POOK'S SAM PACK

Version: 4.3 | Release Date: 9/17/2016

OVERVIEW

This addon provides modern ***Integrated Air Defense Systems*** (IADS) of most of the major real-world IADS SAM and AAA systems:

- Missile performance and behavior based on published real-world data and video footage
- Counter-missile defense feature on ***Short Range Air Defense*** (SHORAD) Systems
- Anti-Radiation Missile (ARM) countermeasures available for all aircraft
- Automated SAM / AAA site creation via special units (capable of scripted and MP mission placement)

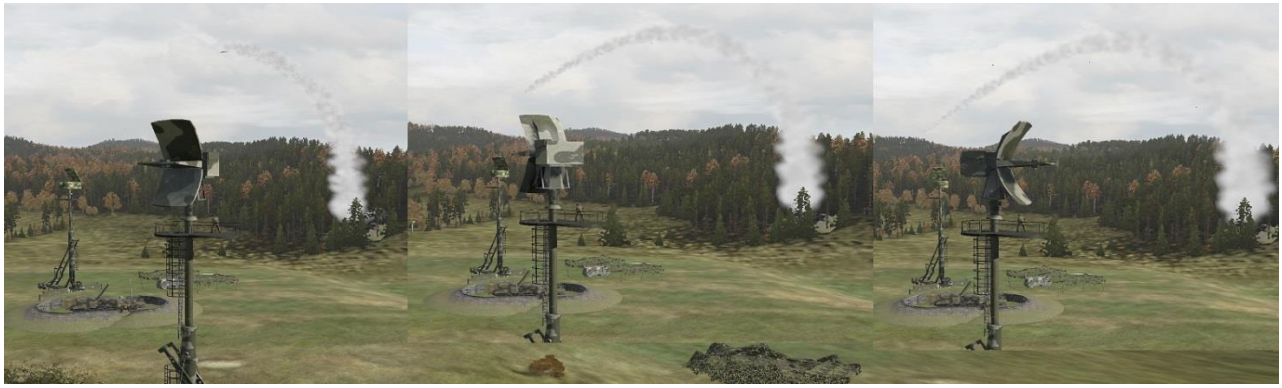
Starting with **v4.1**, the ***Arma3 version***, this addon is dependent only upon my camonets mod. CUP is now optional to accommodate incompatible non-CUP mods. See the Dependencies section below for further details!

SAM MISSILE AVOIDANCE

First, a word on the SAM's performance is warranted. The SAM systems in this addon are overall much more capable in performance and range than default missiles. Beyond Visual Range (BVR) engagements are likely with certain long-range systems. While they can be spoofed, the combination of features makes them much more formidable than the default systems. Take for example the S-300 (SA-10) or Patriot systems. These missiles CAN be spoofed, but it will extremely difficult. ***It is not impossible!***

Countermeasures and terrain-following flights will greatly enhance survivability since the SAM missile systems will NOT engage targets flying below a certain altitude. How low depends on the SAM system in question, but less than 200m is the typical limit. The trade-off to lower flight is that the site's SHORAD "point defense" systems will become much more viable. SHORAD systems are not controlled by the site's main radar; therefore they will still engage targets even if the site's central engagement radar is destroyed.

SAM's are normally radar guided; however in real life most are equipped with secondary optical guidance systems for use in an ECM-heavy environment where enemy ECM activity may hamper radar use, or when transmissions may alert the enemy to SAM activity. In-game, this is simulated by providing the missiles with manual guidance. SAM and AAA units may still be viable even after the host site radar has been destroyed. Direct-attack munitions such as rockets, CBU, etc. may be employed against these targets.



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CHANGELOG

v4.3: 9/17/2016

- FIX: Corrected missing Zeus entries for default factions
- FIX: Corrected SA19, PU12 editor categories
- FIX: MIM-23 site INIT script errors to address “shooter” errors
- FIX: Minor texture issue on SNR-75 radar
- FIX: Guide update: Added missing class names listing for KS12 site spawner units, KS12 PUAZO site spawner units, and SNR-75 units
- FIX: Optimized site cleanup script
- FIX: Damage textures for MIM-23, SA-3, and PU-12 units
- FIX: SA3 site radar embankment placement
- FIX: Incorrect AN/MPQ-64 damage animations
- IMPROVED: Enlarged 91N6 (SA-20 radar) model scale
- IMPROVED: Added clarification to ARM script instructions in the Guide
- NEW: VME PLA mod faction classes. Requires VME PLA to work. Only some systems have been included in this release. The alternative designations used by the PLA are listed in the Overview section of the Guide
- NEW: Added band/frequency settings to the static EW / Acquisition radars
- NEW: 64N6 (SA-20 radar) model based on A2 model from “Hand of Moscow”

v4.2: 9/6/2016

- FIX: 100 rnd Zu-23 magazines (2x 50-round belts). This appears to be correct based on numerous sources
- FIX: Corrected CUP US Army faction editor listing
- FIX: Spawner preview pic errors in 3D editor
- FIX: Site spawner script placement errors. Should address the “shooter” popup errors
- FIX: Minor SNR-125 radar 3D model issues
- IMPROVED: Site spawner scripts now clear launcher positions of all trees and terrain objects within a 40m diameter. This should improve engagement behavior
- IMPROVED: Site spawner scripts improved embankment placement
- IMPROVED: Added check for 3D editor within site spawner scripts. This should address the “shooter” script popup errors
- IMPROVED: Increased site “assignment” distance. This will allow manually-placed launchers to be controlled by the site within 600m of the radar control unit
- IMPROVED: Significantly improved indirect damage settings for proximity fused systems
- NEW: Added support for external ECM / Jamming scripts. Information contained in the Appendix at the end of the Guide

v4.1a: 8/21/2016

- FIX: Typo in the ARM commands for user missions: DOCUMENTATION FIX ONLY! PBO files are unchanged.

