

# LuftWolf and Amizaur's Weapons and Sensors Realism Mod v3.08

For DW 1.04 Build 378

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## I. WEAPONS

### 1. 2-stage weapons:

#### **Mk60 CAPTOR:**

The Mk60 replaces the controllable and AI P3C-ORION's 2000 lb mines. The CAPTOR is an encapsulated Mk46 torpedo mine with a passive sensor array equal in sensitivity to the VLAD sonobuoy. When laid, the mine goes to its preset depth (max 3000ft). The available depth on the P-3 interface is:

Surface 90ft  
Shallow 400ft  
Deep 1000ft  
Bottom

The Bottom option will place the mine on the bottom or at its max depth of 3000ft. The mine is able to classify between hostile and friendly targets, and will only engage HOSTILE SUBMARINES when the ROE for the scenario is set to WAR. When a valid target is detected within 4000m, the weapon will fire an Mk46 torpedo using a Snake pattern in the direction of the target and then shutdown shortly after. Note, due to the insensitivity of the CAPTOR passive sonar, most modern SSN and SSK detections/engagements at patrol speed occur under 4000m. In the loadout screen you'll still see them as 2000 lb mines but in fact they are Mk60 Captor mines.

#### **SS-N-27 ASM AND KLUB 3M-54E ASCM:**

This weapon now properly simulates the reported operation of this weapon in the real world. The first stage is a cruise missile with range 200km/108nm and speed 500kts and a radar seeker. To use the missile, set the enable point as usual. When the missile enables and detects a target, it will fire the second stage of the missile, which is a supersonic ASM with speed 2.5 mach and range 24km/13nm. The first stage will often remain in the air and act as a decoy for SAM's before settling into the ocean.

**REM:** The kills caused by 2-stage weapons are not listed in the mission status screen and debrief file!

### 2. Torpedoes:

## **Torpedo Performance**

- 1) The search pattern of snaking torpedoes has been reduced from 90 degrees forward arc to 60 degrees forward arc; AI torpedoes fired at submerged contacts will no longer strike nearby surface traffic by mistake; and the AI will now also sometimes fire torpedoes under layers at submerged targets.
- 2) Torpedoes now have seekers of unique quality and ping frequency, as previously all torpedoes were equally capable of detecting and tracking a target because they all shared a single seeker. The practical effect of this is to make high quality heavyweight torpedoes such as the ADCAP or UGST much more effective weapons individually than lightweight torpedoes such as the Mk50 or SUBROC's or older out of date torpedoes.
- 3) Torpedoes will now reliably begin searching again after losing their track or being spoofed by and burning through a countermeasure.
- 4) The torpedoes max ranges are dependant by their speed. The best results are reached at 45 kts for the Mk48 Adcap – 26.1 nm. At 25 kts his max range is about 19 nm.

## **Mk54 Torpedo**

This weapon replaces the Mk46 for all playable platforms, as well as all American platforms equipped originally with Mk46 torpedoes (the ASROC is still an Mk46). All other non-American platforms retain the Mk46. The Mk54 is a Light Weight ASW torpedo with range 17km at speed 50kts with a max depth of 500m (less on the fire control presets), a seeker equivalent to the Mk50, and a lighter weight for better use in littoral conditions. Note: the load out and fire control screens will still show Mk46, but this weapon is actually the Mk54. The player FFG AI MH-60's will fire this weapon now on the third torpedo drop waypoint, with the two Mk50's being spent first.

## **65cm Torpedo**

The guidance sensor and doctrine changed to simulate 65-76 Wakehoming Hydrogen Peroxide-powered Torpedoes. All specifications have been left the same except guidance-following the wakehome doctrine now-and the wire has been removed. The wire-guidance option has been disabled in-game, but the fire-control graphics can't be changed, so you'll just have to remember that the A/P and search pattern buttons do nothing, and then the torpedo will continue in a straight line after it enables. Although you can launch the weapon deep, SET THE SEARCH DEPTH AT ~10m. This weapon is only for ASuW and cannot be targeted at submerged contacts.

