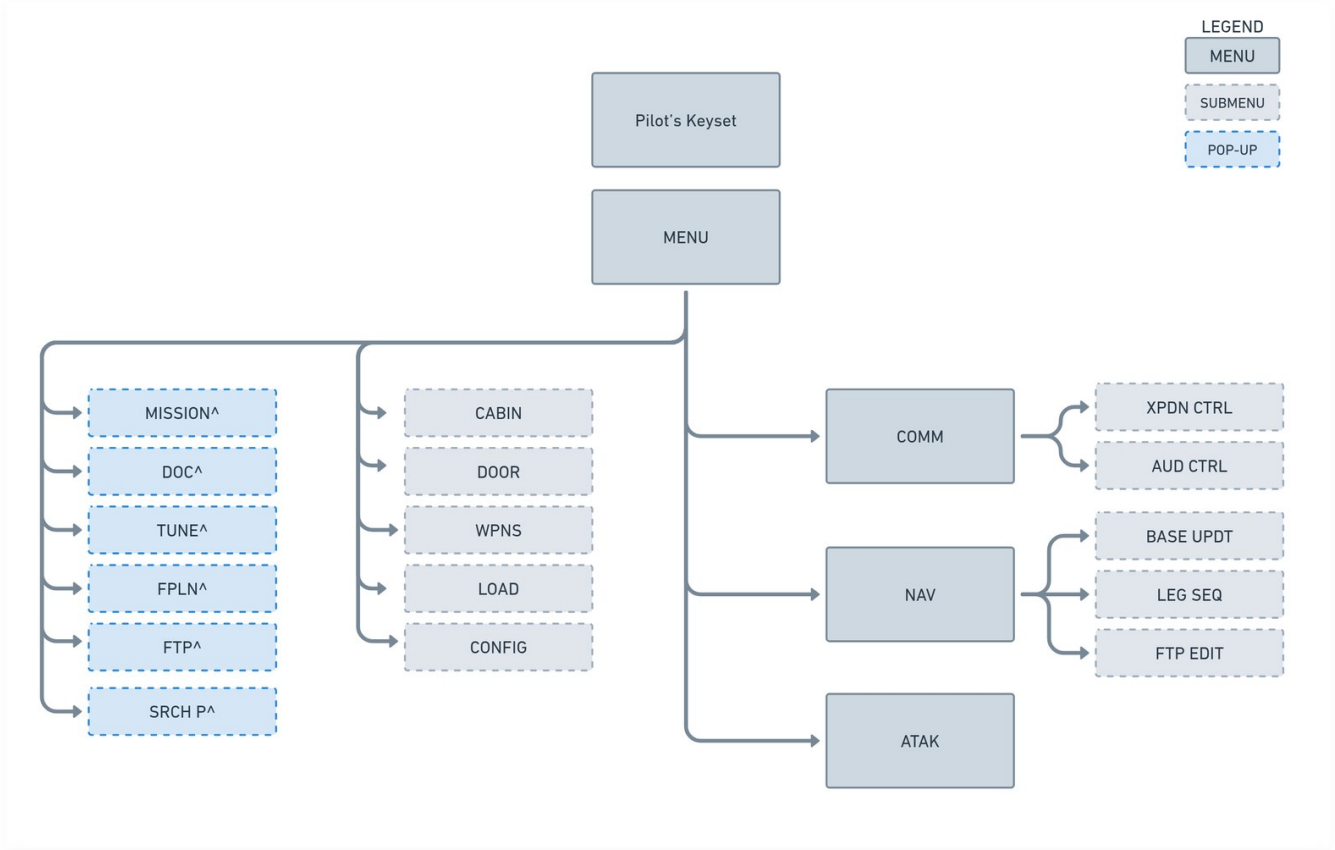
1. **Programmable Key Area (PK):** The PK area provides control keys all the major Keyset menu modes. This area consists of a 4 x 8 matrix of 32 keys and displays. There are three type of events that could occur when a key is depressed:
2. On-Screen Table and Menus: Some keys may result in the display of a pop-up screen on the MD or PFD. Primary window tables are used when large amounts of information must be displayed. These tables are generally interactable using the keyset keys. These are displayed with an upwards-pointing arrow (^) when the Pop-up Menu is displayed (eg. DOCS^). DOCS, MISSION, TUNE, FPLN, FTP and SRCH P are Pop-up Menus.
3. Menu Navigation: Some keys may result in the navigation from one menu to the other, or from a menu to a sub-menu within the keyset hierarchy.
1. Menus: Full page change, generally with Sub-menus and a "RTN" button on the lower-right display. COMM, NAV, and ATAK are full menus. RTN will always trigger a return to the main MENU.