v4.1: 8/16/2016

- FIX: no entry 'config.bin/CfgVehicles.pook_SA10_spawnerW'
- FIX: no entry 'bin\config.bin/CfgVehicles/pook_SA2_Decoy.side'
- FIX: MAZ 7910 truck faction entries and cargo scripts
- FIX: ChDKZ SA-2 SAM site spawn errors
- FIX: Site cleanup script reliance upon now-deprecated BIS “HeliHEmpty” marker
- FIX: Syntax error for incomingRWR.sqf documentation
- FIX: Adding missing components to the geometry LODs of 5P85 (SA-10) launch vehicles
- FIX: S60 gunner “die” animations
- FIX: SA-11 / SA-17 missile flame effects
- FIX: Removed duplicate targeting data from SA-10, SA-20, NASANS, MIM-104 scripts
- FIX: Corrected ZU-23 magazine capacity to simulate real world values of 40 round belts
- FIX: Corrected ZSU-23-4 magazine capacity to simulate real world values of 200 rounds (4x 50rnd belts)
- FIX: Visual errors on generator support unit model
- FIX: SA-20 SHORAD spawn state (_aaa variable error)
- FIX: AAA proximity fuses now engage at target’s altitude instead of a fixed height
- FIX: Correct penetration RVMAT on all surfaces
- FIX: Indirect damage impact for missiles
- FIX: 2S6 (SA-19) 3D model errors
- FIX: Corrected 9K332 (SA-15-M2) magazine count from 8 to 16
- FIX: Rampart heights on sites
- FIX: Numerous typo errors in the classnames references inflicted by auto-correct.
- IMPROVED: Corrected ballistic coefficient on missiles ("airFriction" value)
- IMPROVED: Changed ‘DefaultEventHandlers’ references to ‘EventHandlers’ to address mod cross-compatibility issues
- IMPROVED: Optimization of missile effects scripts to address potential lag issues
- IMPROVED: SA22 engagement values to favor cannon at shorter ranges
- IMPROVED: ZSU-23-4-M4 engagement values to favor cannon at shorter ranges
- IMPROVED: Shell ejection drop behavior now ejects the spent shells with directional velocity
- IMPROVED: Shell ejection effects for cannons and AAA artillery
- IMPROVED: KS-12 and KS-19 recoil and shell effects
- IMPROVED: Increased brightness on tracer effects
- IMPROVED: AAA Airburst visual effects, audio effects, and damage values
- NEW: Reorganized vehicle classes with new “SHORAD” category. SHORAD vehicles possess counter-missile capabilities
- NEW: Reorganized factions to accommodate non-CUP mods such as RHS, etc. CUP faction is now optional.
- NEW: Vehicles now configured with PhysX properties
- NEW: Kh-25MP (AS-12) anti-radiation missile for Soviet-heritage loadouts
- NEW: New missile exhaust smoke plume effects on static launchers for SA-2, SA-3, MIM-104, SA-10, SA-20, NASAMs static

- NEW: New missile exhaust smoke effects on mobile launchers for NASAMS mobile, SA-11, SA-17, SA-15, SA-19, SA-22, MEADS
- NEW: Config changes for Zeus and Arsenal compatibility (I hope); Editor preview pics for all vehicles
- NEW: Muddy reddish-textured ramparts
- NEW: 91N6 (NATO: “Big Bird”) early warning radar for SA-20
- NEW: MIM-23 HAWK SAM system, supporting radar, and control vehicles
- NEW: ZU-23 “modernized upgrade” version with integrated MANPAD launcher
- KNOWN ISSUE: Soldiers yelling "out of ammo" when disembarking vehicles even when they have a full complement of ammo
- KNOWN ISSUE: Soldiers reporting "out of fuel" on some vehicles. This is due to scripting solutions required for proper operation of the stationary launchers. These reports can be ignored... just chatty AI
- KNOWN ISSUE: ZU-23-4 (Shilka) M4 doesn't expel smoke rounds. This appears to be a Shilka model problem and is being researched

v4.0: 12/6/2015 – FIRST VERSION that supports Arma3!

- FIX: Missile effects on several missiles.
- FIX: Missing FireGeo LOD effects on some vehicles.
- FIX: Cleaned up RPT errors from MIM104 and CRAM site spawn scripts.
- FIX: Minor 3D model fixes for C-RAM vehicle.
- FIX: ALARM 3D model and config fixes.
- FIX: Radome 3D model geometry.
- FIX: 76N6, 30N6E, and 96L6 mast radar ladders adjusted for A3 geometry.
- FIX: P12 Ural vehicle family fixed “black texture” issue at distance. Vehicles should no longer appear black at distance.
- FIX: Numerous scripting-related issues.
- IMPROVED: Buk 9K317-M3 (SA-11 M3) weapon firing order.
- IMPROVED: More realistic 57E6 (SA-22) missile performance characteristics.
- NEW: The mod currently utilizes CUP factions; therefore the CUP mod is a pre-requisite for this addon!
- NEW: The mod also utilizes the POOK_CAMONETS pack; therefore the camonets mod is a pre-requisite for this addon!
- NEW: Removed external texture, RVMAT, and proxy dependencies. Download sizes are significantly increased as a result.
- NEW: A3 features: Some vehicles feature mirrors and gunner view panels.
- NEW: 2S6 Tunguska (SA-19) self-propelled SHORAD point-defense vehicle.
- NEW: Pantsir S-1 (SA-22) and 2S6 Tunguska (SA-19) missile tubes expel end caps; cannon shells drop.
- NEW: Accurate 3D model for 57E6 (SA-22 and SA-19) missiles, with discarding second stage.
- NEW: S-75 (SA-2) launcher units, radar units, and site spawner units.
- KNOWN ISSUE: Engine noises are not functional. This is due to PhysX engine limitations and may be addressed in the future.
- KNOWN ISSUE: CUP Soldiers yell “out of ammo” when disembarking. This is likely a CUP-related issue and does not affect gameplay.

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v3.1: 10/7/2015 – FINAL version for Arma2!

- FIX: C-RAM shadow bug.
- NEW: RWR Incoming Missile alerts for some planes. This feature is WIP and only applies to some planes at present. Scripting instructions added for addon/mission makers to add this new alert feature to any plane in-game (including BIS planes).

v3.0: 9/13/2015

- FIX: Missing C-RAM, NASAMS spare tire and fuel can actions.
- IMPROVED: Reverted ARM Detect script to original function (no more auto-fire), and moved the detect-then-auto fire feature to a NEW script. Original 2-action sequence is once again the default.
- IMPROVED: NASAMS and CRAM targeting capabilities improved.
- IMPROVED: ZSU-23-4 and ZSU site burst fire rates reduced to more realistic levels.
- IMPROVED: SAM batteries now equipped with 2x magazines to provide better in-game behavior. Average 10 minute magazine reload time. This may be altered in the future if reload vehicle behaviors can be improved, since the AI drive the reload vehicles like retarded monkeys and currently can’t properly navigate terrain to reach the batteries.
- IMPROVED: MAZ 7910 CIV factions updated with unique textures and cargo. This will eliminate confusion vs. military models.
- NEW: CRAM airburst now ranges to target height; airburst no longer fixed at 250m altitude.