## **53cm Torpedo**

The weapon has UGST specifications: Active/Passive Multipurpose Wireguided Torpedo, max range 50km at 50kph, with maximum depth 800m (less on fire-control preset panel) with 300kg warhead. This is now the primary multipurpose torpedo

armament for the Akula. If you have some 53cm's loaded into external tubes, they can not be wire guided.

### **Yu-8 Torpedo**

The SET-53E on the Chinese Kilos has been replaced with a hypothetical pirated version of the Russian USET-80, a multipurpose heavyweight torpedo with max range 16.7km at 45kts with a maximum depth of 475m and an active/passive seeker with quality between a Mk46 and a USET-80 (this weapon has yet not been added to the torpedo parameter guide included with the Mod).

### **53-65 Wakehoming Torpedo Family**

The minimum running depth of the torpedo has been set to -14m in order to ensure proper launch depth against surface targets. You can still launch the torpedo from as deeply as before. Also, this weapon can no longer be set to fire at submerged contacts in the fire control.

### **Shkval**

The MAD detonator on the Shkval has had its range reduced by half to 250m, as previously any shot within 500m of the target resulted in a kill, this makes it possible to evade one of these weapons if it is off target and proper evasion tactic is used. Also, this weapon seems to frequently damage targets as opposed to killing them outright, so be aware of this if you hear one detonate. The Shkval will now enable at the proper preset depth (DW 1.04 bug).

### **TEST-71-NK**

The Test-71-NK equipped on Chinese Kilos will now function exactly like the Test-71 except that it can be targeted at identified surface targets on the fire control or NAV map.

### **SS-N-16 Stallion/APR-3 Torpedo**

The APR-3 has replaced the APR-2E on Russian ASW aircraft and the SS-N-16 Stallion SUBROC torpedo payload, previously the UMGT-1 (the UMGT-1 remains the torpedo payload of the SS-N-15 Starfish). The APR-3 is a turbojet torpedo with a circle search pattern and a search speed of 40kts, and an active sensor equivalent to the MPT-1UE (the SS-N-27 payload). When the torpedo acquires a target, it will move to a homing speed of 68kts. The nominal max range of this weapon is 2.5nm, although in practice its effective range is closer to 1.5nm due to the speed vs. range curve in DW 1.04. Due to the speed of this weapon, its maneuvering ability is very limited at homing speed and it does not have a reattack capability. When the torpedo acquires and burns through a decoy or is outmaneuvered by its target, it will malfunction and run straight or go to the surface until it runs out of fuel.

### **SS-N-27 ASW/MPT-1UE Torpedo**

The missile range has been increased to 27nm and the torpedo payload has been changed to a MPT-1UE, which is a LWT with max range 13km at 45kts and max depth 650m.

### **SLMM and Mobile Mine**

Both of them are fixed to stop making noise after they have cut out their propulsion. Both mines will now actively try to find and hold their position, and will be reliably on target. This make them effective weapons within their constraints (300ft for SLMM and 450ft for Mobile mines, the range of their seekers, and the weapon will shutdown below 600ft, as these are shallow water weapons), which they were not in the stock game. Do not try to use them on a steep slope.

### **Countermeasures and Torpedoes**

The Non-Exploding on CM's Torpedo Mod by Amizaur has been restored to LWAMI. This overrides the .ini setting.

**NOTE:** *The ceiling preset on the fire control panels now have an additional function. By default, torpedoes will now no longer engage surface targets or surfaced submarines; this is the ASuW Safety On condition. If you wish to engage surface targets or a surfaced submarine, you can disable the ASuW Safety by setting the Ceiling to be 60ft (18m) or less, and the torpedoes will engage all detected targets. The Ceiling will also function as an absolute hard cap on the depth of the torpedo as before. The AI will use the ASuW Safety appropriately. Torpedoes fired from SUBROC'S and the CAPTOR'S has the ASuW Safety feature permanently enabled so these weapons will never engage surface ships.*

## **3. Missiles**

### **TLAM and LAM**

Now they have improved terrain following and reduced radar signatures to make them detectable at more reasonably short ranges. This same scaling has been applied to all other ASM's and SSM's, aside from SUBROCS; many anti-ship missiles will be harder to detect on radar than previously.