2. Submenus: Partial or full page change, contained within a Menu. Generally found under MENU, COMM and NAV, for specific functions like: LOAD, WPNS, BASE UPDT, XPND CTRL, etc.

4. Immediate action or toggle on/off. When depression of a PK results in the activation of a toggle\ on/off key function, asterisks (* *) appear until the key is depressed again/function is deactivated.

Refer to Keyset Hierarchy Diagram for more information. 2. ▣ **ENTER (ENT) Button:** Enters information where appropriate (eg. on input fields). It also functions as quick XFER Button anytime the TUNE Page is active. 3. **Numeric Keypad:** Enters numbers 0-9 where appropriate (eg. on input fields). Note that keys 2, 4, 6 and 8 also correspond to North, West, East and South, respectively, for coordinate input fields. 4. **Erase Functions (CLR MENU, ERAS SYMB):** CLR MENU Erases entire string of text or numbers from memory. ERAS SYMB Erases the latest inputted character or number. 5. **TUNE Shortcut:** Opens the TUNE Pop-up menu on MD, from where the user may tune the radios and navigation aids by channel and/or frequency. 6. ▣ **ACKNOWLEDGE (ACK) Button:** Acknowledges an action when appropriate - think of it as a "Click" button. Often interchangeable with SEL. Can also be accessed from the MD Bezel (ACK Button). 7. **FLY-TO-POINT (FTP) Shortcut:** Opens the FTP Pop-up menu on MD, which allows the operator to generate, edit, and review FTPs. 8. ▣ **IDENT Button:** Transmits (20 seconds) an IFF transponder-coded response to an interrogation issued by a civilian air traffic controller. 9. **COMMUNICATIONS (COMM) Shortcut:** Displays COMM mode menu, which permits manipulation of the communications system. 10. **NAVIGATION (NAV) Shortcut:** Displays NAV mode menu, which permits manipulation of the navigation system. 11. **ATTACK (ATAK) Shortcut:** Displays ATTACK mode menu, which permits manipulation of the attack and weapons system. ATAK is not available on MH60T. 12. **MENU Shortcut:** Displays the main keyset Menu. 13. **Range Up/Range Down:** Manipulates the Map Range Scale, regardless of MD Page currently selected. Range can also be manipulated with PG UP or PG DN from the MD Bezel or Keyset, but only when selected page is MAP, PLAN or TACT, and no other Pop-up is displayed on MD. 14. **Arrow Keypad:** Equivalent to PG UP, PG DN, PG LEFT, PG RIGHT functions of MD Bezel. Moves selector up/down/left/right accordingly. Used primarily with conjunction of MD Pop-up and pages for navigation. Tabulation keys are not functional. 15. ▣ **SELECT (SEL) Button:** Selects an action when appropriate - think of it as a "Click" button. Often interchangeable with ACK.

Keyset Hierarchy Diagram



Find here the Menu/Submenu hierarchy of the Pilot's Keyset. Please note that this hierarchy has been adapted and simplified for simulator use, based on real aircraft NATOPS Manuals. The real aircraft has several more pages that are not applicable to MSFS or the scope of this project.

Keyset Submenus and Functions

(1) Main Menu

Initial point of entry of the Keyset. Provides easy access to all other menus (COMM, NAV, ATAK), Pop-Ups, as well as access to the various fictional "Aircraft Configuration" submenus.