- NEW: Counter-missile battery feature for “point-defense” capable SAM’s: 9K33x SA-15, 96K6 SA-22, MIM-104 Patriot, MEADS, and C-RAM ADS. Engagement against SCUD’s and other SSBM’s is being researched.

v2.7a patch: 8/1/2015

- IMPROVED: Reorganized ZSU-23-4 classes and removed duplicates to work better with spawn site script.

v2.7: 7/30/2015

- FIX: Removed proximity fuse “burning” effect on aircraft.
- FIX: Pantsir S1 commander light couldn’t be damaged.
- FIX: 9K331 lights couldn’t be damaged.
- FIX: Occasional pop-up errors in ZSU config.
- FIX: Missing sounds in CRAM, NASAMS config.
- IMPROVED: SA-10 vehicle textures.
- IMPROVED: BUK family internal views.
- NEW: ZSU crew can be shot (added FireGEO LOD components missing in original model).
- NEW: ZSU driver hatch turn-out/turn-in.
- NEW: MEADS mobile launch system.
- NEW: S-300 PMU2 “Favorit” (NATO: SA-20 “Gargoyle”) SAM system including:
    - SA-20 Site spawner units.
    - 5P85TE S-300 PMU2 (NATO: SA-20B) static launcher.
    - 30N6E2 Engagement Radar vehicle (NATO: “Tomb Stone”).
    - 48N6E2 SA-20 missile. Slightly enhanced performance in-game over SA-10 missile.

v2.6: 7/25/2015

- FIX: “KILLED” cleanup script was not removing gunner units for USMC, US factions.
- FIX: Site radars’ “KILLED” scripts not resetting to allow additional site spawns.
- FIX: PENDING: Some ARM missiles’ flight models are being researched for more realistic performance.
- IMPROVED: ARM missile script detection will now automatically fire the currently selected weapon is an AR missile. This change was implemented to avoid loss of target at longer distances due to game engine view distance limitations.
- IMPROVED: ARM missile scripts will create a target marker at the SAM/AAA site.
- IMPROVED: SON-50 / S60 AAA site employs new height tracking; experimental
- NEW: ALARM loiter mode. Uses the “ARM-Indirect Fire Mode” action to fire loiter mode.

v2.5: 7/19/2015

- FIX: Premature detonation of airburst ammunition at AAA sites.
- IMPROVED: AAA now ranges to target height; airburst no longer fixed at 250m altitude. Currently implemented for ZSU, KS12/19 sites. Implementation for S-60, ZU sites pending.
- NEW: “KILLED” cleanup script for all spawned sites. No more residual ramparts, nets, etc.
- NEW: KS-12 85mm AAA battery
- NEW: KS-19 100mm AAA battery
- NEW: KS-19 / KS-12 AAA Sites

v2.4: 7/14/2015

- FIX: PU-12 Rampart height.
- FIX: SA-10 Rampart height.
- FIX: Editor Class errors.
- FIX: PRV-11 headlight removed.
- FIX: PRV-11 geometry. Vehicle should no longer slide downhill.
- FIX: Removed various external texture and RVMAT dependencies.
- FIX: Reversed Buk SA11/SA17 turret ‘initTurn’ direction.
- FIX: Corrected the ZSU Commander radar view and motion range (finally!)
- IMPROVED: ZSU-23-4 3D model: Cover plate over guns now animated; random plant clutter; random bumper.

- IMPROVED: SAM and AAA Sites now disable headlights.
- IMPROVED: SAM and AAA sites now spawn faction flags.
- IMPROVED: AAA airburst height adjusts to target altitude. AAA is now much more lethal!
- IMPROVED: PU-12 / ZSU-23-4 AAA Site engagement ranges improved; overall more aggressive.
- IMPROVED: New Buk SA11/SA17 texture sampled from real world photos.
- IMPROVED: Buk SA11/SA17 missile 3D model.
- NEW: Empty Radome objects now available in editor (found in Empty category).
- NEW: Orange tracer for ZSU-23-4 airburst.
- NEW: ZSU-23-4M4 (Shilka) midlife improvement version, featuring 6x Strela launcher and improved targeting.

v2.3: 7/10/2015

- FIX: Rampart spawn issues in site scripts.
- FIX: AAA Site spawner “out of ammo” messages.
- FIX: BUK Family launchers reversed insignia.
- IMPROVED: Editor Class categories renamed for better organization… AAA and SAM units now listed separately.
- IMPROVED: MIM104 proximity fuse increased to 30m.
- IMPROVED: BUK Family interior views no longer empty.
- IMPROVED: 9K317-M3 3D model adjusted.
- NEW: Published SAM Guide v1.0
- NEW: PU-12 ZSU site spawner with 4x ZSU-23-4 primary units. Radar vehicles in RangeMaster pook_BTR60.
- NEW: NASAMS site spawner with 4x NASAMS primary units and CRAM point defense units.

v2.2: 7/4/2015

- FIX: SA10 3D model errors
- IMPROVED: NATO designations added to vehicles (WIP)

v2.1: 6/26/2015

- FIX: Geometry errors causing some SAM gunsights to aim downhill (not seen on flat terrain).
- FIX: Some static SAM launchers incorrectly ejected dead gunners.
- FIX: Missing texture error in pook_SAM.
- FIX: Missing ramparts on MIM104 site.
- IMPROVED: SAM Site names in editor.
- IMPROVED: S-125 (SA3) vehicle fireGEO lods.
- IMPROVED: S-125 (SA3) missile texture.
- IMPROVED: ARM Detection script now checks if plane is flying.
- NEW: PRV-11 "Side Net" height finding radar for SA3 and AAA sites.

v2.01: 6/24/2015

- FIX: C-RAM inheritance problem
- FIX: Missing pook_P12.pbo

v2.0: 6/23/2015

- FIX: SA10 INS vehicles invalid soldier type.
- FIX: 9K37 (SA11)/ and 9K317 (SA17) faction errors.
- FIX: Missing Russian 9K331 (SA-15 tracked).
- FIX: Improved texture sets with less saturated colors.
- FIX: Improved MIM104 Patriot performance
- FIX: All missiles' engagement parameters improved.
- NEW: SAM Engagement Radars now "paint" targets and cause RWR spike.
- NEW: SAM Site Spawners now include more AAA variety (ZU-23, ZPU-4, or S-60).
- NEW: SAM Sites relocated to new editor category "Air Defense Sites".
- NEW: SON-9 AAA Fire Control Radar.