### **SLAM-ER**

SLAM-ER has enabled ASuW capability for the SLAM-ER equipped on the player P-3 Orion. The missile can now function in Strike mode and ASuW mode. To set the missile for Strike mode, use as described in the manual as before. Be sure to make the final waypoint directly over the target or the missile will likely cause only light damage. To use the missile in ASuW mode, set the two approach waypoints such that the missile is headed at the surface target as it approaches the final waypoint and **\*\*\*set the last waypoint over water\*\*\*** (this is how the missile is able to distinguish Strike mode and ASuW mode... if the last waypoint is over land, it will operate in strike mode, if it is over water, it will operate in ASuW mode). The last waypoint is the enable point for the weapon. At the enable point, the missile will drop

from its skimming altitude of 30ft to just above wave-level. At this point the weapon will enable, and if it immediately has a target, will stay low to the sea and home the target. If the missile does not immediately acquire a target, it will slowly climb back to search altitude of 30ft, and travel in a straight line, searching and homing using a radar seeker. The sequence described is a "stealth enable" feature that should improve the survivability of this weapon over the standard Harpoon. In this mode the weapon resembles a Harpoon with upgraded stealth, range, warhead, and waypoint capability. In terms of warhead power, two SLAM-ER hits will destroy a FFG7 OHP. The AI F/A-18 Hornet and P-3 Orion previously equipped with the SLAM-ER have been given an appropriate load of SLAM's for Strike capability and Harpoons for ASuW capability as the AI is not able to properly use the SLAM-ER.

### **Submarine Should Launched SAM's**

The seeker cones of all submarines launched SAM's have been limited so that the player must aim the launcher carefully at the target before firing to ensure a lock.

### **Spearfish**

Range increased by 10,000m to 32km

### **Maverick and Hellfire**

The range of the Maverick has been limited to 25km. Also, submarines have now been enabled as legitimate targets for Maverick and Hellfire missiles, meaning you no longer have to reclassify a visual contact before engaging a submarine that has popped up to fire a SAM. Also, these missiles will no longer damage submarines that are completely submerged, and will not home on submarines that are under periscope depth, meaning the anti-submarine missile cheat is removed. Also, the Hellfire Strike equipped on the player FFG MH60 can now target surface ships. Hellfire II-The fire and forget version of the updated Hellfire has replaced the original Hellfire. The player MH60 can fire all four at the same time and the AI can now fire two at a time (because of engine limitations).

### **FFG SM-2**

The Fire Control radars on the FFG have been changed so that it is no longer possible to fire SM-2's over the horizon at distant targets, there must now be a valid light of sight between the Fire Control Radar and the target. Also, for the weapon to be effective, the FCR's should only be directed in the weapons control station at targets generated by the air or surface search radars, because both radar systems are needed to effectively guide the missile.

## **II. SENSORS**

All active and passive sonar systems in the game, both for the AI and human platforms, have been scaled in terms of their projected real world effectiveness. The Passive and Active noise levels of all platforms in the game have also been completely reworked. Platforms now have Sound vs. Speed curves that are

appropriate for their class and quality. Further, all playable platforms have unique Sound vs. Speed curves, giving them unique sound characteristics at each speed. (Note by LuftWolf: the Chinese Standard Kilos and Indian KLUB capable Standard Kilos have a starting PSL of 58 and then increase noise as other Kilos, to model the 877EKM version sold to those countries). The overall effect of these changes is to reduce the detection ranges against realistically quiet platforms at low speed, and increase the detection ranges against loud contacts (since all passive sonar hard-caps have been removed, you will no longer notice loud contacts suddenly appearing at high signal strength). All in all, the total sonar performance should be closer to what one would expect in all conditions against all kinds of contacts than the stock game.

The SeaWolf WAA hard cap has been set back to 15nm, so it will no longer register contacts over that range. However, the SW Hull array has been modified so it has a full forward view encompassing the entire coverage of the sphere sonar as well, although it is still treated as a separate array. This is based on the best available data regarding the SeaWolf sonar suite.