This page does not exist on the real aircraft. It has been added for ease of navigation on a simulation environment, as well as means to configure the aircraft. It has 5 directly dependent Submenus:

- CABIN
- DOOR
- WPNS
- LOAD
- CONFIG

For more information and details on each of these pages: Main Menu (MENU)

Additionally, various Mission Display (MD) Pop-ups can be enabled from here. For more information: MD Popups

(2) Communications Menu (COMM)

The Communications Menu permits manipulation of the communications system. From here, users may switch transponder modes, tune in frequencies, XFER Frequencies, deactivate the Virtual Crew Chief, among other functions.

For more information and details on this menu: Communications Menu (COMM)

(3) Navigation Menu (NAV)

The Navigation Menu permits manipulation of the navigation system. From here, users may tune in Nav Frequencies, change TACAN Mode, modify Base coordinates, modify FTP Flightplans, and import flightplans over-the-cloud from INSPlanner.

For more information and details on this menu: Navigation Menu (NAV)

(4) Attack Menu (ATAK)

The Attack Menu permits manipulation of the attack and weapons system. ATAK is not available on MH60T. From here, users may configure the weapon pylons and arm Hellfires/torpedos for launch.

For more information and details on this menu: Attack Menu (ATAK)

Keyset Functions and Tasks

The Keyset is designed to be a multi-functional interface and a central control point for a wide range of mission-related tasks. These include:

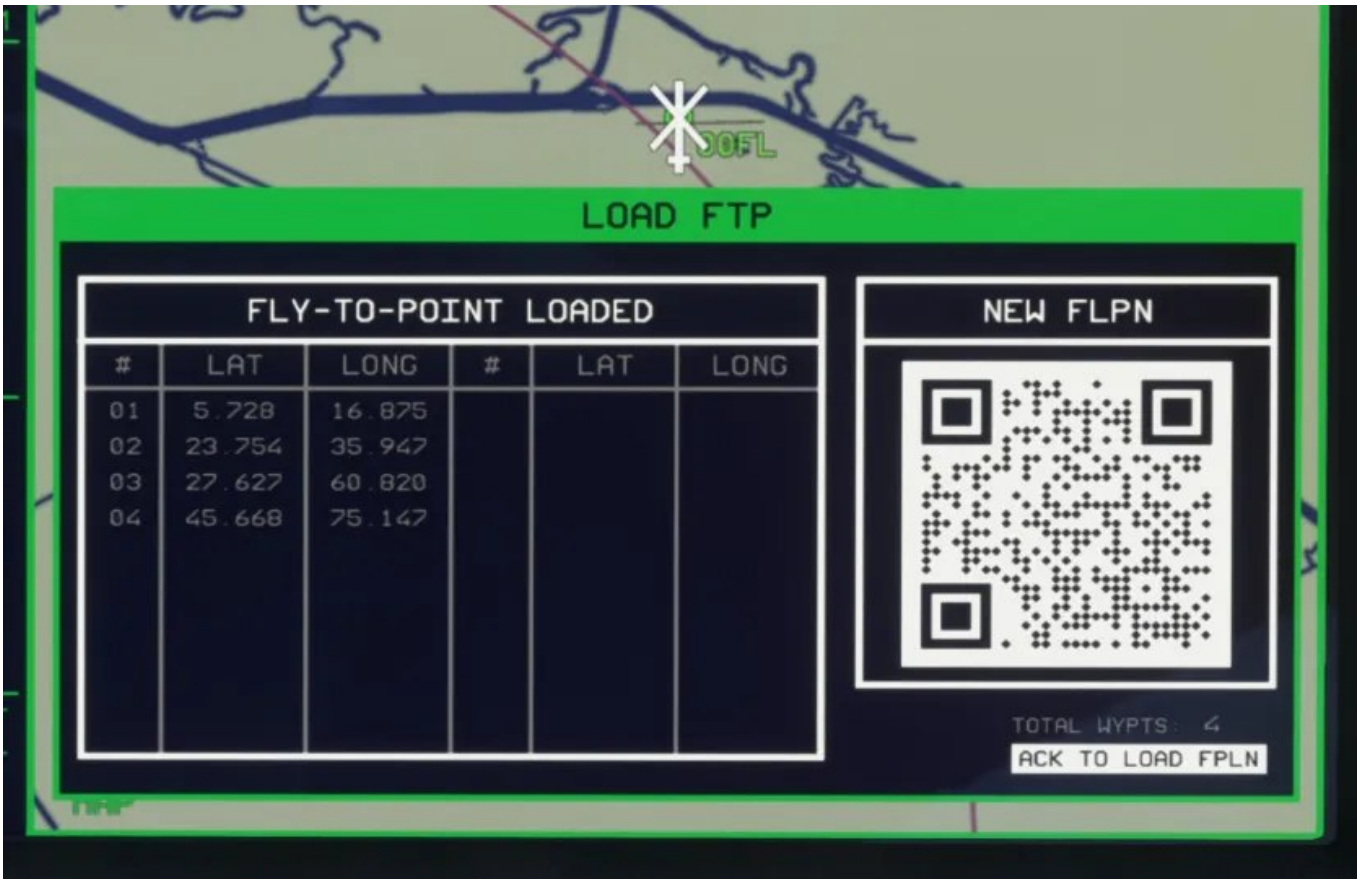
Quickly Load FTP (Fly-To-Point) Flightplans and "Datacards" from the Cloud