- NEW: SON-50 AAA Fire Control Radar.
- NEW: PUAZO 6/60 AAA Electro-optical Rangefinder.
- NEW: 9S36 mast-mounted engagement radar for SA17/SA11
- NEW: Buk M3 (SA17-M3), the newest missile platform in the 9M317 Buk line.
- NEW: AAA Site Spawners using SON radars and appropriate AAA batteries.
- NEW: ARM Anti-Radiation Missile functionality... more details in readme!
- NEW: SA15 and SA11 proximity fuses.

v1.7: 6/5/2015

- FIX: Russian faction SA10 site now spawning Russian soldier AA crew.
- FIX: SA10 site minimum engagement altitude is raised to 150m.
- FIX: SA10 site firing after radar dies... crew now disembarks useless launchers.
- FIX: SA10 site spawning empty SA15 vehicle
- FIX: SA10 site failing to spawn radar vehicle gunner
- FIX: SA10 site behavior tweaked to be slightly less agressive.
- FIX: 30N6E minor texture fixes.
- FIX: 5P85D minor texture and 3D model fixes.
- FIX: SA3 launcher 3D model improved.
- FIX: 76N6 RVMAT fixed; updated textures and added new variations
- FIX: Minor RPT errors.
- NEW: 76N6 ladders now work; added maintenance platforms
- NEW: SA3 booster stage discard (see sample mission)
- NEW: SA3 real life sound clip
- NEW: SA3 performance matched to real world data
- NEW: SA3 smoke trail matched to real world data
- NEW: P12 "spoon rest" Acquisition radar
- NEW: SA3 site spawner with new vehicles and layout.
- NEW: Radar domes / weather covers based on real world data
- NEW: Sites now spawn point defense systems... either AAA or close-range SAMs

v1.6: 5/30/2015

- NEW: SA10 System: Launchers, mobile and static radar, and support units.
- NEW: SA10 "spawner" units for automated SAM site creation. Scripts based on Patriot MP-friendly scripts.
- NEW: Experimental: Zeroing added to C-RAM.

v1.5: 3/10/2015

- FIX: All configs are "standalone" meaning they no longer inherit from other vehicle configs.
- FIX: Added missing CRAM and NASAMS radars
- FIX: Patroit MP multi-spawn fix
- FIX: Updated other scripts for better MP function
- FIX: Pantsir commander light always on.
- FIX: Numerous small config issues (missing some crew getin points, etc).
- FIX: Some 3D model issues (missing crew getin points, exhaust points, etc).
- FIX: SA3 static "wandering" turret (geometry fix).
- NEW: SA3 front gunner position.
- NEW: Display and class names for SA3 tracked updated to standard naming convention (see classname list in readme).
- NEW: Patriot "killed" cleanup script.

v1.4: 1/16/2015

- FIX: Missing CDF Independent units.
- FIX: Wrong texture on desert OE349 antenna units.
- FIX: MIM-104 erratic movement on sloped surfaces.

- FIX: SA3 static and MIM104 popup errors discovered in MP testing.
- NEW: MIM104 sites now spawn a radar and antenna nearby.

v1.3: 1/10/2015

- FIX: CRAM and NASAMS damage textures
- FIX: MIM-104 gun target creep
- FIX: MIM-104 crew config errors
- FIX: SA11 fire geometry missing parts
- NEW: Removed MIM104 reliance on pook_HEMTT
- NEW: MIM-104 launcher placement now includes scripted radar placement
- NEW: SA-3 Mobile and static launchers

v1.2: 1/4/2015

- Fixed numerous small errors.
- Addition of MIM-104 Patriot systems.

v1.1: 12/9/2014

- Fix reported errors, updating small issues.
- Add NASAMS and C-RAM systems.

v1.0: 12/8/2014: INITIAL A2 RELEASE

ADDON SPECIAL FEATURES

Arma2 factions are represented (via CUP), since it stands to reason that the CDF and Takistani Armies would have acquired these in their inventories. No A3 factions are planned for inclusion.

New class names have been introduced to avoid clutter in the editor:

- "Air Defense - SAMS": Contains the SAM launch vehicles and radar vehicles
- "Air Defense Sites": The SAM sites/groups are found here.
- "Air Defense": Contains AAA, support and command vehicles, etc.

This addon contains not only new vehicles, but also several new features to enhance gameplay, covered in detail below:

- Proximity Fuses
- Counter-missile defense capability
- Automatic Spawning of Air Defense Sites
- Anti-Radiation Missiles
- RWR Incoming Missile Alerts
- ECM / Jamming script support

PROXIMITY FUSES

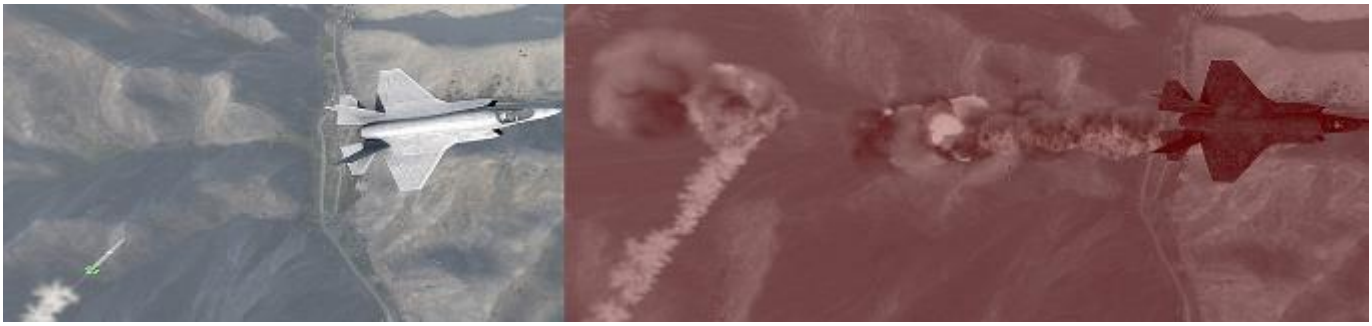
The SAM and AAA batteries contain new proximity fuse airburst modes. This feature was added to account for the game engine's lack of proximity / indirect damage effects, where the missile would normally need to "touch" the aircraft 3D model to detonate. The proximity fuses in this mod enable the missile to simply "get real close" to the aircraft to deal damage. How close depends on the capabilities of the specific missile. Some missiles have a larger proximity fuse capability compared to others.

The targeted aircraft will be forced to either completely spoof the missile to avoid damage, or fly low enough to the terrain to keep the missile from cleanly engaging. Of course, the lower you are to the ground, the better that enemy AAA, MANPAD, or SHORAD defenses will be able to engage. This will make flight sorties much more "interesting" for the pilots! Learn how to Terrain Mask.

Proximity fuse damage is not as high as direct hits; however the lethality of "near misses" is greatly increased. This feature was adjusted for different missiles based on real-world data, so some missiles have a larger proximity fuse range than others, and deal varying amounts of damage. Research is ongoing and adjustments are made as new data is obtained.

The proximity fuse feature is a much-loved feature that has yielded a workable mix between realistic effectiveness and gameplay!