### **Sphere and Hull Arrays**

The sensitivity of the Sphere and Hull arrays has been increased relative to the Towed Array (to be clear, the TA is still much more sensitive in terms of long range performance) to better simulate their reported real world specifications. Also, the stern facing baffle of the Sphere has been increased to 120 degrees for active and passive modes, including the FFG and all AI platforms. It is not uncommon for contacts to show up on the broadband sphere before they show up on the narrowband sphere, and loud contacts will also show up more clearly on the sphere array broadband than the towed array broadband once both arrays have detected the contact. Expect to use the Sphere and Hull arrays more now to track and identify surface traffic and build situational awareness utilizing DEMON and TMA, and reserve the TA for finding and tracking those quiet hostile submarines or distant warships on narrowband.

*NOTE: Known Issue. It will be possible to see and hear contacts on the Sphere array before you can assign a Broadband tracker to them. You can immediately assign a narrowband tracker to all contacts on the sphere with a narrowband signature, although it is intended that generally contacts will be detected on the sphere broadband first. The broadband tracker issue is not intended, although it is present in stock DW as well, and the mod does not make it any worse in game play terms.*

The bearing error of all player submarine Sphere and Towed Array sonars has been increased.

### **UUV**

On the first place the anti-submarine capacity of the UUV has been taken away, except for cavitating or loud submarines like the Chinese Han and Xia. Regarding the TIW message from the UUV, this is a result of the DW engine, and the way the engine generates the TIW messages. It can't be really altered, even though the UUV is very quiet when stopped.

The UUV active sensor has been disabled completely (the passive sensor now has a 100 degree view on both sides rather than a 150 degree view on both sides as before, roughly the same dimensions as a submarine sphere sensor). The BB sound of the UUV has also been changed to a slightly different sound in the stock DW sound archive. The UUV now has a range of 17nm at 6kts and max speed of 20kts with a range at max speed of 2.7nm. The sensors are totally washed out at 8kts, with some washout above 6kts. The UUV launch conditions are the same as before: the submarine speed must be 4kts or less and the UUV launch speed is 4 kts. He remains at that speed until the player hits the ENABLE button, which acts as speed control for UUV. The PREENABLE button acts as depth control, having various conditions.

### **MAD and SAD**

The maximum depth at which an AI platform can detect a human sub is now a plausible 750ft (slightly less than reported in RL because the AI can detect contacts at any altitude). The max depth for human MAD is 1000ft and human SAD is 750ft.

### **Akula II Modified Gepard TA**

The array of the Gepard has been upgraded to hypothetical Pelamida II standards, with a max speed of +4kts over the original Pelamida and the in game name has been changed to "Pelamida II". The sensitivity has been left as it is. This array has also been assigned to the Oscar SSGN, to reflect the latest developments in the most funded Russian submarine projects. The practical effect of this is to give the Gepard and Oscar II class an effective tactical speed of 10kts without washout of the Sphere or Towed arrays.

### **688(i) Towed Arrays**

TB-23 has been added as starboard array. The port TB-16 washes out at ~20kts and the TB-23 washes out at around ~16kts. The sensitivity of the TB-23 has been set to be pretty much in the middle of the TB-16 and the TB-29.

### **Wakehoming Torpedo Sensor**

The range of the wakehoming sensor has been reduced, making it necessary to be sure to fire the weapon behind the target so that it makes contact with the targets wake, as in the stock game frontal wakehoming shots are far too effective. Surface targets can now lose the wake homers with sharp maneuvering once being followed by reducing speed to limit the size of their wake.

### **Sonobuoy Sensor Depths**

DIFAR 90/400ft  
DICASS 90/800ft  
VLAD-LOFAR 600/1200ft

The sonobuoys will not function in water depth that is shallower than their sensor depth.

### **Active Intercept**

The coverage of all active intercept systems has been increased to 360 degrees, so you will now hear torpedoes approaching from dead astern.