1. Navigate to the NAV Menu, and select LOAD FPLN.
2. The LOAD FTP Pop-up will display on the Mission Display (MD). PK Option on Keyset will now display as *FPLN*
3. Scan QR Code or enter insplanner.miltechsimulations.com. Use your mouse click to create waypoints on the map.
4. When the route has been completed, click on "Send to Aircraft". A 6-digit numeric code will be generated.
5. Return to the simulator, and using the Keyset numberpad, enter the 6-digit code. Press ENT to enter.



Flightplan #123456 has been entered. Press ENT

6. A preview of the loaded flight plan will render on the MD Pop-up. If the flight plan looks correct, press ACK (either on the Keyset or MD Bezel) to load into the map. If changes are made, you may reenter the code and press ENT to refresh.



Pop-up displaying Loaded Waypoints. Press ACK to continue.

7. You should now see your flight plan loaded onto the map. You may close the Pop-up by clicking on the *FPLN* PK Option on the Keyset.

This function simulates loading of coordinate-based Flight Plans on Datacards, which is the most commonly used navigation method on this sort of naval helicopters.

Edit and/or Create FTP (Fly-To-Point) Flightplans

1. Navigate to the NAV Menu, and select the FTP EDIT Submenu.
2. Three new options will open up on the Keyset PK Menu. Additionally, the NORM FTP Pop-up will display on the Mission Display.



FTP Edit Submenu, displaying option EDIT WYPT

3. Use the PG UP or PG DN keys, either on the Keyset or MD Bezel, to select a waypoint. "FTP---" Displays the selected waypoint number. Remember, anytime you see a white box highlighted WHITE, it is a cursor that may be interacted with PG UP/DN/LEFT/RIGHT.
4. After selecting the waypoint you wish to edit or enter, press EDIT WYPT on the Keyset. The waypoint’s coordinates will appear with a green background, indicating that the field is now active and ready to receive input.



NORM FTP Pop-up, Waypoint FTP002 Selected. Fields are highlighted green, indicating active for editing. Notice PG UP and PG DN buttons on the right bezel.

5. Use the Keyset numberpad to enter coordinates, starting with LATITUDE. First number indicates the direction - 2 for NORTH, 8 for SOUTH. Any other number is interpreted as NORTH. Then type the Degrees, Minutes and Seconds. Press ENT to insert.
6. If the entered coordinate is not valid, it will default to N00 00 00.
7. To deactivate editing and return to the previously stored value, you may press EDIT *WYPT* at any time.
8. Use the Keyset numberpad to enter LONGITUDE. First number indicates the direction - 3 for WEST, 5 for EAST. Any other number is interpreted as WEST. Then type the Degrees, Minutes Seconds. Press ENT to insert.
9. Once both coordinates are inserted, the flight plan will automatically reconstruct and reload.