S-300 (SA-10) SAM proximity fuse used against an enemy aircraft…

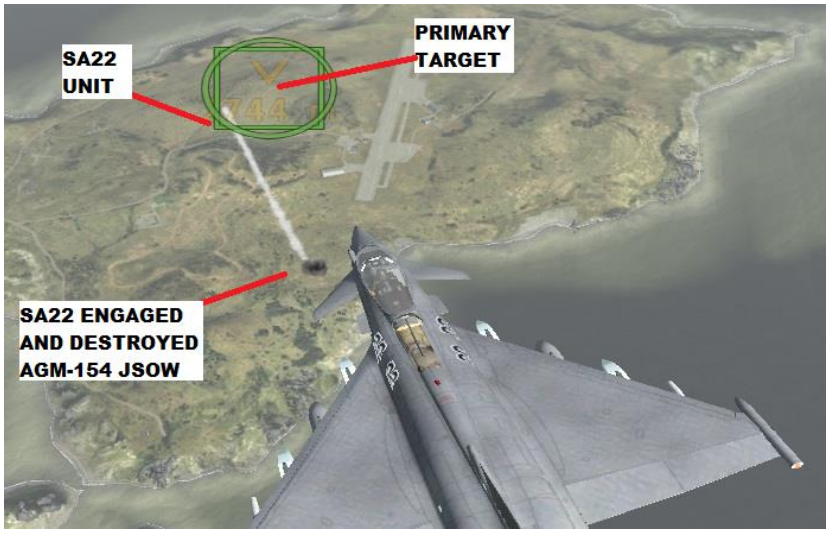


SHORAD COUNTER-MISSILE DEFENSE CAPABILITY

The SHORAD (Short Range Air Defense) point-defense SAM systems in the addon now contain a counter-missile defense capability by engaging air-to-ground (A-G) missiles, precision guided ordnance (LGB's), SSBM's such as SCUD's, and even some cruise missiles. **This feature only applies to AI vehicles**. The counter-missile feature is automatically managed by AI units. SHORAD batteries controlled by the AI will automatically target and engage certain types of A-G (air to ground) ordnance.

The SHORAD systems can engage most, but not all of the precision-guided munitions. Specifically, anti-radiation (ARM) missiles and some of the faster flying A-G missiles cannot be targeted. This may be modified in the future.

A successfully defended A-G attack by enemy SHORAD…



SHORAD systems are now in their own category in the editor for better organization. The SHORAD systems in the addon capable of counter-missile defense include:

Russian/Soviet SHORAD Systems	Western SHORAD Systems
9K331 and 9K331 (SA-15)	C-RAM
2S6 (SA-19)	MEADS
96K6 (SA-22)	MIM-104 (Patriot) PAC-3

The nature of protecting against incoming missiles inherently constitutes an amount of uncertainty. Certain situations will overwhelm the capabilities of the counter-missile defense batteries; therefore mission makers should understand that this cannot be relied upon to defend critical assets in all situations. Enemy attacks with A-G or precision-guided weapons that make use of salvo-firing and/or group engagement of multiple aircraft will greatly increase chances of penetrating the SHORAD systems' capabilities. Enemy attacks consisting of single-fire A-G missiles are much easier for the SHORAD systems to protect against.

Therefore if you find that some A-G weapon attacks are exploding before they reach the target, this may be due to the fact the SHORAD system successfully destroyed the A-G weapon before it could hit its target!

GROUP / SITE PROTECTION

Incoming A-G threats will be targeted within about 7.5km of the SHORAD battery. The counter-missile defense systems can protect any friendly assets within about 1.5km of their location. Friendly airfields, SAM sites, FARP's, etc. will be automatically protected by the SHORAD battery within this range.

This means that mission/addon makers may take advantage of this by locating any of the SHORAD systems in vicinity to the high-value assets. The SHORAD system will automatically extend protection to those assets since they are nearby. Mission makers need to do nothing else to take advantage of this feature.

PRIORITY PROTECTION

The SAM sites in this addon will automatically pass targeting information to their SHORAD batteries when incoming threats are detected. This provides priority targeting for those assets in the SAM site. Priority targeted missiles will be engaged before other incoming A-G targets in the vicinity.

Mission/Addon makers may use the following EH script to add this "hand-off" capability to any other units or assets you choose:

```
_incoming = this addEventHandler ["incomingMissile", {_this execVM "\pook_SAM\scripts\incomingGroup.sqf"}];
```

When using this event handler script, that unit will receive "Priority" protective targeting from the SHORAD if it is ever attacked. This priority will over-ride other units' protection nearby. Thus, if one "priority" unit and one "non-priority" unit are placed nearby (within 1.5km) of the SHORAD unit and are attacked both at the same time, the "priority" unit will be protected first, meaning that the incoming A-G ordnance fired at the "priority" target will first be targeted by the SHORAD battery.

The use of this script with vehicles is basic enough… simply add the EH script to that vehicle INIT. To protect a building, or other "non vehicle" asset such as a control tower, simply assign a soldier unit to guard that building, and place the soldier within that building. The building will receive "priority" protection since the guarding soldier will be responsible for passing the Priority request to the SHORAD unit.

SITES: AUTOMATIC SPAWN OF AIR DEFENSE SITES

I have created ***Site Spawner Units*** to correctly simulate SAM IADS / AAA sites in-game. They are found under the “Air Defense Sites” in the editor. I recommend use of the site "spawner" units instead of individual placement of the units. Class names are listed below. The Site spawner is an AA soldier with an INIT script to spawn a complete SAM or AAA site. These automatic site spawners completely eliminate the need for tedious manual placement of IADS assets. Site spawners work in both SP and MP.

The sites are governed by the central engagement radar, upon which all of the AI logic revolves. Destruction of the central site engagement radar will either completely disable, or greatly impair the abilities of the site, depending on the type of site in question. Site AI will engage enemy aircraft beyond visual range (BVR) if the target meets certain criteria. Real world ranges are simulated!

New in v2.6: Spawned Sites that are killed (e.g. main radar destroyed) will “disband” after about 10 minutes of game time. This removes the vehicles, gunners, ramparts, etc. and removes the group. This was implemented to avoid clutter issues in missions.

BVR engagement made by an S-300 (SA10)… note the distance marker…

SITE SPAWN PLACEMENT

Simply place/spawn the “spawner” unit in the editor. That’s it!

The spawner unit acts as a group placement item for use in mission building, etc. without worry of building the group and all its intricacies. All a mission builder needs to do is spawn the appropriate unit in-game, or place it in the editor. No more scripting issues since the spawn script does it all for you!

The spawner unit scripts are MP compatible! The Site Spawner could be used to create random sites by random spawning within a map, or as a dedicated mission task where destruction of the site is the completion condition for the task.

