v 3.6

Only compatible with UH-60L v1.4

DCS Guide Sikorsky MH-60R

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• Part 1 - Introduction

- The MH-60R Seahawk is a multi-mission helicopter, operated by the US Navy. It is also referred as Romeo. It is a further development of the SH-60B Seahawk, which in turn is based on the US Army UH-60 Black Hawk.
- Development of the MH-60R began in 1993. It was designed to combine features of the SH-60B and SH-60F anti-submarine warfare helicopters. First low-rate initial production helicopters were remanufactured form the SH-60Bs. However subsequent helicopters were newly built. The MH-60R was first deployed in 2009. Currently this helicopter is used by the US Navy (over 100 units) and Royal Australian Navy. Indian Navy ordered a total of 24 MH-60R helicopters. Deliveries commenced in 2022 and are planned to be completed in 2025.
- Main missions of the MH-60R Seahawk are Anti-Submarine Warfare (ASW) and Anti-Surface Warfare (ASuW). This helicopter can detect and track submarines and surface ships and attack with torpedoes and missiles.
- Secondary missions are search and rescue, combat search and rescue, vertical replenishment, medical evacuation and insertion and extraction of special forces.
- This helicopter is operated by a crew of 4 in anti-submarine warfare role and crew of 5 in anti-surface warfare role. It can also accommodate additional passengers.

© https://www.seaforces.org/usnair/HSM/Helicopter-Maritime-Strike-Squadron-51.htm

• Part 1 - Introduction

- The Seahawk has advanced mission systems and sensors. It carries advanced airborne active sonar, multi-mode search radar and nose-mounted forward-looking infrared (FLIR) turret. Its multi-mode search radar has an automatic periscope detection and discrimination capability. Also it carries air-launched sonobuoys. However magnetic anomaly detector suite was removed. Data is transferred via advanced airborne fleet data link.
- The MH-60R has improved offensive capabilities comparing with SH-60B or SH-60F. It has stub wings and can carry two Mk.46, Mk.50 or Mk.54 light air-launched torpedoes, two AGM-119B Penguin anti-ship missiles or four AGM-114 Hellfire air-to-surface missiles. A single door-mounted 7.62 mm or 12.7 mm machine gun can be fitted.
- The MH-60R has two General Electric T700-GE-401C turboshaft engines, developing 1 900 shp each. These are the same engines of the SH-60B.
- The MH-60R has a folding main rotor and a hinged tail, that can be also folded. This allows to reduce footprint aboard ships. Cockpit instrumentation and displays are similar to that of the MH-60S.
- The MH-60R, as well as all other US Navy's H-60 series helicopters, has a rescue hoist for search and rescue missions. For vertical replenishment tasks it can be fitted with a 2.7 t capacity cargo hook.
- For extended range this helicopter can carry external fuel tanks. The helicopter has an integrated self-defense system.

© MH-60R Seahawk Anti-Submarine Warfare Helicopter | Military-Today.com

- The DCS Mod of the MH-60R is based on the aircraft used by the HSM 51 “Warlords” squadron:
- Helicopter Maritime Strike Squadron Five One (HSM-51) "WARLORDS" is a United States Navy helicopter squadron based at the Naval Air Facility Atsugi, Ayase City, Kanagawa Prefecture , Honshu, Japan.
- HSM-51 one of the seven squadrons making up the Helicopter Maritime Strike Wing, Pacific Fleet, based out of San Diego which deploys aboard multiple ships in the U.S. Navy's Seven Fleet that is based in Yokosuka, Japan.

• Part 2 - Installation

- The Sikorky MH-60R SeaHawk for DCS is a evolution of the UH-60L Blackhawk mod developed by (=X51= Kinkkujuustovoileipa, Cubeboy, Bailey)
- Extract a copy of original UH-60L folder v1.4 without any mod : UH-60L 1.4
- Rename this copy : MH-60R :
- You must remove :
  - Remove 'KC-103J.lua' file
  - Remove 'UH-60L.lua' file
  - In 'bin' folder : remove all files with UH-60L name
  - Remove 'ImagesGui' folder
  - Remove 'Input' folder
  - Remove 'Liveries' folder
  - Remove 'Missions' folder
  - Remove 'Options' folder
  - Remove 'Shapes' folder
  - Remove 'Skins' folder
  - Remove 'UnitPayLoads' folder
  - **DO NOT REMOVE 'Sounds' folder**
- Download the MH-60R v3.6 mod : MH-60R
- Extract the files and install the MH-60R mod in this copy, than place this file in your DCS Save game location :
  - STEAM/NON-OPEN BETA: C:\Users\###\Saved Games\DCS\ Mods\Aircraft
  - STANDALONE OPEN BETA: C:\Users\###\Saved Games\DCS.openbeta\ Mods\Aircraft
- You may require the latest C++ redistributables for this mod to work properly

• Part 3 - Cockpit

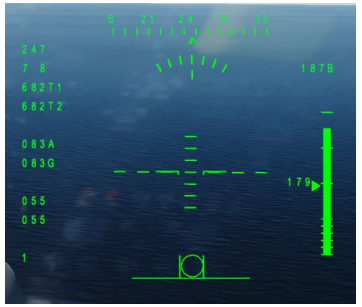
- **Description :**
  - The MH-60R has the same cockpit and instrument as the UH-60L
  - We recommend you to look directly at the UH-60L guide for complete explanation and details : (document available in the DOC\ manuel-en\images of the UH-60L folder)
  - There is only two panels which have been added in order to command the sonar and sonobuoys (located on the copilot side) and the other to activate and select the weapons (located on the pilot side).

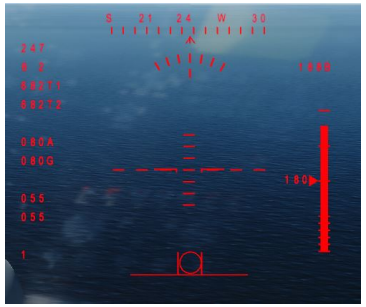
Sonobuoy and sonar panel

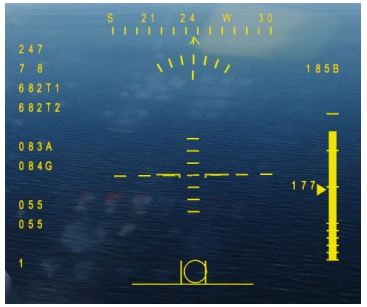
Armement panel

• Part 3 - Cockpit

- **Description :**
  - **HUD color :**
  - The HUD color can be changed now using a dedicated cycling keybind :
    - ‘Lalt’ + ‘G’ = ‘GunSight / HUD color’
  - There is tree different colors available:
    - Green
    - Red
    - Orange







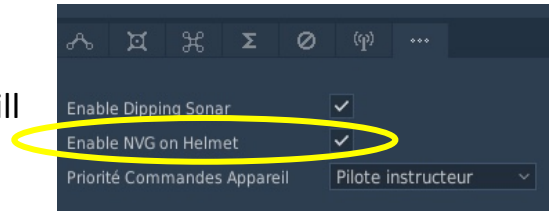
  - **Seats positions :**
  - There is now 5 different possible positions in the MH-60R
    - ‘1’ = ‘Occupy Pilot Seat’
    - ‘2’ = ‘Occupy Copilot Seat’
    - ‘3’ = ‘Occupy Sonar Operator Seat’
    - ‘4’ = ‘Occupy Winch Operator Position’
    - ‘5’ = ‘Occupy Gunner Position’

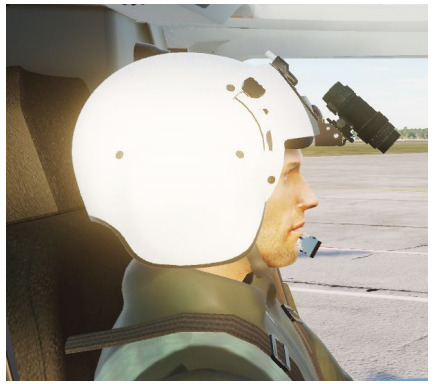
• Part 3 - Cockpit

- **Description :**
  - **Pilot Helmet :**

- A sun visor has been implemented (keybind : ‘Lalt’ + ’H’) for player and (Keybind : ‘Ralt’ + ‘H’) for all characters inside the aircraft (including player)

- The NGV can be installed using the option menu in the mission editor.
- This is just a graphic element. Even if not installed, the NVG function will operate normally.
- To activate the night vision you can use a keybind : ‘N’

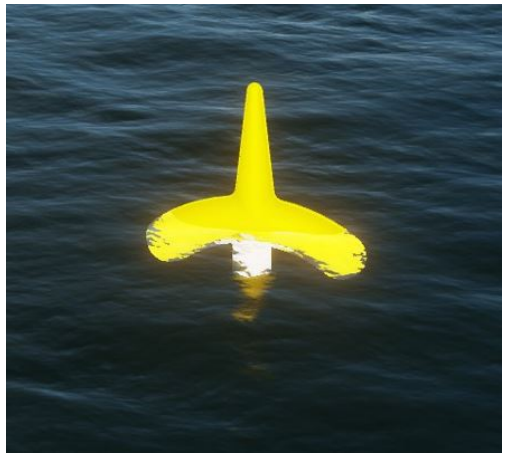




• Part 4 – Sonobuoys usage

- **Keybind :**
  - For cover and arm :
    - 'LAlt' + ‘M' = 'Master Sonobuoys Cover - OPEN/CLOSE’
    - ‘M' = 'Master Arm Sonobuoys - OFF/ON’
  - To dispense
    - 'LCtrl' + ‘M' = 'Sonobuoy Dispense‘

- **Sonobuoys usage condition :**
  - The sonobuoys can be dispensed whatever the altitude and whatever the speed.
  - 30 second after they touch the water they start to emit and provide information when a ship is passing under their range of survey (maximum range 10 Km).



• Part 4 – Sonobuoys usage

- 1) Open the sonobuoy switch cover => message “SONOBUOY SWITCH COVER UP”
- 2) Armed the sonobuoy => message “SONOBUOY ARMED”
  - If this button is not selected you will not be able to launch any sonobuoy.
- 3) Dispense the sonobuoy => message “Buoy n°X dropped”
  - X correspond to the number of the sonobuoy it increase each time you dispense a new sonobuoy.
- 4) Disarmed the sonobuoy => message “SONOBUOY DISARMED”
- 5) Close the sonobuoy switch cover => message “SONOBUOY SWITCH COVER CLOSE”
  - When closing the cower it will automatically switch “OFF” the arm switch

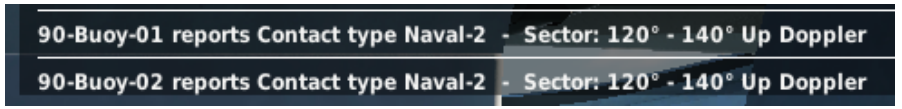
- The Sonobuoy control panel is also available on the Radar console left side.
  On the Sonar console (Seat Key 3), a 3 position switch allows to discriminate the detection of surface ships or submarines or none. *read the new AWS script explanations in annexe
- The depth setting must be made before the sonobuoy is released and
- is done so by using the rotary knob. *read the new AWS script explanations in annexe

- By default the switch is on Off, as soon as a sonobuoy is ejected, it will switch on 'Immersion', you can switch back to Off to deactivate the detection or switch to Surface to detect only ships. *read the new AWS script explanations in annexe
  To turn off receiving sonobuoy contact messages set the Sonar switch to 'Master ON'.