You may repeat these steps to continue manually adding waypoints, or edit waypoints from existing flight plans.

If you prefer, you may also use LVAR L:MH60_Numeric_Stream to directly type into the fields using your keyboard.

Fly Direct-To-Point

1. Assuming you have an FTP Flightplan loaded, you may fly directly to any waypoint on the route, including search patterns. If you do not have an FTP Flightplan already, you may review the two expandables above.
2. Navigate to the NAV Menu, and select the FTP EDIT Submenu.
3. Three new options will open up on the Keyset PK Menu. Additionally, the NORM FTP Pop-up will display on the Mission Display.



FTP Edit Submenu, displaying option DRCT TO --

4. Use the PG UP or PG DN keys, either on the Keyset or MD Bezel, to select a waypoint. "FTP---" Displays the selected waypoint number. Remember, anytime you see a white box highlighted WHITE, it is a cursor that may be interacted with PG UP/DN/LEFT/RIGHT.
5. After selecting the waypoint you wish to fly directly to, press "DRCT TO --" on the keyset. The aircraft will automatically delete all other waypoints on your FTP Route, and create a Direct-To route from the current location to the selected waypoint (now FTP002).

Please note that this is a "destructive method" - eg. it will erase all other waypoints on your route. Direct-To waypoint while conserving the rest of the route is not supported at this time.

Delete FTP Flightplans

1. Assuming you have an FTP or Simulator Flightplan loaded, you may fully delete any waypoints or routing stored in memory. If you do not have an FTP Flightplan already, you may review the expandables above.
2. Navigate to the NAV Menu, and select the FTP EDIT Submenu.
3. Three new options will open up on the Keyset PK Menu. Additionally, the NORM FTP Pop-up will display on the Mission Display.