NOTE: The scripts are configured to contain one type of site per “mission space”! Therefore spawning multiple SA3 sites, for example, will result in the first spawner creating a site, and the subsequent “spawner” units will remain as single AA soldiers.

Since the AI-controlled vehicles are intended to be used as scripted/spawned site creations for missions and MP play... not as a "player controlled" site, they are LOCKED at spawn to avoid any script problems! Mission makers may still choose to place individual units if they so desire (see the CLASSNAMES appendix, below) however the AI logic scripts will NOT apply to any individually placed weapon vehicles. While AAA vehicles do have some built-in targeting logic, their skill levels will not benefit from nearby radars that are manually placed. The only way to take advantage of the targeting and skill logic in the scripts is to place the site spawner units.

SAM SITE BEHAVIOR

- **Engagement Distances:** The SAM site crew will engage targets beyond visual range (BVR) out to 20-30km in the game... YES, 20-30km! Exact distances depend on specific capabilities of the radar system, and several other factors. They typically won't engage at the absolute maximum ranges but wait until you're a little closer.
- **"Shoot-into-mountains" fix:** NEW FUNCTION In v2.0: some of the sites have additional logic to check for Line-Of-Sight (LOS) to the target to avoid shoot-into-mountain AI issues. This may induce lag and is considered EXPERIMENTAL at present. The script does NOT have the ability to overcome ALL of the "shoot behind mountains" problems in-game for all situations; therefore rugged terrain may yet see the shoot-into-mountain behavior. Feedback is appreciated!
- **Disabling the site:** Destruction of the central engagement radar vehicle will either completely disable, or severely cripple, the capabilities of the site launchers. They will be reduced to "standard" in-game visual engagements of out to about 2-3km max. This means that accurate Wild Weasel SEAD missions can be simulated! The crippled SAM units may still attempt to engage any aircraft with the in-game visual engagement range if they have secondary targeting systems and are capable of firing.
- **Damaging the site:** Destruction of the early warning radar and other radar support vehicles will cripple the AI skill settings, diminishing their skills by a certain percentage. This will of course have less impact on sites where the weapon vehicles have secondary optical systems, and will have more impact on sites where the weapon vehicles rely mostly on the radar support vehicles for targeting information.
- **Cleanup:** New in v2.6, the destruction of the radar also removes the entire site (and groups) after ~10 minutes game time.

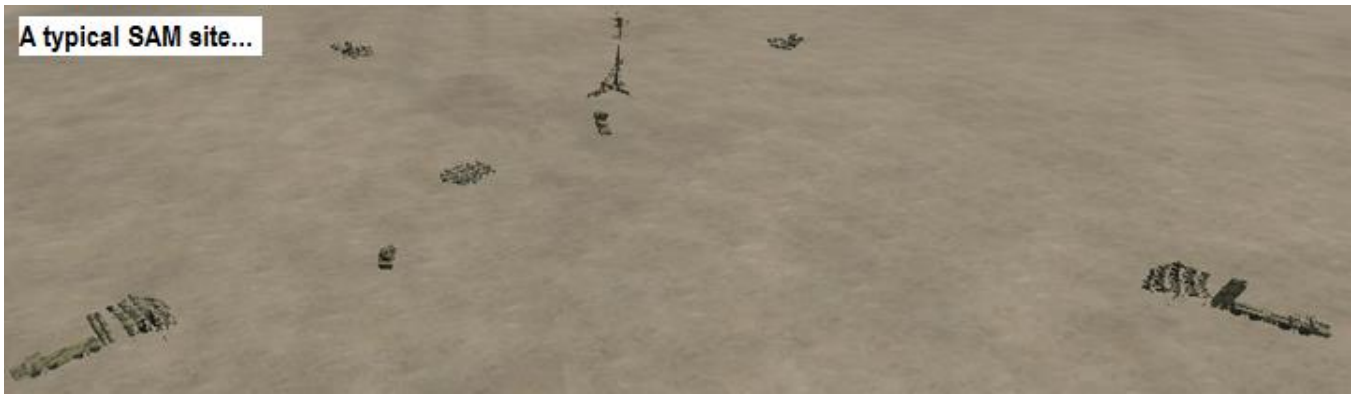
An S-300 PMU2 (SA-20) SAM site's SHORAD SA-15 unit attacks a hostile aircraft…

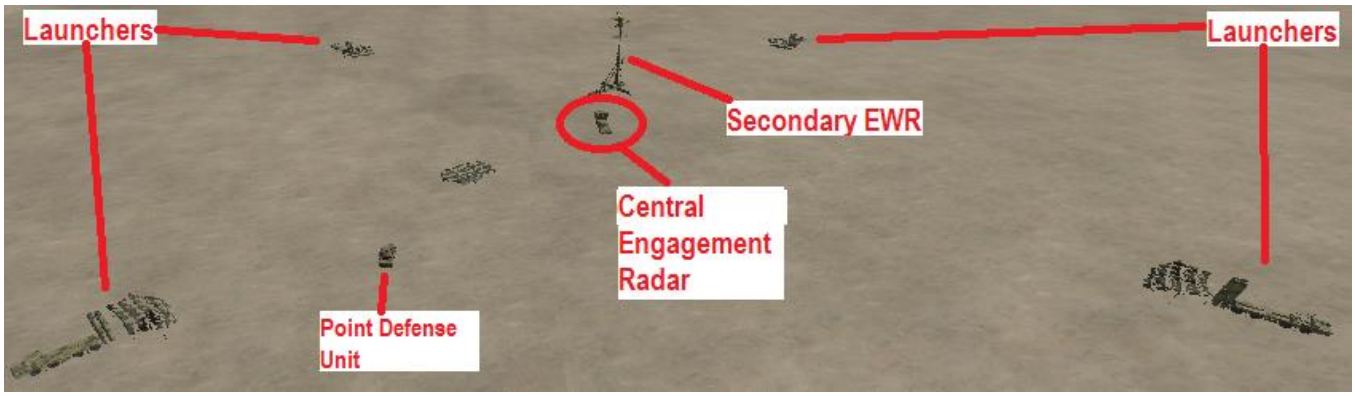
SITE LAYOUT

The spawned sites follow the classic "star" pattern for vehicle deployment, and will contain the following vehicles and ramparts, with some variation depending on the specific sites:

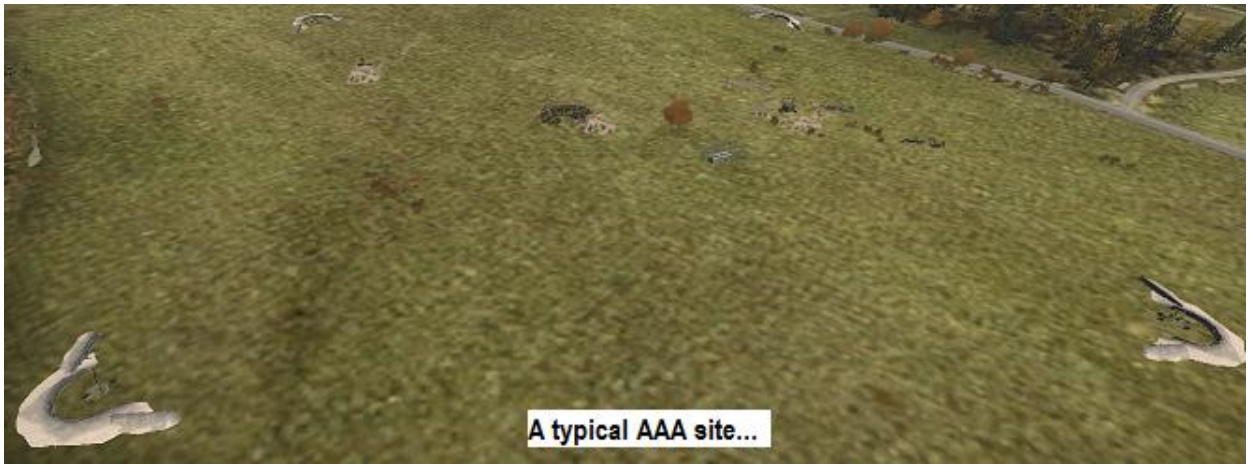
- 1x central radar vehicle, which is the control vehicle for the site's governance script.
- 4x primary launchers or 4x AAA batteries. Some may contain 6x primary units, depending on type.
- The primary batteries will have additional ammo for the launchers, with a 10-minute average reload time to simulate real world reload needs. Actual reload ammo vehicles are not implemented due to terrain blocking issues with stupid AI drivers.
- 1x acquisition radar array, with an optional 2nd mast array (depending on type).

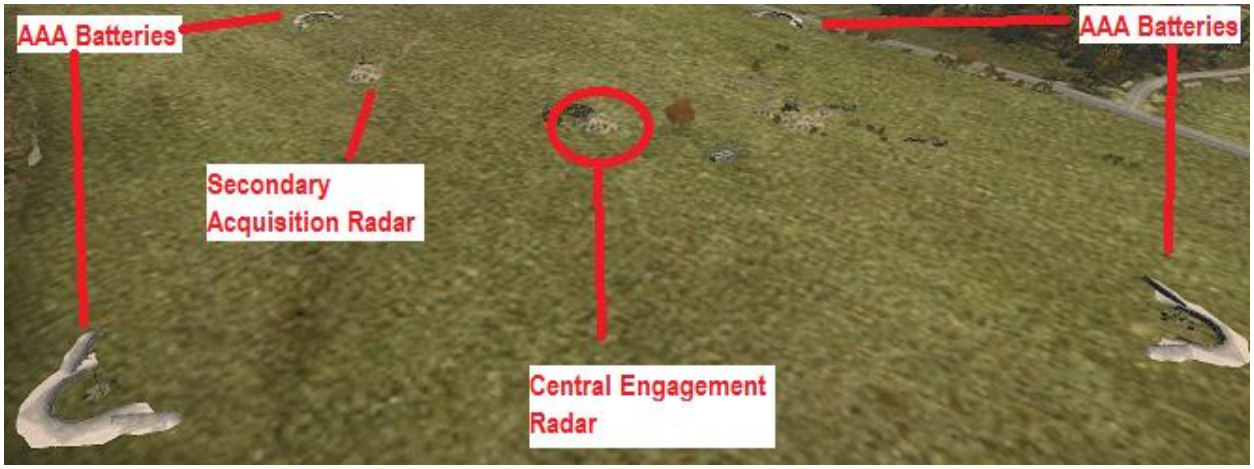
- 1x-2x SHORAD point defense unit(s), which is standard deployment practice. SHORAD units serve for the “extremely close” protection that is too close or too low for the SAM to engage. The SHORAD unit may consist of one or more MANPAD launchers, AAA batteries, or short-range SAM launchers dedicated to the Point Defense role (such as SA15 or SA22). As stated previously, these point defense units will automatically target some incoming types of ordnance. As of v3, the SAM sites’ SHORAD batteries will engage some types of incoming ordnance, as described in the previous section.
- All launch and radar vehicles are protected by earthen ramparts. You’ll need to get some altitude to attack!
- Various bunkers and nets.
- Site is 200m across, with random placement of secondary vehicles within this circle.



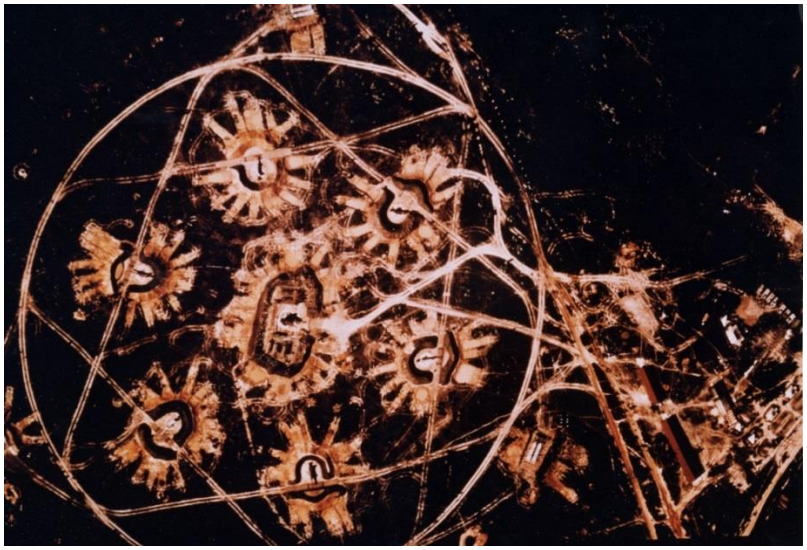


The AAA sites follow the same basic layout…





Aerial footage of a real world SA-2 site in Cuba, demonstrating the classic “star” pattern of vehicle deployment that the site spawners in this addon simulate (photo from the National Museum of the US Air Force):



Flak Airburst from ZU23/ZPU4 AAA site…

ANTI-RADIATION MISSILES

The use of ***Anti-Radiation Missiles*** (ARM) is modelled in the addon. The ARM's are used for the suppression and/or destruction of enemy air defense (aka SEAD / DEAD missions). Wild Weasel missions can finally be realized! This feature exists via 2 action items, and of course the plane must have an anti-radiation missile ready to go!