- You can also use a keybind : ‘LAlt' + ‘LCtrl’+ ‘LShift’+ 'S' = ‘SonoBuoys State - IMMERSION/OFF/SURFACE’

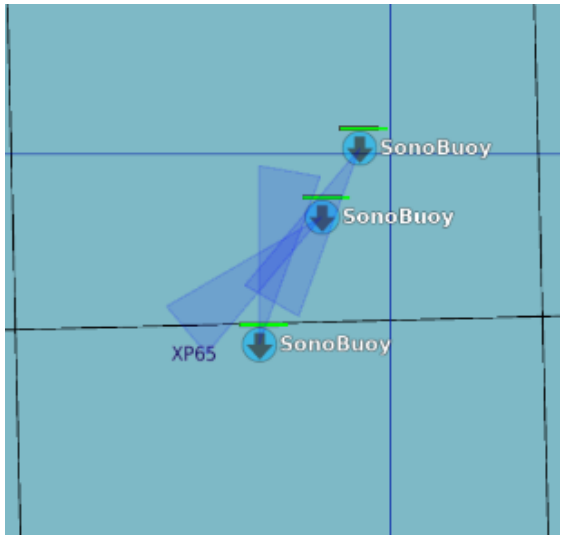
• Part 4 – Sonobuoy usage

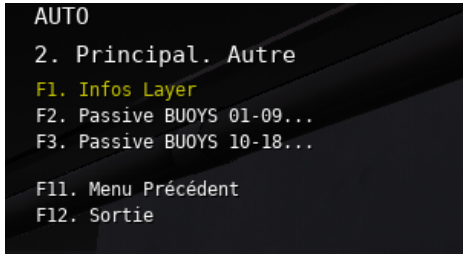
- **Sonobuoys operation :** *read the new AWS script explanations in Annexe
  - 30 seconds after the sonobuoy touches the water, it starts to emit.
  - When a ship or a submarine enter in his detection range (10 Km), it will automatically provide to the helicopter a vector location by 20° steps. *read the new AWS script explanations in Annexe
  - If you have got several sonobuoys in the water, each of them will provide you its sector. By triangulation you will be in a position to determine in which sector is located the ship or the submarine.
  - The sectors will be displayed in your map (F10)
  - The information provided by the sonobuoys are refreshed every 2 seconds
  - When you have estimate the location of your target, fly to it and use your sonar to get a more accurate position of the target (refer Part 5)
  - Via the radio menu F10, you can select ejected buoys to destroy them
  - Sonobuoys have an autonomy of 30', then they are deactivated and destroyed

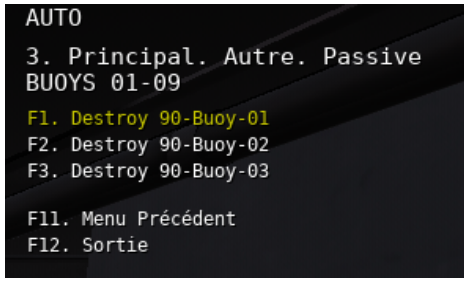


The name of the buoy is composed as follows:
90 → depth
02 → n° of Buoy

'Doppler' indicates whether the contact is approaching (Up) or moving away from the sonobuoy (Down)

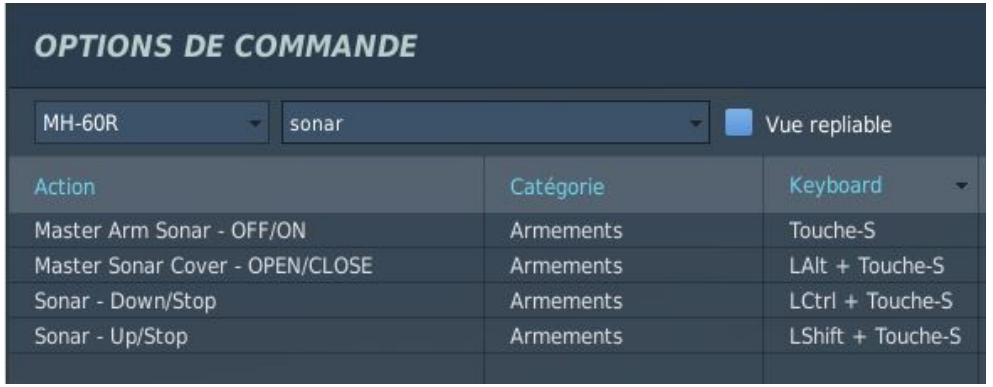






• Part 5 – Sonar usage

- **Keybind :**
  - For cover and arm :
    - 'LAlt' + 'S' = 'Master Sonar Cover - OPEN/CLOSE'
    - 'S' = 'Master Arm Sonar - OFF/ON'
  - For descent :
    - 'LCtrl' + 'S' = 'Sonar - Down/Stop'(this key is toggle)
  - For rise :
    - 'LShift' + 'S' = 'Sonar - Up/Stop' (this key is toggle)
  - For Range selection :
    - 'LAlt' + 'LShift'+ 'S' = 'Inc Range Sonar'
    - 'LAlt' + 'LCtrl'+ 'S' = 'Dec Range Sonar'



- **Installing the sonar on the aircraft :**
  - In order to equip the sonar, you must enable the option in the mission editor

• Part 5 – Sonar usage

- **Sonar usage condition :** *read the new AWS script explanations in Annexe

  - The dipping sonar can be deployed to user commanded depths.
  - The depth of the sonar sensor is adjustable down to 800ft and is done at the sonar operator console.
  - The sonar must be deployed at a maximum altitude of 75 feet.

  - The sonar operator console also features a cable length counter displaying sonar cable length that has been deployed.

  - Sonar contact is only held on the sensor if the speed is under 10kts and a contact is within detection range

    *read the new AWS script explanations in annexe

  - When Sonar is into the water and if your speed reach or overpass 30kts, the sonar will be automatically destroyed and disappear.
    - Message “Sonar destroyed” *read the new AWS script explanations in annexe

• Part 5 – Sonar usage

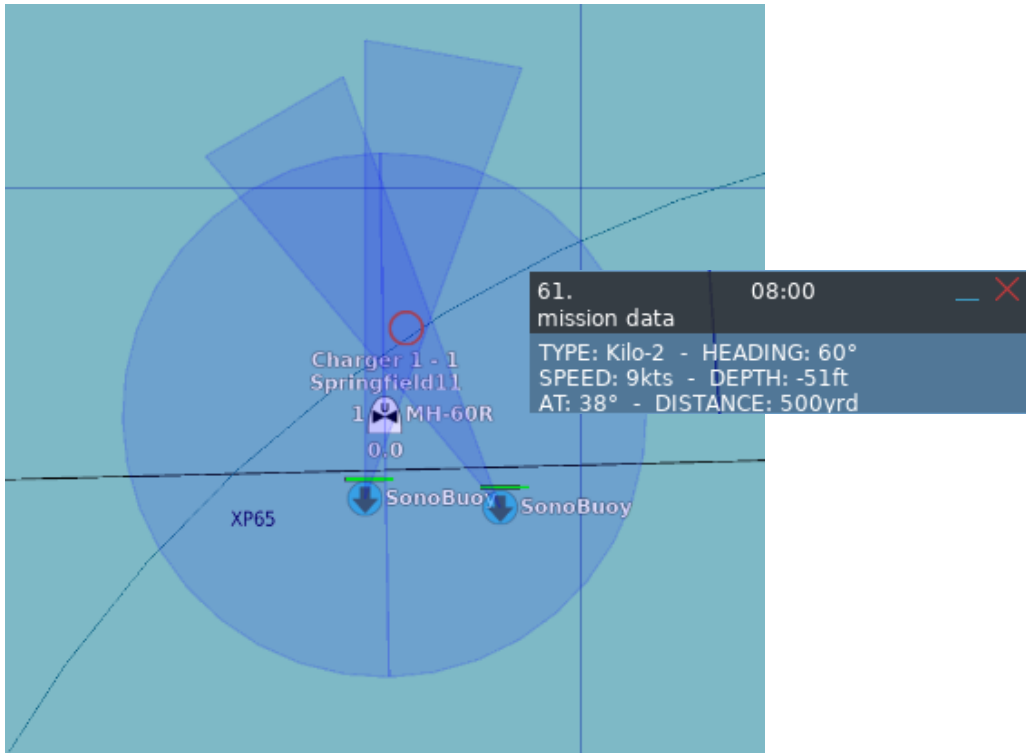
- 1) Open the sonar switch cover => message “SONAR SWITCH COVER UP”
- 2) Armed the sonar => message “SONAR ARMED”
  - If this button is not selected you will not be able to descend or climb the sonar.
- 3) Deploy the sonar to the desired depth *read the new AWS script explanations in Annexe
  - You will get the message : “Sonar Depth : xxx feet” every 25 ft.
- 4) When you stop the sonar
  - You will get these messages :
    - "Sonar cable length : xx feet"
    - "Sonar depth : xx feet"
- **Your Sonar is ready for usage (refer next page)**
- 4) Retract the sonar *read the new AWS script explanations in Annexe
- You will get the message : “Sonar Depth : xxx feet” every 25 ft.
  - When sonar is fully retracted you will get the message => “Sonar UP”
  - Nota : the switch has to be set on the “STOP” position after usage
- 5) Disarmed the sonar => message “SONAR DISARMED”
- 6) Close the switch cover => message “SONAR SWITCH COVER CLOSE”
  - If you close the cover when the sonar is still armed this action will automatically disarmed the sonar
  - You will get a message => “Sonar switch cover close” and “Sonar disarmed”

• Part 5 – Sonar usage

- **Sonar operation :** *read the new AWS script explanations in Annexe
  - When arriving into the water and if any boat or submarine enter in the sonar detection area
  - They will indicate to the pilot the following information:
  - On the map (F10) the location of the target will be provided by several red circles close to each other
  - indicating the orientation of the target.

  - By clicking on the circle in front of the target, information will be displayed for approximately 4” when the target is detected.

  - The information will be refreshed in the cockpit and on the map every 1 second.



• Part 6 – Winch Usage

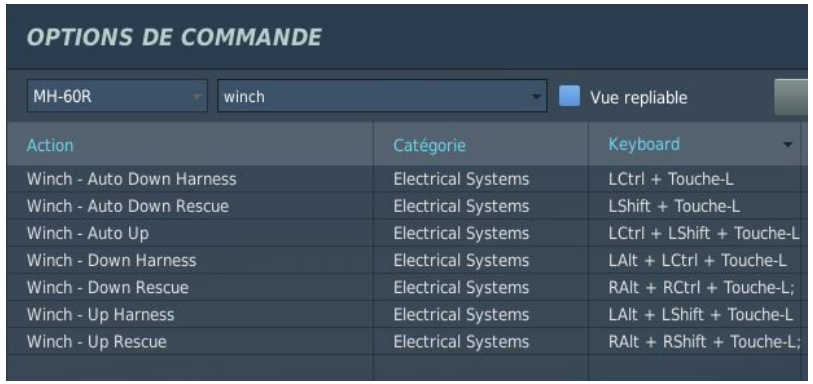
- **Keybind in automatic mode :**
  - KEYBIND : By default, 3 keybinds for the commands as in the initial version
    - 'LShift' + L ' = 'Winch – Auto Down Rescue'
    - ‘LAlt' + ‘LCtrl’ + ‘LShift' + ‘H' = 'Winch – Auto Down Harness‘
    - Refer § “Keybind for diver operation” for the other commands

Action	Catégorie	Keyboard
Winch - Auto Down Harness	Electrical Systems	LCtrl + Touche-L
Winch - Auto Down Rescue	Electrical Systems	LShift + Touche-L
Winch - Auto Up	Electrical Systems	LCtrl + LShift + Touche-L
Winch - Down Harness	Electrical Systems	LAlt + LCtrl + Touche-L
Winch - Down Rescue	Electrical Systems	RAlt + RCtrl + Touche-L;
Winch - Up Harness	Electrical Systems	LAlt + LShift + Touche-L
Winch - Up Rescue	Electrical Systems	RAlt + RShift + Touche-L;