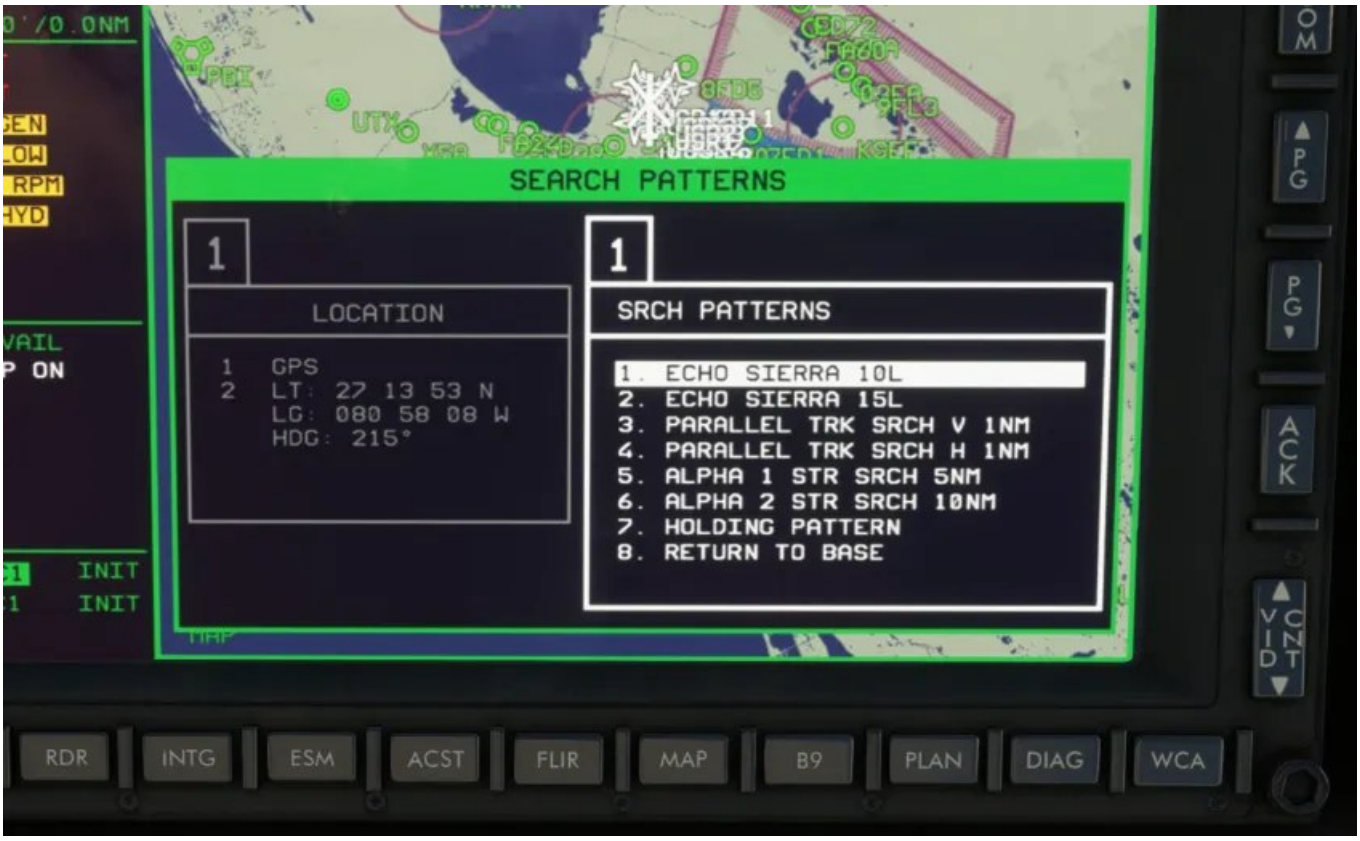


FTP Edit Submenu, displaying option CLR FPLN

4. Press CLR FPLN. This option will fully clear all waypoints from memory, as well as any route that has been loaded into the map. You may now create a new route.

Create Search Patterns

1. Navigate to the NAV Menu, and select SRCH PTTR option. This will open up the SEARCH PATTERN Pop-up menu on the Mission Display.
2. Use the PG UP or PG DN keys, either on the Keyset or MD Bezel, to move the cursor. Press ACK to select a Search Pattern. The FTP Flightplan will now be overwritten with the selected Search Pattern.



Search Patterns Pop-up Menu. Note PG UP, PG DN and ACK Buttons on the right bezel for navigation.

3. You may now close the Pop-up by pressing SRCH *PTTR*. Adjust Map Range as desired and fly the Search Pattern manually.

All Search Patterns are predefined and non-editable. They all originate from the aircraft location at the time of activation.

Set or Edit Base Location

Your "BASE" is defined as the location where the mission was initiated and/or a designated safe point for return and recovery. When the aircraft is first started up and EGIs are aligned, the Keyset will automatically set the current aircraft location as Base. However, the user may want to modify this base location manually.

1. Navigate to the NAV Menu, and select BASE UPDT. This will open up the Base Update submenu.
2. Three new options will appear:
3. SET BASE: Depressing this option will automatically set the current Latitude and Longitude as the base.
4. LAT: Displays the current Base Latitude.
5. LONG: Displays the current Base Longitude.



BASE UPDT Submenu, displaying LAT, LONG, SET BASE

3. To manually enter a base LAT/LONG, depress the corresponding button on the Keyset. The field now becomes an active input field (Highlighted by asterisks).
4. Use the keyset numberpad to enter the coordinates. The first number will represent direction:
5. For LAT: 2 is NORTH, 8 is SOUTH, any other number defaults to NORTH.
6. For LONG: 4 is WEST, 6 is EAST, any other number defaults to WEST.
7. Proceed with entering Degrees, Minutes and Seconds. Once complete, press ENT to enter. If the coordinate is valid, it will now be displayed on the keyset and represent the new Base location. If the coordinate is invalid, it will default to N00 00 00, or W000 00 00

Having an up-to-date base location is important, as Bingo Fuel calculations are based on this location. The MH60 also features a Quick Return-to-Base to take the most efficient and direct route back to the set base.