### **IR Signatures for Missiles**

IR signatures added for all missiles based on type, with a reasonable scaling from Sea-skimming cruise-missiles to supersonic, rocket powered anti-ship missiles. This now makes RAM SAM's effective against anti-ship missiles.

### **Cable Length Modifications**

The length of controllable platform cables has been changed to approximate real world lengths: SQR-19—5000ft, TB-16—2600ft, TB-23—2950ft, TB-29—3300ft, MH-60 Dipping Sonar—2550ft and Pelamida TA—2300/701m.

### **Active Decoys**

Active decoys now make passive noise detectable on broadband and narrowband sonar, with distinct sonar profile.

## **III. AI PERFORMANCE**

### **AI Sonar's**

The sensitivity of all AI sonar's has been increased significantly. This was necessary because the AI does not report any contacts until it has POSID on sonar, which is often at less than half the range a human, can, detect a contact given the same sonar parameters. The AI should perform much better now, but it may make some scenarios play out much differently than before.

Anti-missile performance has been improved in terms of last ditch missile fire against ASM's that have entered into CIWS range; all Russian platforms should now perform correctly in terms of missiles assigned to incoming vampires, particularly the Kirov. Also, the AI will now use chaff more liberally against missile threats.

Air-to-Air Missiles will no longer home on friendly aircraft to eliminate the rampant AI AAM fratricide problem; this was necessary because the AI does not use appropriate firing presets when using AAM's (DW 1.04 bug). It should now be possible to utilize fighters in scenarios without Blue-on-Blue overtly wrecking the chain of events.

The AI, when firing torpedoes, will now set them to utilize the layer properly, and will now set their torpedoes so they do not hit surface ships when they are not targeting a ship or shallow submarine.

AI helos will definitely no longer drag their active dipping sonar and they should not crash as frequently. Also, the AI MH60 when under player FFG control should no

longer go wandering off on its own and now launches with its radar OFF. A sensor has been added to AI ASW aircrafts that allows them to properly ID MAD contacts when they directly over fly them, since before they just helplessly over flew contacts until it got classed in some other way, or if the mission designer went through hoops to get them to class the targets.

AEGIS ships will now provide effective fleet defense against vampires up to 18-25nm and bogeys over 45nm, depending on the conditions and the target altitude. VLS equipped ships will fire multiple missile volleys at fast moving inbound targets that have escaped the first round of counter fire.

All platforms with sonar sensors now have effective sonar that is accurately modeled for their type and quality. Surface ships and submarines equipped with TA's are capable of using them to see under layers if they are above within distance and traveling slow enough. AI Surface TA's do not operate in water shallower than 75ft and AI submarine TA's do not function if there is less than 50ft of clearance under the submarine.

The submarines are now much more aggressive. AI captains will fire on hostile targets much sooner than previously, and will often wait until a target enters its evasion pattern for the first salvo before firing a follow up shot and clearing the datum.

Aircrafts and helicopters will actively classify and engage their own or sonobuoy tracks and MANUAL links from humans (allowing utilization of the link and AI for combined arms operations). Helos with dipping sonar will use their dipping sonar when prosecuting a track, with the process sometimes taking up to 10 minutes to complete a dip. At this time, the AI can be counted on to identify and prosecute manual human link contacts (if you have a datum for an unknown submarine you can link it and friendly ASW assets will attempt to find its exact location and classify it and then prosecute if it turns out to be hostile) as well as attack MAD contacts and sonobuoy contacts. As a side note, aircraft now properly drop submerged MAD and sonar contacts when they lose their track after some time, as before the simulator was having them update the contacts indefinitely, which is not a good thing.

## **IV. NOTES**

Note to MISSION DESIGNERS: If you chose to start the FFG Helo in the air at the start of the mission you MUST make it a playable platform as well (although you can tell players not to select it in the briefing for the MH60 if they select it). Also, for some reason, you cannot put the helo in the air with the Strike load out selected and I cannot fix this (it will revert to the ASuW configuration).

The speed of the SW has been reduced to 38 kts; 688i has been reduced to 33 kts and the speed of the Akula I Imp has been increased to 35 kts.