- **Winch usage condition in automatic mode :**
  - Cargo door must be opened
  - Now the gun can be installed but for to use the winch, the gun must be folded up, see Part 7 page 27.
  - Helicopter altitude must below 60ft in order deposit the harness or rescued people.
  - You must remain stable (altitude) during X seconds in order to validate your hoist (X adjusted in the DCS Option parameter)

• Part 6 – Winch Usage

- **Keybind in manual mode :**
  - By default, 4 keybind for the commands as in the initial version
    - 'RAlt' + 'RShift' + 'L' = 'Winch - Up Rescue'
    - 'RAlt' + 'RCtrl' + 'L' = 'Winch - Down Rescue'
    - 'LAlt' + 'LShift' + 'L' = 'Winch - Up Harness'
    - 'LAlt' + 'LCtrl' + 'L' = 'Winch - Down Harness'



Action	Catégorie	Keyboard
Winch - Auto Down Harness	Electrical Systems	LCtrl + Touche-L
Winch - Auto Down Rescue	Electrical Systems	LShift + Touche-L
Winch - Auto Up	Electrical Systems	LCtrl + LShift + Touche-L
Winch - Down Harness	Electrical Systems	LAlt + LCtrl + Touche-L
Winch - Down Rescue	Electrical Systems	RAlt + RCtrl + Touche-L;
Winch - Up Harness	Electrical Systems	LAlt + LShift + Touche-L
Winch - Up Rescue	Electrical Systems	RAlt + RShift + Touche-L;

- **Winch usage condition in manual mode :**
  - Cargo door must be opened and gun must not be installed

  - The logic is that pilot can choose to lowered the harness or the harness + a rescued people. Same when it will lift.

    1) Start of the IA hoist (harness only or harness + rescued people)

    2) You have to maintain the command to descend the hoist. Each time the descends is stopped , the altitude below the aircraft is displayed. This information allow the pilot to adjust his altitude or to continue using the hoist.

    3) When the harness is fully extended (60ft) , message “HARNESS DOWN” is displayed

    4) Lift control button (harness only or harness + rescued people). Each time the lift is stopped the altitude below the aircraft is displayed.

    5) When the harness is fully retracted, message ‘HARNESS UP’ is displayed

• Part 6 – Winch Usage

- **Keybind for diver operation :**
  - By default, 4 keybind for the commands as in the initial version
    - ‘LCtrl’ + ‘D' = ‘Diver - Drop‘
    - ‘LAlt' + ‘LCtrl’ + ‘LShift' + ‘D' = 'Winch – Auto Up Diver'
    - ‘LAlt' + ‘LCtrl’ + ‘LShift' + ‘R' = 'Winch – Auto Up Rescue'
    - ‘LAlt' + ‘LCtrl’ + ‘LShift' + ‘B' = 'Winch – Auto Up Binome'

OPTIONS DE COMMANDE

MH-60R | CSAR | Vue re

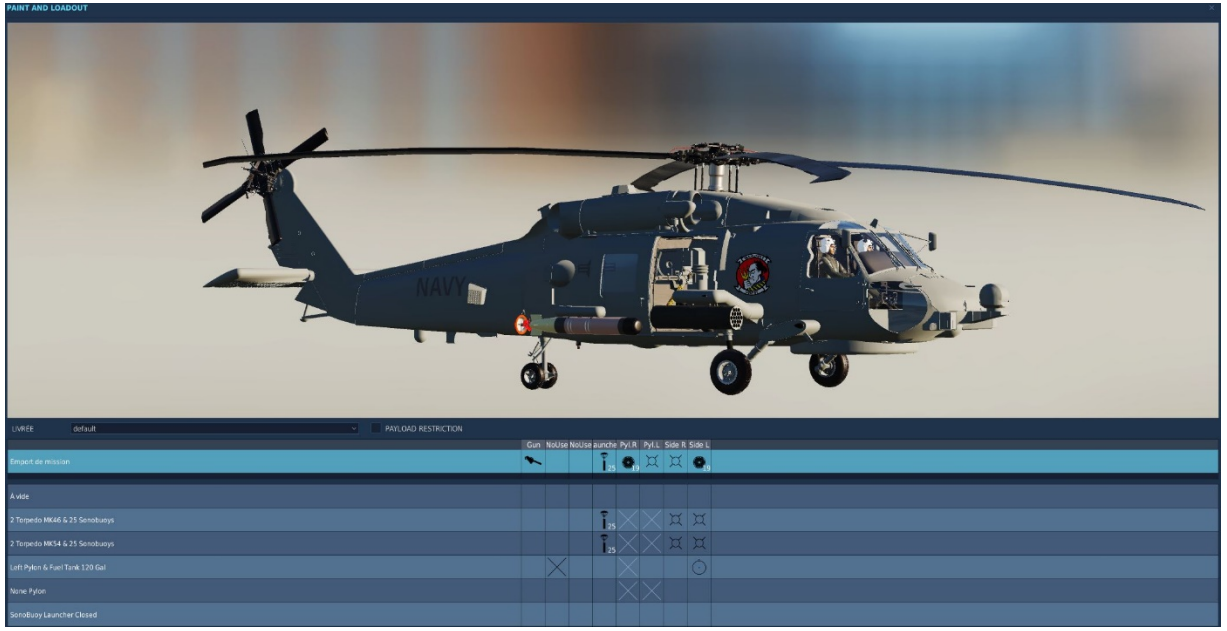
Action	Catégorie	Keyboard
Diver - Drop	CSAR	LCtrl + Touche-D
Winch - Auto Down Harness	CSAR	LAlt + LCtrl + LShift + Touche-H
Winch - Auto Down Rescue	CSAR	LCtrl + Touche-L
Winch - Auto Up	CSAR	LAlt + LCtrl + LShift + Touche-W
Winch - Auto Up Binome	CSAR	LAlt + LCtrl + LShift + Touche-B
Winch - Auto Up Diver	CSAR	LAlt + LCtrl + LShift + Touche-D
Winch - Auto Up Harness	CSAR	LAlt + LCtrl + LShift + Touche-L
Winch - Auto Up Rescue	CSAR	LAlt + LCtrl + LShift + Touche-R
Winch - Down Harness	CSAR	LAlt + LCtrl + Touche-L
Winch - Down Rescue	CSAR	RAlt + RCtrl + Touche-L
Winch - Up Harness	CSAR	LAlt + LShift + Touche-L
Winch - Up Rescue	CSAR	RAlt + RShift + Touche-L

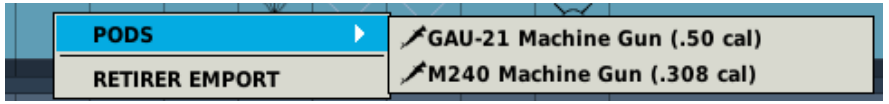
- **Diver operation :**
  - Cargo door must be opened and gun must not be installed
  - When the “diver drop” command is activated, you will receive information in order to be in good condition for jump.
    - Helicopter speed must be below 4 Kts
    - Helicopter altitude must be below 15ft
  - When these conditions are both met, the diver will automatically jump and you will receive the message “Diver down”

- **CSAR mission :**
  - For the rest of the operation and more details, refer §9 - Mission edition “CSAR”

• Part 7 – Armament

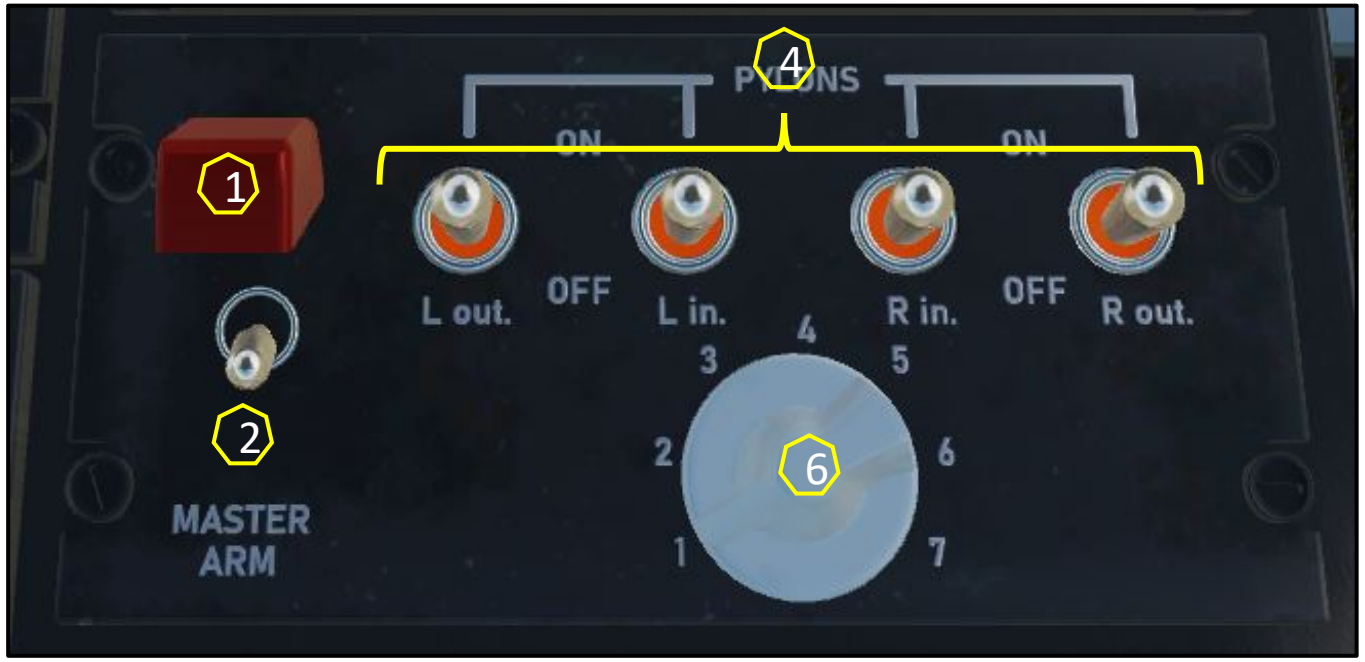
- **Armament points :**
  - MH-60R can be equipped with two lateral supports to carry different type of load.
  - Loadout maybe selected from the predefined unit loadouts provided, via the mission editor, or via the un mission Rearm/Refuel window.
  - MH-60R can be equipped with two front outboard that can bring:
    - M261 - 19 X Hydra 70 M151 HE rockets,
    - M299 - 4 X AGM-114K Hellfire missiles,
    - M299 - 2 X AGM-114K Hellfire missiles.
  - MH-60R is also equipped with two rear outboard points that can bring:
    - 1 X MK46 Torpedo (unguided)
    - 1 X MK54 Torpedo (guided) **using the template and script**
    - 2 X 120 Gal Fuel tanks
  - For the Sub-marine track/chasse, the MH-60R can carry out 25 sonobuoys installed in a compartment located inside and on the left side of the aircraft.
    - 25 X Buoys
  - Guns can also be installed on the right door (refer § Gun usage p26 for usage explanation)
    - GAU-21 - Machine Gun (0.5 cal)
    - M240 - Machine Gun (0.308 cal)





• Part 7 – Armament

- **Launching ordonance :**
  - 1) Up the master arm cover switch => message “WEAPONS SWITCH COVER UP”
  - 2) Turn “ON” your master arm switch => message “WEAPONS ARMED”
  - 3) Turn “ON” your Gunsight
  - 4) Select the pylon(s) you whish to fire => message example “LEFT OUTBOARD STATION ON”
  - 5) Press the “Weapon Release” button.
  - 6) For rockets, you can select how many rockets will be fired using the rotating button. You can select from 1 to 7.
- **Nota :**
  - Refer next page for Gunsight operation



• Part 7 – Armament

Gunsight operation:

- In order to be able to use the gunsight, the helicopter front external pylon must equipped with armament and both master arm cover and master arm switch must be activated.