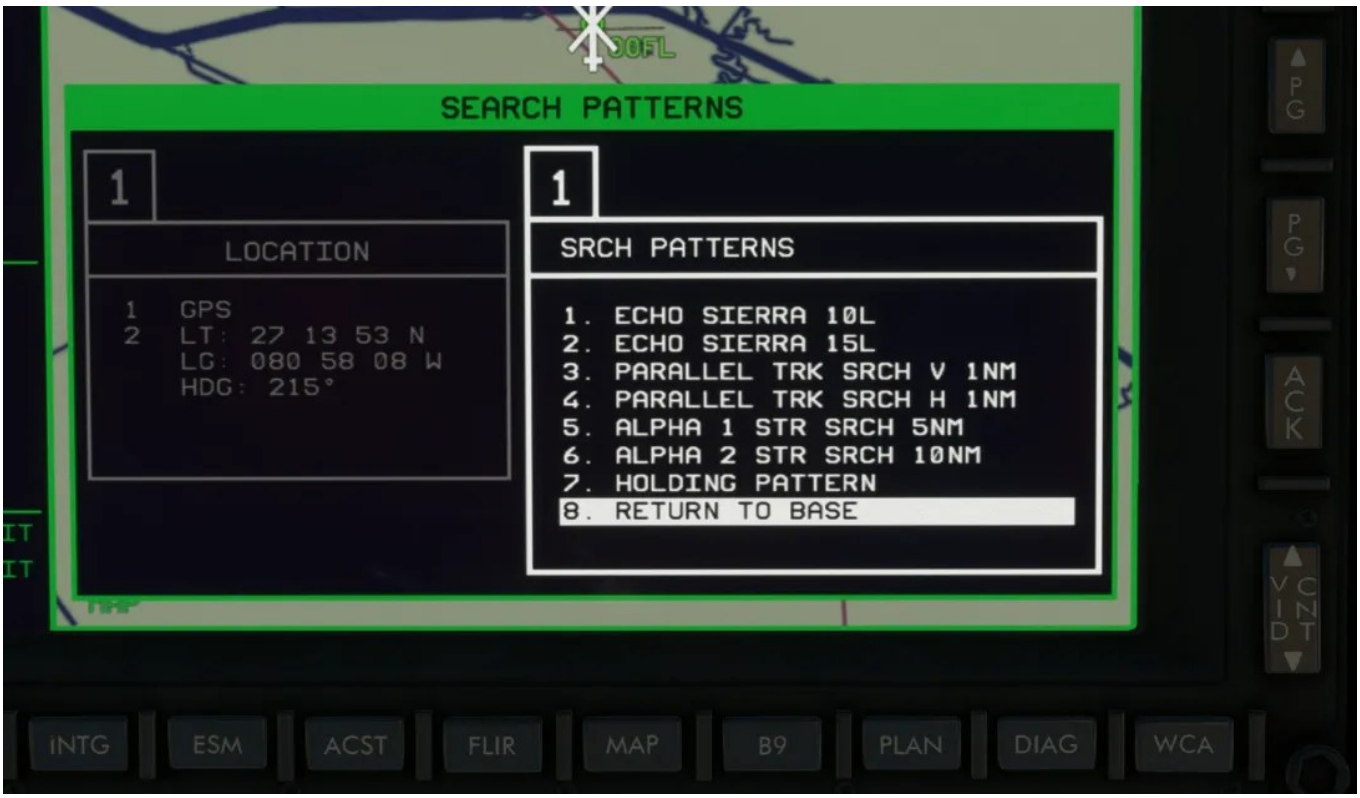
Quick Return-to-Base

Your "BASE" is defined as the location where the mission was initiated and/or a designated safe point for return and recovery. To set a Base, please see the expandable above.

To quickly return to your base, either because your mission is completed, or due to Bingo Fuel, follow these steps:

1. Navigate to the NAV Menu, and select BASE UPDT. This will open up the Base Update submenu.
2. Verify that LAT and LONG are correct, and correspond to the location of your base.