### **Advanced Sea skimming ASM's**

Variable decoy logic has been added to the most advanced sea-skimmers in the game, to make chaff 50% less effective for these missiles than for other missiles. The missiles improved by this change are the SLAM-ER, TASM, Harpoon, and SS-N-25. Chaff for these missiles will be 12.5% effective, whereas it is 25% effective against other missiles.

### **Visual, FLIR, and Night Vision Detection of Submerged Submarines**

Aircraft and helicopters are now able to see shallow submarines. The mean depth for vulnerability to detection is 80ft. The exact depth of detection varies by submarine, but for playable submarines 80ft should be considered the safety depth (because of depth drift). In good weather, SSK's and other small submarines are detected at approximately 1nm, with SSN's being roughly 1.25nm, and larger submarines like the Typhoon and Oscar II being as high as 1.75nm. In poor weather and at night, detection ranges drop considerably. The automatic lookouts for the player P-3 and MH60 are able to utilize this feature, and will call out near surface submarines like all other visual contacts. PLEASE NOTE: The visual detection range for the A/C's and helos on submarines is constant whether they are at PD or on the surface, and of course the ranges have been tuned for undersurface detection. This is unavoidable to implement this feature. For AI platforms, this will not matter, because the AI always has its radar on, but players should be aware of this when using the P-3 or MH60.

All submarine launched missiles will now give a verbal TIW message when detected on sonar. You will occasionally get TIW messages when functional missiles hit the water.

### **Playable Unit List**

Expanded playable hull list and "Eastern zed" playable submarine hull and class names has been added. Non-playable units have retained their NATO designations. Although the names of all the Kilos have been changed, their database Object ID remain the same so there should be no backward compatibility issues with old missions. Units added: tree Proj 971a/m; two Proj 971u; numerous Proj 877KM, the SSN23, three KLUB capable 636i for the PLAN.

AI the FFG7 OHP has been given the ability to have two SM-2's in the air at the same time, to reflect their real world and player counterpart capabilities, although keep in mind the launcher still reloads very slowly so the ship won't gain much benefit in close situations.

### **Player FFG+AI MH-60 Helicopter-DIPPING AND MAD CAPABILITY ENABLED**

The AI MH60 for the player FFG has been given dipping capability and sensors. To order the MH60 to dip, assign a Fly-To waypoint where you want the helo to conduct a dipping search. When the helo gets to the waypoint, the helicopter will stop and descend to 45ft, at which point its dipping sensors will become active. To stop the dipping procedure, assign another waypoint and the helo will go back up to speed and go back to 300ft. The helo has an active dipping sensor (which of course can be heard on submarine active intercept) set at 45ft of depth. The helo also has passive sensors set at 45ft, 600ft, and 1400ft. All sensors are active at the same time. To

compensate for this efficiency, the sensitivity of the AI sensors on the MH60 has been reduced. The MH60 also now has an effective MAD that can reliably detect submarines down to 750ft of water depth and 1200m around the helo. The range of this sensor is increased somewhat over what is reported in real life to compensate for the imprecise waypoint control in the ASTAC interface. You can now set the MH60 to perform MAD pattern searches on its own by assigning multiple Fly-To waypoints over a search area. The MH60 will fly to each waypoint with its MAD sensor active. In terms of employing torpedoes in ASW, it is recommended using Torpedo-Drop waypoints (as opposed to firing from the NavMap) while the Helo is under ship control to minimize interference with the autopilot. All three torpedoes, including the Mk54, can be dropped using waypoints, with the Mk54 being the last torpedo used after the two Mk50's. Now that you can set the helo to do MAD searches or repeatedly ping an area, it is recommended always keeping the helo on Ship control. When the FFG is in a mission under full AI control, the MH60R assigned to the FFG7 will not utilize its dipping sonar as often as other dipping equipped helos, as a consequence of compatibility changes necessary for the function with the ASTAC interface. Known Issue: The fully AI MH60 for the AI FFG sometimes displays an odd oscillation when pursuing a contact. It is largely only a cosmetic issue, although it sometimes slows down the MH60's time on target. To be clear, this issue is only present when the FFG is NOT player controlled.