- Gunsight ON/OFF
  - ‘G’ = ‘Gunsight ON/OFF’
  - ‘RCtrl’ + ‘G’ = ‘Gunsight OFF’
  - ‘Rshift’ + ‘G’ = ‘Gunsight ON’

- Gunsight Brigtness
  - ‘LCtrl’ + ‘G’ = ‘Gunsight Dim’
  - ‘Lshift’ + ‘G’ = ‘Gunsight Brighten’

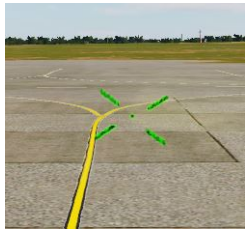
- Gunsight elevation can be adjusted using keybind or using the mouse wheel under the gunsight:
  - ‘LAlt' + ‘LShift' + ‘G' = ‘Gunsight Up’
  - ‘LAlt' + ‘LCtrl’ + ‘G' = ‘Gunsight Down’
  - ‘LAlt' + ‘LCtrl’ + ‘LShift' + ‘G‘ = ‘ Gunsight Reset’

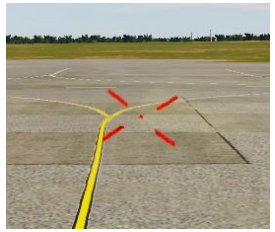
- Gunsight color can be adjusted using keybind or mouse by clicking on the gunsight.
  - ‘Lalt’ + ‘G’ = ‘Gunsight color / HUD Color’
- There is tree different colors available : Black, Green and Red

OPTIONS DE COMMANDE

MH-60R | Gunsight | Vue

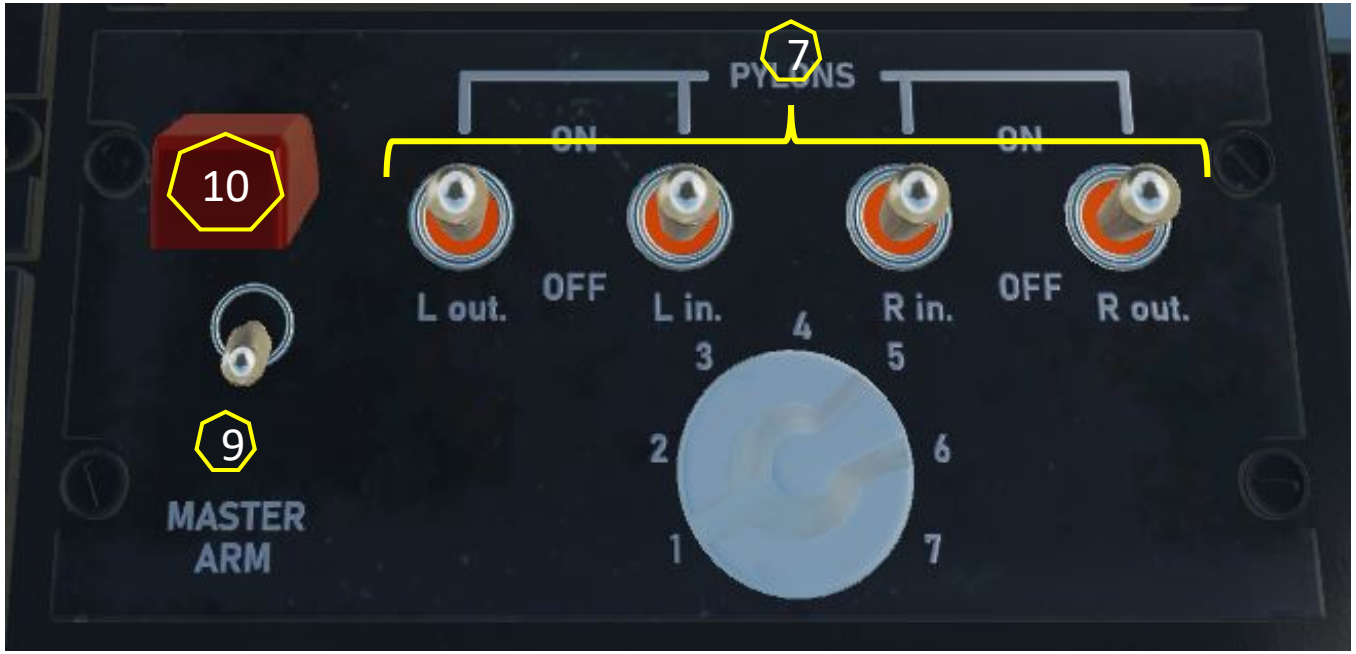
Action	Catégorie	Keyboard
GunSight / HUD Color	Armements	LAlt + Touche-G
GunSight Brighten	Armements	LShift + Touche-G
GunSight Dim	Armements	LCtrl + Touche-G
GunSight Down	Armements	LAlt + LCtrl + Touche-G
GunSight OFF	Armements	RCtrl + Touche-G
GunSight ON	Armements	RShift + Touche-G
GunSight ON/OFF	Armements	Touche-G
GunSight Reset	Armements	LAlt + LCtrl + LShift + Touche-G
GunSight Up	Armements	LAlt + LShift + Touche-G





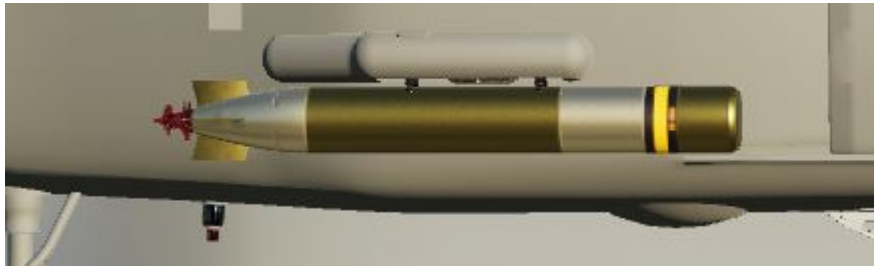
• Part 7 – Armament

- **Reset of the armament system :**
  - 7) Unselect the pylon(s) => message example “LEFT OUTBOARD STATION OF”
  - 8) Turn “OFF” your Gunsight
  - 9) Turn “OFF” your master arm switch => message “WEAPONS DISARMED”
  - 10) Close the master arm cover swtich => message “WEAPONS SWITCH COVER CLOSE”

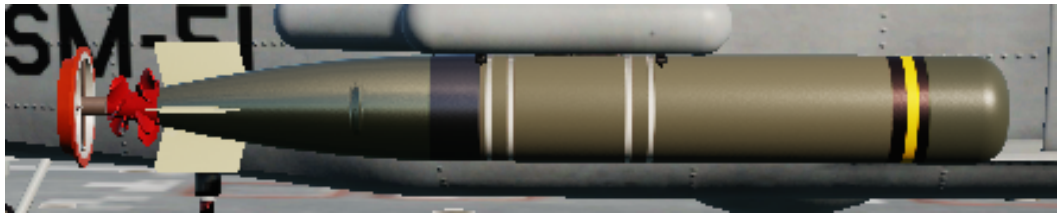


• Part 7 – Armament

- **<u>Torpedos usage :</u>**
  - There is two types of torpedoes available for the MH-60R, the MK46 and the MK54.
  - It is recommended to launch torpedoes low and slow, less than 20 Kts and less than 30 ft
  - **The MK46** is an unguided torpedo, the pilot has to anticipate the target speed, distance and direction in order to launch the torpedo at the good moment. (to be used only for surface vessels)
  - **The MK54** is a guided torpedo dedicated to attack sub-marine and ships. ***read the new AWS script explanations in Annexe**
- Surface torpedo mechanics have not changed with the introduction of surface radar.
- For subsurface torpedo engagements you no longer need a firing solution as was the case in previous versions
- When a torpedo is dropped, the weapon will begin a circle search pattern.
- If a contact is detected by the torpedo during the search, it will then home in until it hits the target.



MK46



MK54

• Part 7 – Armament

- **MK54 Torpedos usage :** *read the new AWS script explanations in Annexe
  - The torpedo is capable of following maneuvering contacts and will intercept contacts even if their course is not completely stable.

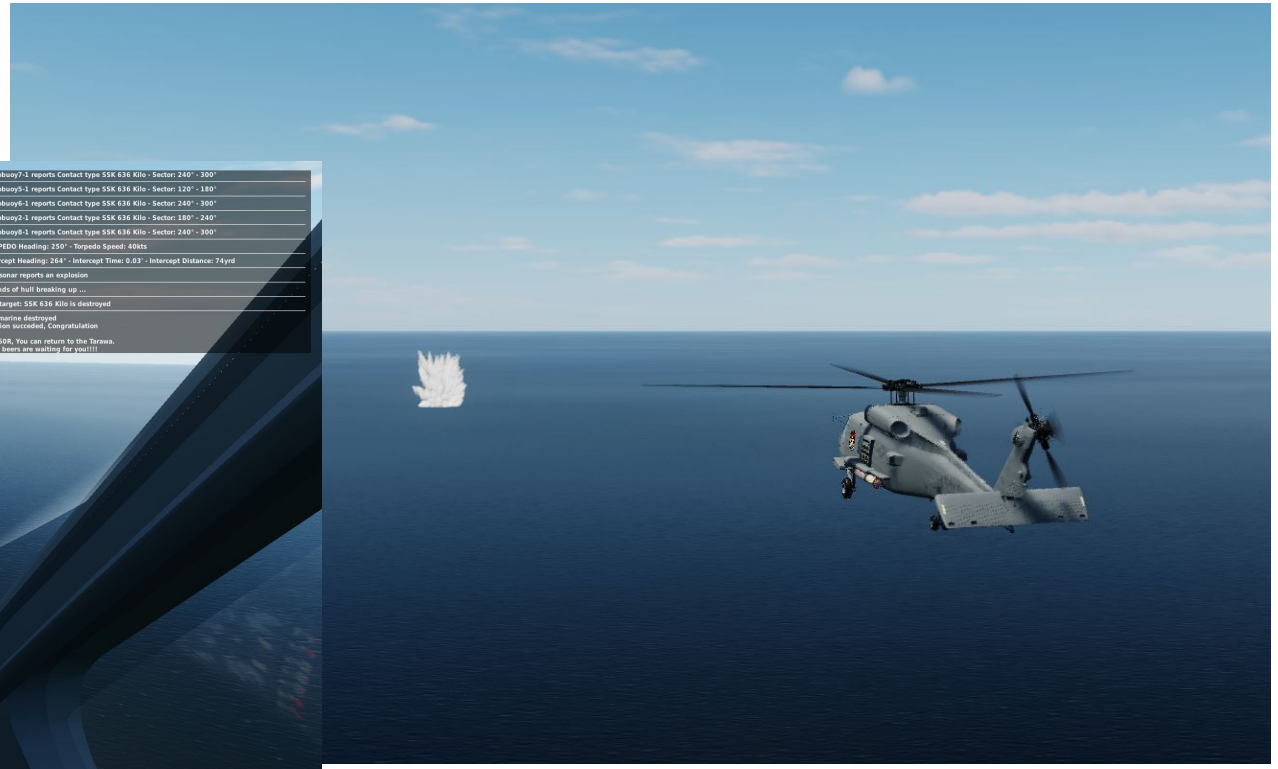
- **MK54 Torpedo operation explanation :** *read the new AWS script explanations in Annexe
  - The circle search pattern starts a clockwise spiral with an initial diameter of 500 yards. Each semicircle of distance traveled will increase the diameter by 500 yards.
  - The weapon will continue to do this growing spiral pattern until it runs out a total length of 10,000 yards.
  - At about every 56 yards a position tick of the torpedo is marked on the F10 map to help you track its progress.