3. On NAV Menu, press SRCH PTTR. This will open up the SEARCH PATTERN Pop-up on Mission Display.
4. Use PG DN Key, either on the Keyset or MD Bezel, to navigate to the option "RETURN TO BASE". Press ACK to select.



SEARCH PATTERNS Pop-Up. Return to Base selected. Note PG DN and ACK Buttons on the right bezel

5. The aircraft will now automatically create a direct route between its current position and the base as defined by LAT, LONG on the keyset.

Handfly the route safely back to your base. The helicopter estimates a cruise speed of 100 knots, with a 20% safety margin for Bingo Fuel calculations.

Tune Communication Radios

1. Use the quick TUNE access from the Keyset Menu, or TUNE button on the Keyset keyboard, to access the TUNE Pop-up on Mission Display.
2. Use PG UP or PG DN, either on the Keyset or MD Bezel, to select a radio to tune. Remember, anytime you see a white box highlighted WHITE, it is a cursor that may be interacted with PG UP/DN/LEFT/RIGHT.
3. Once selected, press ACK or SEL (MD Bezel or Keyset) to enter a frequency.
4. The STBY FREQ will now appear with a green background, indicating that the field is now active and ready to receive input.
5. Use the Keyset numberpad to enter frequency. The decimal period is added automatically.



TUNE Pop-up. Note the green box indicating active for input on STBY. Note PG UP/PG DN/ACK Buttons on Bezel

4. Once completed, press ACK again to validate and change frequency. If the entered frequency is invalid, frequency will not be changed.
5. Alternatively, you may press ENT to directly validate the frequency and XFER to Active. You may also use ENT at any time while the TUNE Pop-up is open to XFER the frequencies selected.

Note
Alternatively, you may access V-UHF1 and V-UHF2 from COMM Menu, V/U1 and V/U2 respectively.
XFER is always available under COMM Menu without requiring TUNE Pop-up to be opened.

Tune Navigation Radios

1. Use the quick TUNE access from the Keyset Menu, or TUNE button on the Keyset keyboard, to access the TUNE Pop-up on Mission Display.
2. Use PG UP or PG DN, either on the Keyset or MD Bezel, to select a radio to tune. Remember, anytime you see a white box highlighted WHITE, it is a cursor that may be interacted with PG UP/DN/LEFT/RIGHT.
3. Once selected, press ACK or SEL (MD Bezel or Keyset) to enter a frequency.
4. The STBY FREQ will now appear with a green background, indicating that the field is now active and ready to receive input.
5. Use the Keyset numberpad to enter frequency. The decimal period is added automatically.



TUNE Pop-up. Note the green box indicating active for input on STBY. Note PG UP/PG DN/ACK Buttons on Bezel

4. Once completed, press ACK again to validate and change frequency. If the entered frequency is invalid, frequency will not be changed.
5. Alternatively, you may press ENT to directly validate the frequency and XFER to Active. You may also use ENT at any time while the TUNE Pop-up is open to XFER the frequencies selected.

Note
Alternatively, you may access LADF1 and VORTAC from NAV Menu, LADF TUNE and VTAC TUNE respectively. TACAN Mode X/Y (Affecting both TACAN1 and TACAN2) can be switched from NAV Menu/TACN MDE

Load and Arm Weapons

Loading and arming weapons (Hellfire Missiles, Torpedos and Guns) is executed from the Keyset.

Please refer to Weapons & Countermeasures Loading and Firing Procedures for full procedures.

Configure Aircraft and Cabin

Submenus "CABIN", "DOOR", and "CONFIG" can be used to easily and quickly configure the aircraft.

From these menus you may change the aircraft´s cabin for different type of activities (eg. Antisubmarine Warfare, Search and Rescue, etc.); load external Fuel Tanks or ERLP Rafts, among other functions.

For more information, refer to Main Menu (MENU)

Load External Sling Cargo

Loading External Sling Cargo is done from the Keyset, LOAD page.

1. Select a load from the menu.
2. Arm hook from the Overhead Panel.

3. Load will spawn 100 meters to the left or right of the aircraft, as selected on the keyset.
4. Takeoff and hover above the load for 5 seconds. Load will automatically attach.