  - It is important to keep in mind that the torpedoes are unable to discriminate friend from foe and from civilian vessels.
  - Like sonobuoys and the dipping sonar, the torpedo's detection range is affected by the surface layer and contact positioning.
  - Detection range of the torpedo is displayed under 'Info' in the F10 radio menu.

  - Once a submarine is hit by a torpedo a message will be displayed indicating whether a second weapon will be needed for re-attack or if the hit was enough to destroy the vessel.

• Part 7 – Armament

- **Torpedos usage :**

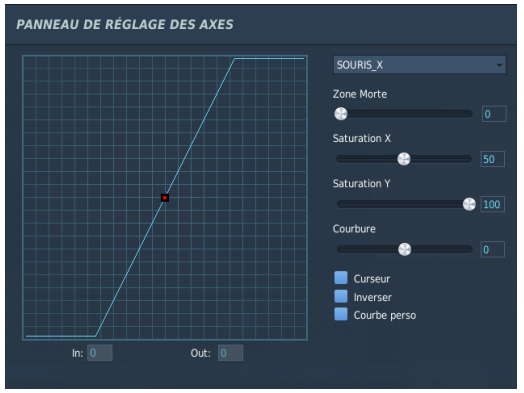


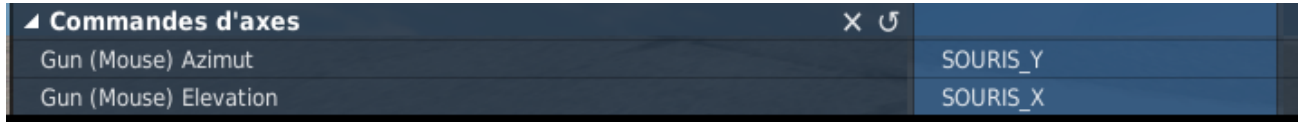
• Part 7 – Armament

- **Gun usage :**
  - There is two type of gun available for the MH-60R, the M240 and M3M.
  - To take control of the gun, use the gunner seat position (5) - For fire the Master Arm must be ON and no pylon selected.
  - Gun axes can be set on joystick axes, using mouse, keybind or gamepad with button, the mouse usage is more accurate.
- **Keybind :**
  - Some keybinds for slow and fast movements.
  - Keybind or Mouse button to fire 'Pilot Cyclic Gun Trigger'

- **Mouse :**
  - Need to assign a key or mouse button to switch the cockpit mode,

  - Assign for each Mouse Axis with 50% for standard value, the higher the value, the smaller the displacement.





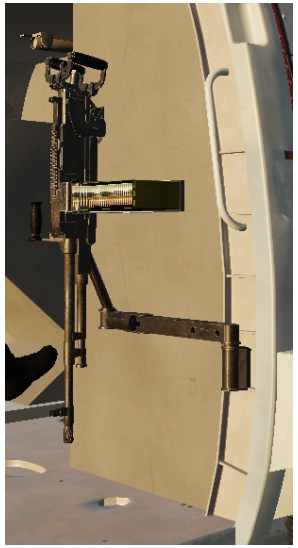
- **Nota :** In MultiCrew, the pilot will always see the guns bullet going in the same right direction.

Only the gunner can see the gun and bullets changing of direction (issue to be fixed in the future if possible)

• Part 7 – Armament

- **Gun folder :**
  - Gun can be used during CSAR
  - To use the winch, the gun must be folded up.
    - with the 0.3 (M240)
      - a keybind to retract the gun inside

M240 Toggle Folding	RAlt + Touche-K



    - with the 0.5 (GAU-21)
      - a keybind to push the gun horizontally to the side on the outside

GAU21 Hor. Folding	RAlt + RShift + Touche-Y

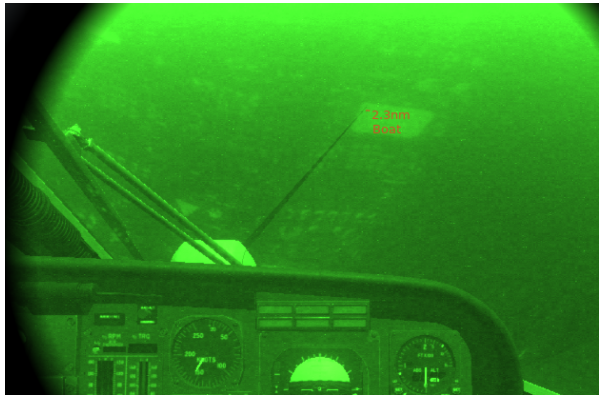
      - a keybind to place the gun vertically on its side on the outside

GAU21 Vert. Folding	RAlt + RCtrl + Touche-Y

• Part 7 – Armament

- **<u>AGM-114K Hellfire usage :</u>**
  - HellFire must be guided by a laser beam
  - You must first select a target, for this you must use the surface radar. Refer § Surface Radar Part 12
  - Once one and only one target is selected, you must setting the radar in Interception mode to assign it to the laser module
  - To turn on the laser beam, raise the FLIR's head (see your keybind)
  - The beam will activated only if three conditions are met:
    - Surface radar in 'Intercept' mode
    - Target distance < 5000yrd
    - FLIR turret raised (max. elevation)
  - Retracting the FLIR or exiting Intercept mode switches off the laser beam.
  - **With DCS version 2.9**, laser beam is no visibility, like in real life.
    However, you can see it with NVGs and by activating the inter on the operator console (cheated)
    or keybind Laser Beam Visible RCtrl + Touche-B

    Notifications on display:
  - If target is beyond range
  - When the laser is ON or OFF



N.B. The shot must be well aligned with the target and never too far above it. Train yourself !!!!

• Part 8 – Jettison

- **Jettisson your load :**
  - It is possible to jettison your load.
  - You can jettison all your load at the same time or choose to select which one you when to select
  - When pressing on your jettison or jettison select switch, you drop your load.

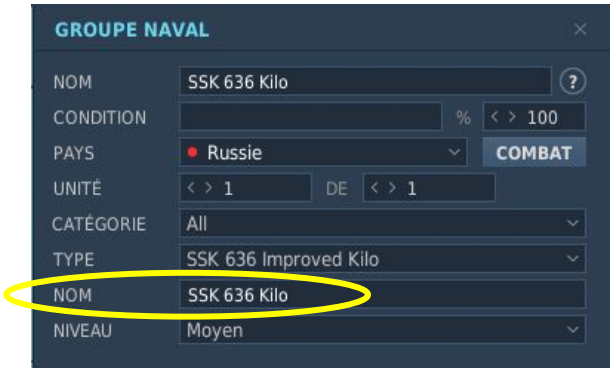
- **Keybind :**
  - Jettison all cover and arm :
    - ‘RAlt' + ‘A' = ‘Jettison all Cover - OPEN/CLOSE’
    - ‘RCtrl' + ‘A' = ‘Jettison All Switch’
  - Jettison selection cover, arm and selection :
    - ‘RAlt' + ‘S' = ‘Jettison Select. Cover - OPEN/CLOSE’
    - ‘RCtrl' + ‘S' = ‘Jettison Select. Switch’
    - ‘RCtrl' + ‘Num -' = ‘Jettison Selector Dec.’
    - ‘RCtrl' + ‘Num +' = ‘Jettison Selector Inc.’

Action	Catégorie	Keyboard
Jettison All Cover - OPEN/CLOSE	Armements	RAlt + Touche-A
Jettison All Switch	Armements	RCtrl + Touche-A
Jettison Select. Cover - OPEN/CLOSE	Armements	RAlt + Touche-S
Jettison Select. Switch	Armements	RCtrl + Touche-S
Jettison Selector Dec.	Armements	RCtrl + Num -
Jettison Selector Inc.	Armements	RCtrl + Num +

• Part 9 – Mission Edition

- **Templates Submarine hunting :**
  - New Templates v3.0 have been created in order for you to have directly the activation of the scripts.
  - They have been placed in the folder : MH-60R/missions/template/
  - The following lines must not be deleted under any circumstances or the script will work properly
  - All modern maps are available
    - Caucasus
    - Syria
    - Mariana
    - Falklands

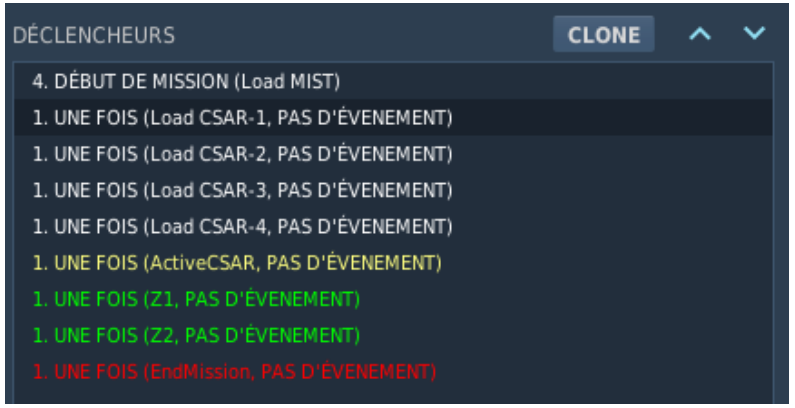
- **Recommendation :**
  - The name of your ships or submarine will be the one which will be displayed by the detection system. We recommend you to use the vessel type
  - Your pilot name must be **MH-60R-1** in accordance with the script loaded above **ASW_1.lua**



- **Mission :**
  - A mission “Submarine hunting” v3.0 is available in folder : MH-60R/missions.

• Part 9 – Mission Edition

- **Template CSAR :**
  - The CSAR script MultiPlayer(not MultiCrew) is functional.
  - All CSAR commands are now integrated into scripts, with only the first 5 lines (white) required.
  - One template has been created in order for you to have directly the activation of the scripts.
  - It has been placed in the folder :
    MH-60R/missions/Templates/Template_CSAR_Caucasus.miz
  - Only 1 map is available
    - Caucasus



- **Recommendation :**
  - Your pilot name must be **MH-60R-1 to 4** in accordance with the script loaded above **CSAR_1 to 4.lua**
  - The name of your rescued pilot must contain "**Pilot**"

- **Mission :**
  - You will see in the next page the different phase of a mission.

• Part 9 – Mission Edition

CSAR mission description 1/4:

- **Coaching :**
  - If the diver is dropped or winch down aimlessly, he enters into training mode.
  - It will swim in a random direction for a distance of about 547 yrds. when it stops it goes into a waiting position. (Arm extended upwards).
  - When he is in water, a notification indicates the direction he is taking (this could be useful to find it, if you do not want to use the map).
  - If for some reason (event in a mission) it needs to be picked up, just hover close enough and he will pass into waiting position.
  - A notification indicates when the training is finished and to pick it up or if he has been stopped to reup him.
  - It's up to you to search the ocean to find it!!

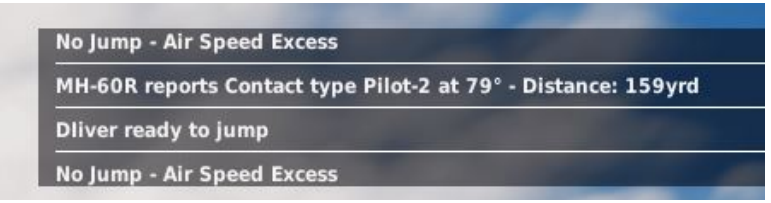
- **Rescue :**
  - As in the mission of the previous version, an ejected pilot or several can be rescued.
  - When the helicopter is near the ejected pilot and gets the information, the diver can be dropped or winch down.
  - **Nota :**
    - Only the number of rescues depends on the number of pilots in the water at the start of the mission. (the name must include at least the word 'Pilot').
    - The pilots of the two coalitions can be mixed, preferably the distance between the pilots must be at least 200 yrds.

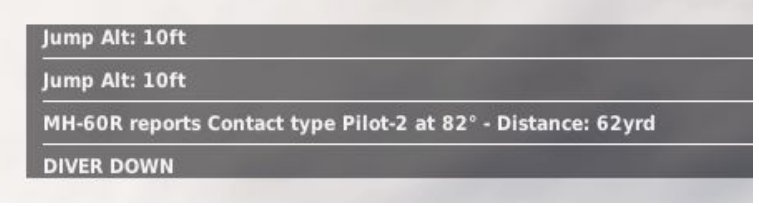
• Part 9 – Mission Edition

CSAR mission description 2/4:

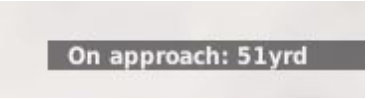
- When the helicopter will be in a radius of 218 yard around the pilot, you will get a message providing the direction and distance to him (detection phase).

- Open the door and activate the “Diver Drop”.
- Diver will seat on the helicopter door and wait the good condition to jump.
- You will get information concerning your speed and altitude .
- When condition are matched , the diver will jump automatically and will swim to the pilot to be rescued. (only if you have previously detected him).
- You can also use the harness to descent the diver into water.





- You will get information from the diver concerning his distance to rejoin the pilot.



- When done, you will get the message “Pilot Secured” “ Come Back” and get the information of the pilot and diver position (direction and distance) from your helicopter.

• Part 9 – Mission Edition

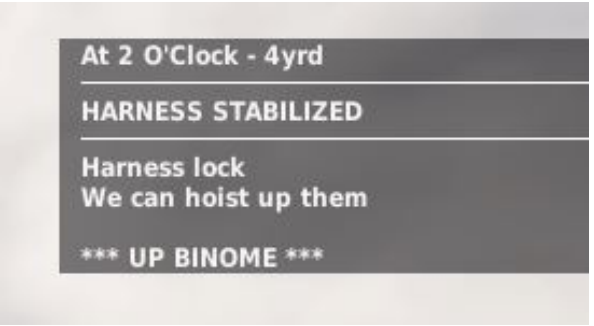
CSAR mission description 3/4:

- You can “Auto-down” now the harness and rejoin the diver and pilot. Information concerning the direction and distance with them will remain displayed.

- **Please note that since this CSAR version, the rescue no longer goes up automatically, stabilized harness info is displayed every 2".**

- **The reup order will be displayed as soon as the conditions are met, then activate the keybind 'Winch - Auto Up Rescue' for the single-pilot lift and 'Winch - Auto Up Pair' for the pair.**

- When they will be on board, you will get a message that your mission is a success and you can return to your base. Congratulation !!!!



• Part 9 – Mission Edition

CSAR mission description 4/4:

Ground capacity

- Add a 3D model of 'EjectedPilot' for CSAR operations above water or ground.
- find it in Ground Units => Infantry => *EjectedPilot or *EjectedPilot with MS2000
- Try the mission : \Mods\aircraft\MH-60R\Missions\Single\CSAR_Caucasus_on_Ground.miz
- As with previous versions, the word 'Pilot' must be in the name of the unit to be rescued.
- As soon as the harness is lowered, approach information is displayed for recovery of the unit.

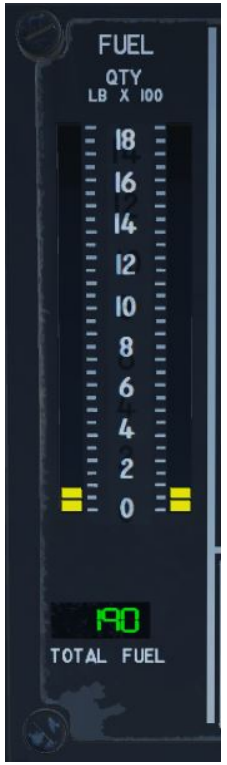
- Please note that since this CSAR version, the rescue no longer goes up automatically.
- ‘Stabilized harness’ info is displayed every 2" if the harness is in good condition.
- The reup order will be displayed as soon as the conditions are met, then activate the keybind **'Winch - Auto Up Rescue'**, for the single-pilot lift and **'Winch - Auto Up Pair'** for the pair.
- If the lifting action is not performed quickly and a condition is no longer met, **the harness will lift empty and the rescue will remain on the ground.**

• Part 9 – Mission Edition

- **<u>Mission creator :</u>** With the MH-60R you get new available objects for your missions:
  - **STATIC Unit**
    -> *Category Personnel*
    > *Diver
  - **GROUND Units**
    -> *Category INFANTRY* *also enable on ship*
    > *Ejected Pilot
    > *Ejected Pilot with MS2000
    -> *Category UNARMED*
    > *Strobo MS2000
- **NAVAL Units** ¤ Equipped with a glow stick that lights up at night
  -> *Category Support*
  -> *Strobo MS2000
  -> *Diver & Rescue ¤
  -> *Diver SAR ¤
  -> *Mark 54 Torpedo - Reserved for script ASW
  -> *Rescue Pilot ¤
  -> *Rescue Pilot with MS2000
  -> *Sonobuoy - Reserved for script ASW
  -> *Strobo MS2000
  -> *Swimmer SAR ¤

• Part 10 – Fuel management

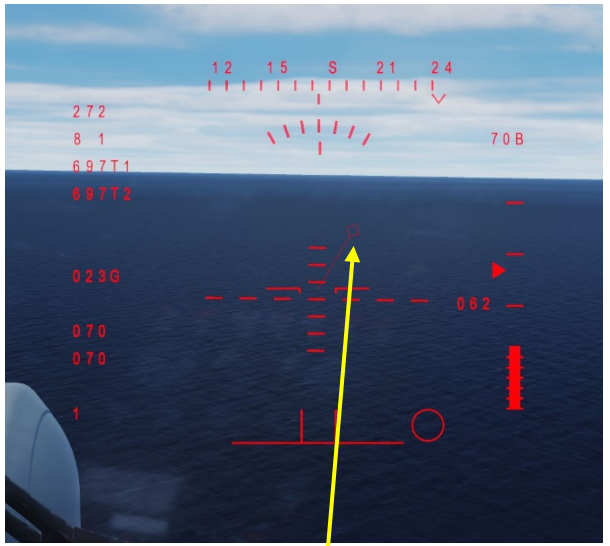
- **MH-60R fuel management :**
  - Fuel quantity in the main tanks is now 590 gallons
  - When quantity goes down 530 lbs the light turn yellow
  - It is now possible to transfer from the auxiliary tanks to the main tanks.
- **Keybind :**
  - No default keybind
- **MH-60R fuel transfert from auxiliary tanks to main tanks :**
  - In order to activate the automatic transfert :
    - 1) Select the XFER mode selector to AUTO
    - 2) Select the RIGHT or LEFT auxiliary tank
  - Manual transfert is not working :



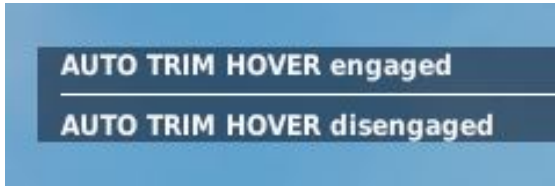
• Part 11 – Auto-Hover

- **<u>MH-60R Auto-Hover :</u>**
  - The purpose of this function is to maintain the attitude of the helicopter when this one is previously set in stable condition.
  - This function have limited action and any action on the command will cancel the auto-hover function.
  - This function can evolve along the time and the aircraft can go to a crash if you don't retake the control.

  - **Process:**
    - First reset the "Cyclic trim reset"
    - Put manually your helicopter in hover : Velocity Vector in the center and no variation of altitude
    - Activate the "Cyclic trim release"
    - Your helicopter must remain in hover if not apply correction.
    - When completely stable without any action on the command, Activate the "Auto Hover ON/OFF"
    - When activated a message will be displayed "AUTO TRIM HOVER engaged"
    - If the speed increase, the function will be automatically cancelled and you will get a message ""AUTO TRIM HOVER disengaged"



Velocity Vector



• Part 12 – Operator Console

Overview (Seat Key 3)

Laser Beam visibility (page 28)

Surface Radar Controls Panel (page 40)

Length Unrolled Sonar Cable (page 13)

Sonobuoy Depth (page 10)

Sonobuoy & Sonar Panel (idem Cockpit Panel) (page 10 & 14)

• Part 13 – Surface Radar

- **Radar operation :**
  - When the radar is switched ON, all Sea or Ground units according to the 'Cat.' button and according to the 'Coal.' button are visible on the F10 map within a maximum radius of 6 NM with the x1 position of the button Range.
  - Maximize or minimize the Range and Sector of the radar to isolate the unit. You can use the mouse wheel for these buttons

    'LAlt' + 'LShift' + 'S' = 'Sonar/Radar Range – Incr.'
    'LAlt' + 'LCtrl' + 'S' = 'Sonar/Radar Range – Decr.'
    'RAlt' + 'RShift' + 'R' = 'Sonar/Radar Sector - Incr.'
    'RAlt' + 'RCtrl' + 'R' = 'Sonar/Radar Sector - Decr.'

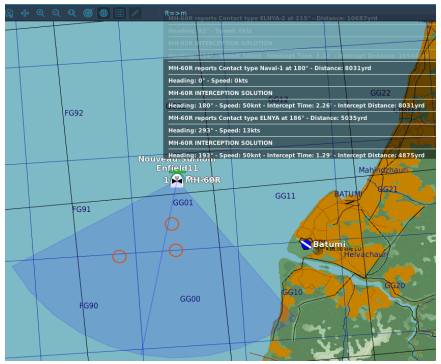
  - **Int.** mode, intercept info will be displayed.
  - **Sol.** mode, the infos of torpedo fire solution is displayed as for the diving sonar, but only for surface ships.

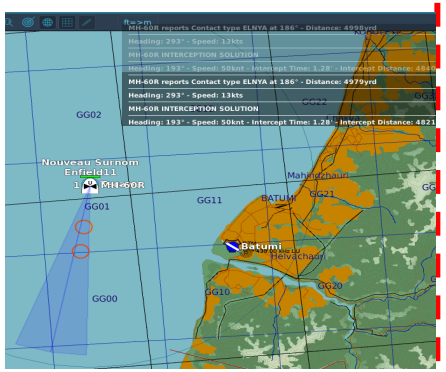
    ** REMINDER ** Firing solutions are only available and displayed if at least Left Inboard or Right Inboard switch is ON.

- You can use the buttons on the Sonar Console or keybinds for all buttons.
- The display on the console screen is just to indicate that the radar is ON.
- In Solution Fire mode, the control stick is up
- Radar and Sonar cannot be used simultaneously

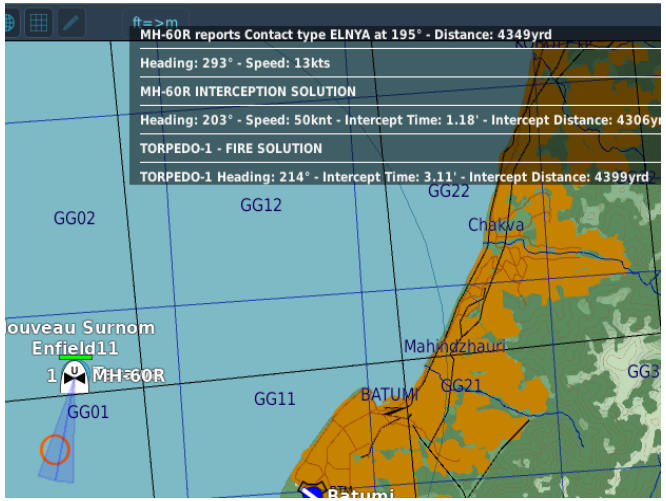
• Part 13 – Surface Radar

- **Radar modes :**
  - Keybind
    'LAlt' + 'LCtrl' + 'R' = 'OFF/ON/INTERCEPT/SOLUTION'
  - Radar ON
    - Display only a red circle per unit on the F10 Map
    - The default detection sector setting is 360°
  - INTERCEPT mode
    - Display the information of unit displayed by a red circle
    - The default detection sector setting is 100°, axed on the heading of the MH-60R.
    - <u>This mode should be used to select a target and use the laser</u>
    - ** refer § 'Armament' AGM-114K Hellfire section Part 7
  - SOLUTION mode
    - If a torpedo is selected, display the information of solution and
      if avalaible you can launch the torpedo
    - The default detection sector setting is 20°, axed on the heading of the MH-60R
      ** REMINDER ** the launch angle cannot exceed 30°





Reduction of the detection angle and range



• Part 13 – Surface Radar

- **Radar rotation :**

See : VIDEO

The radar sector can be oriented in relation to the helicopter's heading with keybind or the grey button on the Radar console

- Keybind
  'LAlt' + 'RShift' + 'R' = 'Radar - Rotation – Right'
  'LAlt' + 'RCtrl' + 'R' = 'Radar - Rotation - Left'

- Reset position
  Return into axis of helico with the 'Reset'
  'RAlt' + 'RShift' + 'Rctrl' + 'R' = 'Radar - Rotation – Reset'

- Lock Target
  The sector can be locked onto a target, regardless of variations in the chopper's heading.
  When the button (toogle) is pressed, the 'Target' LED lights up and displays 'LOCK'.

• Part 13 – Surface Radar

- **Radar usage:**

  - When the FIRE solution is switched ON (see keybinds), the infos of solution is displayed as for the diving sonar.
  - The location of the target will be provided by a red circle when the target is detected.
  - The information will be refreshed in the cockpit and on the map every 1 second.
  - You can now adjust the detection distance (see keybinds), by decreasing the range you can isolate the desired target to have a suitable firing solution. A zone around the MH-60R will indicate the range on the map.

- **Range modes :** x1 – x10

  In x1 mode, distance units are in Yards, maximum range 6NM.

  In x10 mode, distance units are in NM, maximum range 60NM.

- **Cat. modes :** Sea – Grd

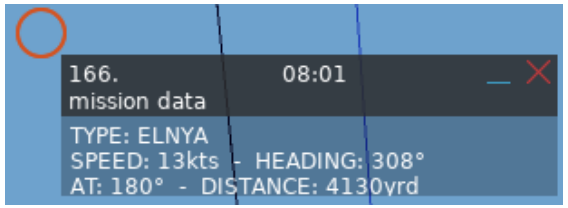
  In Sea mode, only SHIP units are displayed

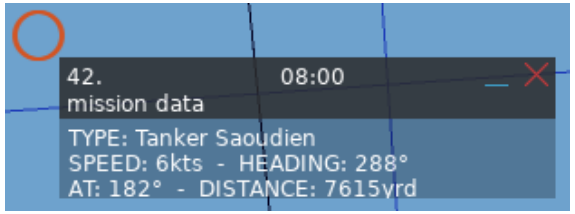
  In Grd mode, only Ground units are displayed

• Part 13 – Surface Radar

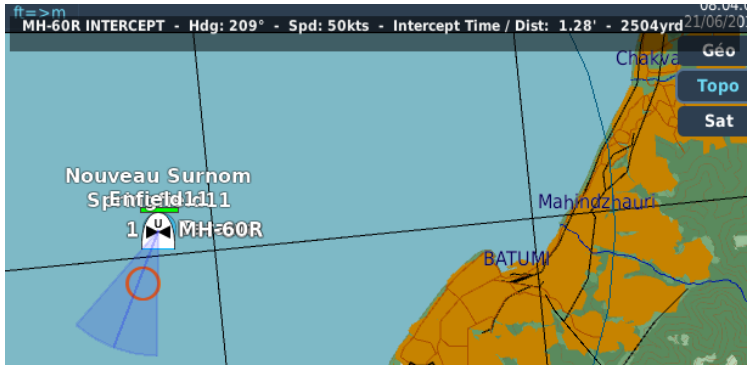
- **Selection modes :** 'LCtrl' + 'LShift' + 'S' = 'ALL/NEUTRAL/FRIENDLY/ENEMY'
  - On F10 Map, display is dependent on Surface Radar settings
    - ALL => All targets detected are displayed
    - NEUTRAL => Only neutral target are displayed
    - FRIENDLY => Only our coalition is displayed
    - ENEMY => Only enemy coalition is displayed

- **Target Data :**
  - In order to lighten the notifications during the surface radar is ON , the informations of the detected ships are displayed in the marks on the F10 Map



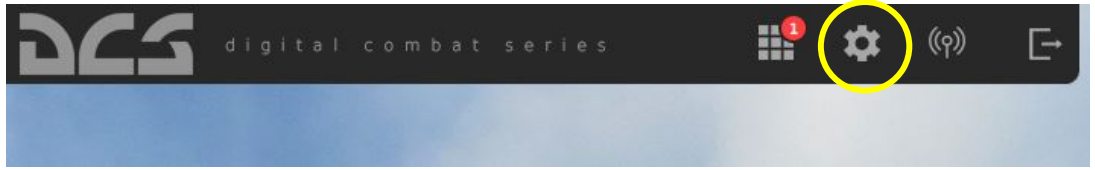


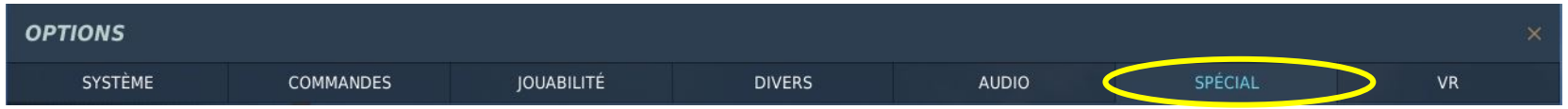
In Intercept and Solution mode, information remains in the message area to maintain real-time vision.



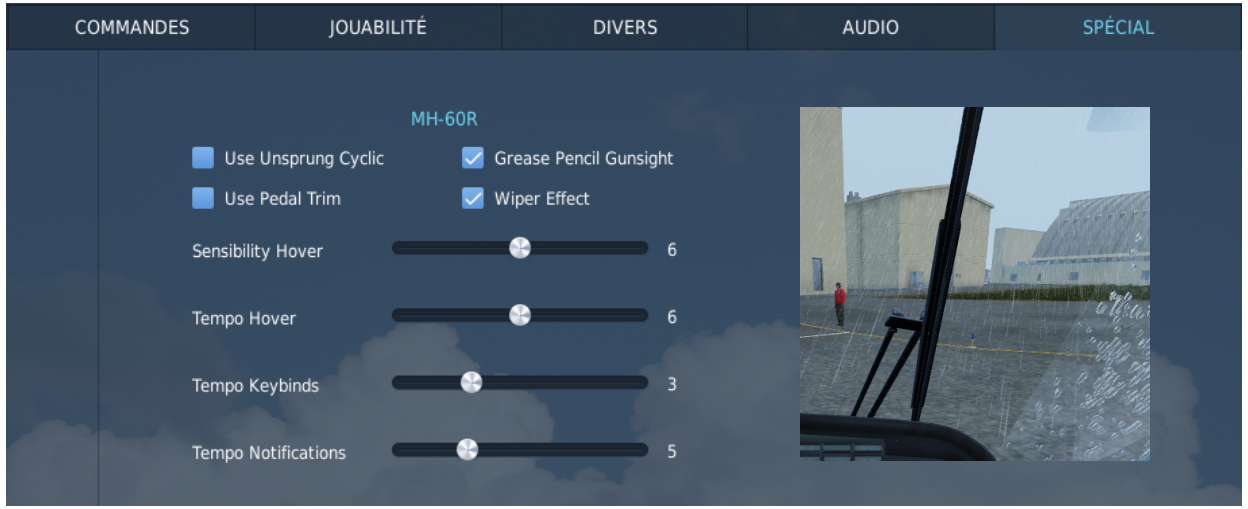
• Part 14 – MH-60R Customization

- **MH-60R parameters adjustment :**
  - You will find these on your DCS – Parameters - special – MH-60R



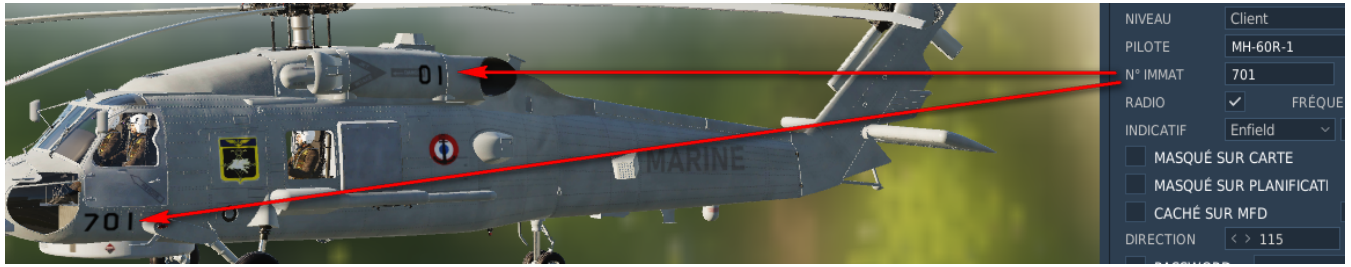


  - It is possible to adjust several parameters.
    - Select or not the use of an Unsprung Cyclic
    - Select or not the use of Pedal Trim
    - Select the type of Gunsight (Circle or Grease pencil)
    - Select or not the effect of wipers on windshield
    - Select the variation of max altitude variation to declare the helicopter in hover condition
    - Select the duration of helicopter in hover condition to declare the stabilized condition
    - Select the duration of the message associated to Keybind usage from 0 to 10 seconds (0= no display)
    - Select the duration of notifications from 3 to 10 seconds



• Part 14 – MH-60R Customization

- **MH-60R Liveries :**
  - Helicopter numbering is dynamic, **now the numbers on the doors have 3 digits**
  - You can choose the part of the fuselage where the N°Immat will be displayed
    - Doors [2024] = 0.3
    - Engines [2024] = 0.6
    - Both [2024] = 0
    - None [2024] = 1



The option will be located in the description.lua of each livery in the 'custom_args' section such as :

```
custom_args = {
[2024] = 0.3,
}
```

Other args are available for static model liveries.

```
[8] = 0.0      -- UnFolded Blades
     1.0       -- Folded    Blades

[13] = 0.0     -- UnFolded Stab Right
     1.0       -- Folded    Stab Right

[126] = 0.5    -- Copilot visibility
     -1.0      -- No Copilot

[10] = 0.0     -- UnFolded Tail
     0.98      -- Folded    Tail

[14] = 0.0     -- UnFolded Stabilisator
     1.0       -- Folded    Stabilisator

[127] = 0.5    -- Operator visibility
     -1.0      -- No Operator

[12] = 0.0     -- UnFolded Stab Left
     1.0       -- Folded    Stab Left

[125] = 0.5    -- Pilot visibility
     -1.0      -- No Pilot

[7] = 0.0      -- MH-60R radars visibility (also available in 'player')
     1.0       -- No Radar
```

• Part 14 – MH-60R Customization

- **MH-60R Liveries :**

-

See : Unfolding Video

- The 'UnFolding' function is available from the start of the mission

  This requires a COLD START, otherwise the 'Folding' mode will be cancelled

- The choice is made in the mission's 'Options' menu.

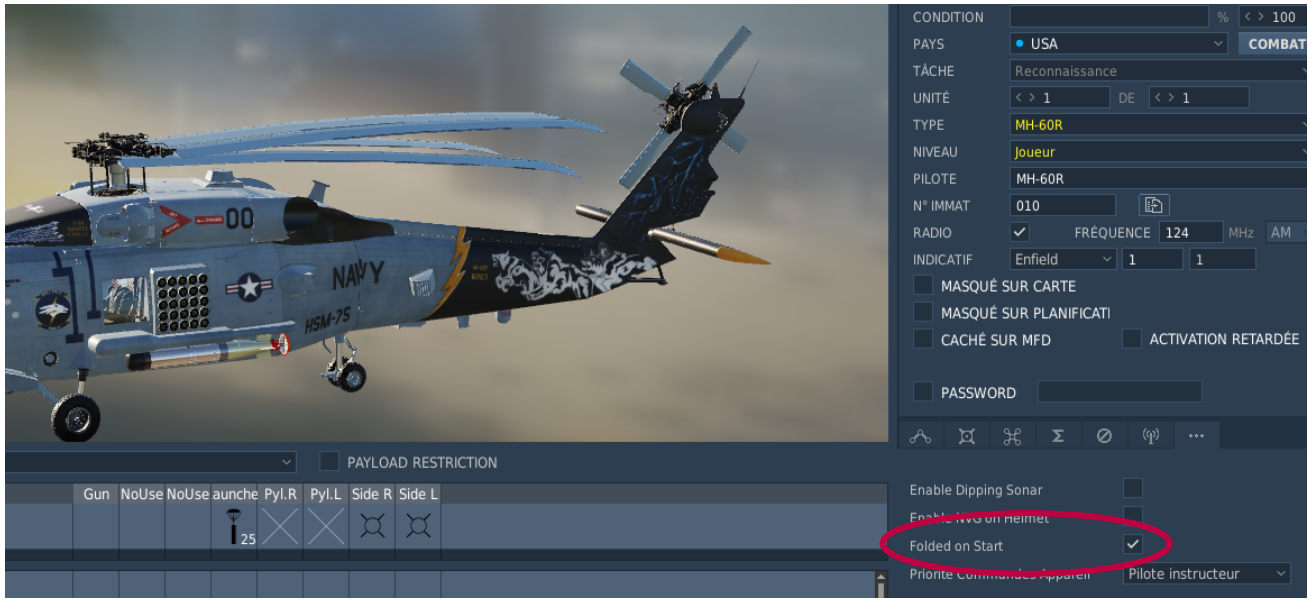
- In ME, only the chopper's blades will fold, but the whole unit will be functional in the mission.

See : Folding Video

- The 'Folding' function is available at a complete stop rotor

  There is no button or switch, only via Keybind
  BATT Switch must be ON
  ENG1 and ENG2 must be switch OFF

  'RShift' + 'R' = 'Rotors UnFolding'
  'RAlt' + 'R' = 'Rotors Folding'



• Part 15 – MH-60R and Multiplayer

- **MH-60R and multiplayer :**
  - ASW and CSAR Mutliplayer mission (several MH-60R in the same mission, not MultiCrew) :
    - Now, it is possible to have the benefit of the functionality of one helicopter with the others (sonobuoy, sonar, torpedo, surface radar)
    - Each helicopter must be named MH-60R-1, MH-60R-2, MH-60R-3, MH-60R-4. Same for the group of each helicopter.
    - In the ME, for each helicopter, it is necessary to associate the corresponding script, they are in the file \MH-60R\Script
      - MH-60R-1 => ASW_1_depth.lua or CSAR_1.lua
      - MH-60R-2 => ASW_2_depth.lua or CSAR_2.lua
      - MH-60R-3 => ASW_3_depth.lua or CSAR_3.lua
      - MH-60R-4 => ASW_4_depth.lua or CSAR_4.lua
    - Refer templates files in the folder \MH-60R\Missions\Template Naval Operation\ or \MH-60R\Missions\Template CSAR\
    - **ATTENTION - ASW and CSAR scripts cannot be in the same mission**

  - Multicrew operation :
    - Only the player who is hosting the mission have the control of the helicopter commands (sonar, armament, sonobuoy ……)
    - It is recommended that this player be the pilot
    - Gunner seat is fully functional
  - Nota :
    - Work in progress to improve the possible interaction of the other seat (Copilot, Sonar Operator , Winch Operator)

• Part 15 – MH-60R and Multiplayer

- **<u>MH-60R display issue multiplayer :</u>**

Improvement of weapon and loading display in multiplayer

- In order for everybody to have a correct display of the weapons and loading, a patch of the DCS game and the MH-60R is necessary :
    - Files are included in the “MP Patches” folder inside the MH-60R folder.
    - To install it, you have to:
- Copy and paste the contain of the “DCS Patch MP_v2” in your main DSC **game** folder
- Copy and paste the contain of the “MR-60R Patch MP_v2” in your DCS **Save Game** folder
- We recommend you to use OVGME tool to do these installations, the *.zip are compatible.
- **WARNING :** If you patch DCS, you must patch the Mod otherwise DCS will not start
    - Patches need to be made for each update :
- After a DCS update, use the 'DCS Patch MP_v2.zip' patch
- After a Mod update, use the 'MR-60R Patch MP_v2.zip' patch after Mod installation

• Annexe

<u>ASW Explanations :</u> (Thanks to ryu1940 for its development aid)

THERMAL LAYER

In the ASW_Depth script the thermal layer is a surface layer where water temperature from the surface is constant down to a randomly defined depth. Surface layers occur in real life based on environmental factors and impact ASW operations. In DCS the depth of this layer is defined randomly at the start of a mission.

Sensor range is based on sensor and target depths in relation to the surface layer. When a submarine is in the surface layer and the sensor, whether it be a sonobuoy or dipping sonar, is in the layer as well, the normal detection range of the sensor will experience a potential increase.

If the submarine is below the surface layer and the sensor, whether it be a sonobuoy or dipping sonar, is in the surface layer, the detection range will suffer a potential range decrease from normal detection ranges. This simulates the scattering and refraction of the sound rays passing through the layer and its negative effects to contact detection.

If the submarine is in the surface layer and the sensor, whether it be a sonobuoy or dipping sonar, is below the surface layer, the detection range will suffer a potential range decrease from normal detection ranges.

If the submarine is below the surface layer and the sensor, whether it be a sonobuoy or dipping sonar, is below the surface layer as well, the normal detection range does not change.

Range calculations for sonobuoys, dipping sonar, and acoustic torpedoes based on the layer depth are available via the F10 radio menu.

SONOBUOYS

The sonobuoys are modeled after the AN/SQQ-53 DIFAR sonobuoys and can be set to four different depth settings: 90ft, 200ft, 400ft, 1000ft.

The depth setting must be made before the sonobuoy is released and is done so by using the rotary knob on the sonar operator's console.

As a sonar operator it will be your responsibility to analyze the surface layer information and drop sonobuoys with depth settings to place the sonobuoy in or under the surface layer depending on where you believe the submarine to be and maximize detection ranges.

• Annexe

ASW Explanations :

The AN/SQQ-53 DIFAR sonobuoys are passive directional sonobuoys and as such are capable of delivering Doppler information to the sonar operator. During submarine detection, the sonar operator analyzes acoustic signals received by the sonobuoy and determines if a contact is ‘up Doppler’ or ‘down Doppler’. Doppler indicates whether the contact is approaching or moving away from the sonobuoy. If a contact is moving towards the sonobuoy, you will receive an up Doppler notification from that sonobuoy. If a contact is moving away from a sonobuoy, you will receive a down Doppler notification from that sonobuoy. Use this Doppler information to help you estimate a basic course of the contact to aid in more sonobuoy placement while trying to maintain a track.

The sonobuoys have a directional 20 degree bearing resolution on any acoustically held contact. The sonobuoys automatically begin detection after 30" in water entry if a contact is in range.

Unnecessary sonobuoys can be sent a scuttle command via the F10 radio menu. You may want to scuttle down Doppler sonobuoys or sonobuoys that are out of detection range.

Displaying different types of contacts held by the sonobuoy is done via the sonar operator console. When the 'Surface/Off/Immersion' rotary sonobuoy switch is in the OFF position, it switches off all detection from being displayed on the F10 map.

When the ‘Surface/Off/Immersion’ rotary sonobuoy switch is in the Surface position, it displays surface contacts on the F10 map detected by the sonobuoys.

When the ‘Surface/Off/Immersion’ rotary sonobuoy switch is in the Immersion position, it displays subsurface contacts on the F10 map detected by the sonobuoys.

To turn off receiving sonobuoy contact messages set the Sonar switch to 'Master ON'. Turning on the dipping sonar system will disable any incoming sonobuoy messages but detection will still be active and displayed graphically at the F10 map.

DIPPING SONAR

The MH-60R is equipped with the AN/AQS-22 ALFS (Airborne Low Frequency Sonar).

The sonar must be deployed at a maximum altitude of 75 feet.

The dipping sonar can be deployed to user commanded depths.

• Annexe

ASW Explanations :

The depth of the sonar sensor is adjustable down to 800ft and is done at the sonar operator console. The sonar operator console also features

a cable length counter displaying sonar cable length that has been deployed.

The dipping sonar can be deployed safely under 30kts. Sonar contact is only held on the sensor if the speed is under 10kts and a contact is

within detection range. If the aircraft speed is above 30kts while the dipping sonar is deployed, the dipping sonar will be destroyed.

Once the dipping sonar is destroyed, it's is permanently lost for the rest of the mission.

TORPEDOES

Surface torpedo mechanics have not changed with the introduction of surface radar.

For subsurface torpedo engagements you no longer need a firing solution as was the case in previous versions. When a torpedo is dropped, the weapon will begin a circle search pattern. If a contact is detected by the torpedo during the search, it will then home in until it hits the target. The torpedo is capable of following maneuvering contacts and will intercept contacts even if their course is not completely stable.

The circle search pattern starts a clockwise spiral with an initial diameter of 500 yards. Each semicircle of distance traveled will increase the diameter by 500 yards. The weapon will continue to do this growing spiral pattern until it runs out a total length of 10,000 yards. At about every 56 yards a position tick of the torpedo is marked on the F10 map to help you track its progress.

It is important to keep in mind that the torpedoes are unable to discriminate friend from foe and from civilian vessels. The torpedoes act similar to a heat seeking Fox-2 weapon with aircraft when they acquire a target in that regard.

Like sonobuoys and the dipping sonar, the torpedo's detection range is affected by the surface layer and contact positioning. Detection range of the torpedo is displayed under 'Info' in the F10 radio menu.

Once a submarine is hit by a torpedo a message will be displayed indicating whether a second weapon will be needed for re-attack or if the hit was enough to destroy the vessel.

Fly Safe