SEAD missions are employed where Integrated Air Defense Systems (IADS) can hamper air action. DEAD missions are specifically tailored to eliminate the IADS threat in an area. Aircraft engaging in SEAD / DEAD missions are referred to as Wild Weasels. These so-called Wild Weasel missions are called when pilots deliberately put themselves into the IADS defense envelope, in the hopes that enemy radar will activate and reveal the IADS threat. The Wild Weasels clear the way for bomb and strike aircraft.

Real planes must be equipped with the correct Emitter Locating System (ELS) and targeting equipment to ensure the AR missiles can correctly target the radar threats. The AR missiles are designed to home in on the enemy radar emitters that control the SAM missiles in order to destroy the emitter and surrounding support equipment.

The ELS scans a ***10km*** radius for radar targets. If the ELS locator fails to locate a target, the chat window will notify you of such. Range limitations of the missiles in-game may warrant closer engagements.

The addon now contains both the British-designed ALARM and Russian-designed Kh-25MP (aka AS-12) AR missiles. Details for use of these weapons are found in the appendix.

IN-GAME USE OF ANTI-RADIATION MISSILES

In the game, the radar (and most launcher) vehicles will NOT be running their engines, therefore they will be nearly impossible to target without the use of an ARM weapon. The only real way to target a radar or launch vehicle without an ARM is either use of the game's "direct target" mode (target the crosshair) or visually referencing the vehicle. Usually either of these alternatives will require relatively close ranges to employ, meaning you'll need to be well within the SAM's firing distance before you can see it!

The ARM weapons level the playing field against SAM defenses since most SAM's can engage well beyond visual range in-game.

The use of anti-radiation missiles consists of several parts. Real-life ARM weapons possess numerous engagement options. In this addon, only "detect", "direct-fire", and "loiter" modes are simulated (*Loiter mode is a third, specialized, attack mode that is unique to the British ALARM missile*).

ARM weapon overview:

1. The pilot selects an ARM weapon. The ARM actions *assume* you have already selected an ARM as the current weapon. If you have not, you will be notified that nor ARM weapon is selected!
2. Start with the **"ARM - Activate ELS"** action (SHORTCUT: AutoHover). This action scans the area for any known SAM threats. If a valid threat is discovered, the target will be assigned and a map indicator temporarily will be created.
3. If no valid threat is discovered, pilots with ALARM's can still use the **"ARM - Indirect Fire Mode"** (SHORTCUT: AutoHoverCancel) action. This may help engage targets that are currently not using their radars. Details below…

OPTIONAL: If you find that your assigned target is removed before you can engage it, the "Detect and Auto Fire" option can be used to overcome that problem. To detect and engage automatically, use the **"ARM – Detect and Auto Fire"** action (SHORTCUT: AutoHover) instead of the **"Activate ELS action"**, to engage (out to 10km). This mode will automatically fire on enemy radar targets if detected. This option overcomes the long-distance target loss due to limitations of the in-game view distance settings. This option is an action-only item; no keyboard shortcut is available for this action.

These actions are explained in greater detail in the pictorial descriptions below…

PRIMARY FIRE MODE: INDIRECT-FIRE

Using the Anti-Radiation Missiles in normal, direct-fire mode is a simple 2-step action:

1. Action 1: Use the **"ARM - Activate ELS"** action. SHORTCUT: AutoHover
   - A marker will appear on the map for 60 seconds at the location of the radar target. A vehicle radio notification will be sent.
   - Once a target is identified, pilots can elect how to attack the target, if you wish only to identify and target any radar threats.
   - If no radar targets are detected within 10km, the pilot will receive the message "No radar targets detected".
   - If radars are present, but no ENEMY radars are detected, the message will be "No enemy radar targets detected".

2. Action 2: As of v.3.6, *ASSUMING* the ELS locates a radar target, the next action will be:
   "ARM - Indirect Fire Mode" SHORTCUT: AutoHoverCancel
   - That's it! Always remember to have an AR missile selected as the current weapon before you engage!
   - N**OTE:** The "CANCEL ARM" action can also be used if you choose to disregard the target. SHORTCUT: LockTarget

DEMONSTRATION OF A SEAD ATTACK ON A SAM SITE USING DIRECT-FIRE MODE WITH THE KH-31 (AS-17) KRYPTON ARM…

1. First, the pilot activates the **"ARM – Activate ELS"** action:

2. Next, the pilot can engage the target with an AR missile. If the pilot does not have an ARM weapon selected, the action will inform you of this condition. The pilot can then engage via the **"ARM – Indirect Fire Mode"** action.

- Remember that YOU as the pilot can engage radar targets out to 10km with the anti-radiation missiles. The missiles may not properly engage targets beyond the 10km limit. Terrain features may also cause the attack to fail, so plan ahead!

SECONDARY FIRE MODE: DETECT AND AUTO FIRE

Using the Secondary Detect and Auto Fire Mode for anti-radiation missiles is a single-step "fire and forget" action:

1. Use the **"ARM – Detect and Auto Fire Mode"** action.
   - No shortcut is available for this action!
   - This automatically engages the radar target ***IF*** a proper AR missile is set as the current weapon! As noted above, this behavior was updated to avoid loss of target lock at extreme distances. If you find you are losing target lock immediately after the target is detected, try this mode to see if you can auto-fire to destroy them!
   - The auto-fire feature only applies to ARM weapons! Pilots may choose to select a non-ARM weapon, and the Detect and Auto Fire script will still function if you wish only to identify and target any radar threats.

   Possible detection results:

   - If no radar targets are detected within 10km at all, the pilot will receive the message "No radar targets detected".
   - If friendly radars are present, but no ENEMY radars are detected, the message will be "No enemy radar targets detected".

OPTIONAL FIRE MODE: ALARM LOITER MODE

Loiter mode is a special feature unique to the British ALARM missile in this addon. Some newer models of the AGM-88 HARM missile system can employ a "lock-on after launch" mode and this will be added in the future.

In real life, radar operators have learned to avoid destruction by rapidly switching on their radar, or by using the radar in small enough cycles that the radar cannot be targeted by Wild Weasels. The F-117 Stealth Fighter that was shot down over Kosovo fell prey to this "rapid target" strategy, proving the effectiveness of this methodology.

Loiter mode provides the attacking aircraft the ability to "pre-stage" the ALARM missile before getting closer to the target area. The "pre-staged" missile can more rapidly engage any radar that suddenly appears within the aircraft's range. The ALARM will climb up to 40,000 feet (12km) and deploy a parachute. The passive seeker waits silently for a radar operator to activate their radar. When detected, the missile will release the chute and use gravity to guide itself to the radar source. The radar unit can't escape from this "top-down attack" even if it turns the radar back off, because the ALARM is already falling toward it!

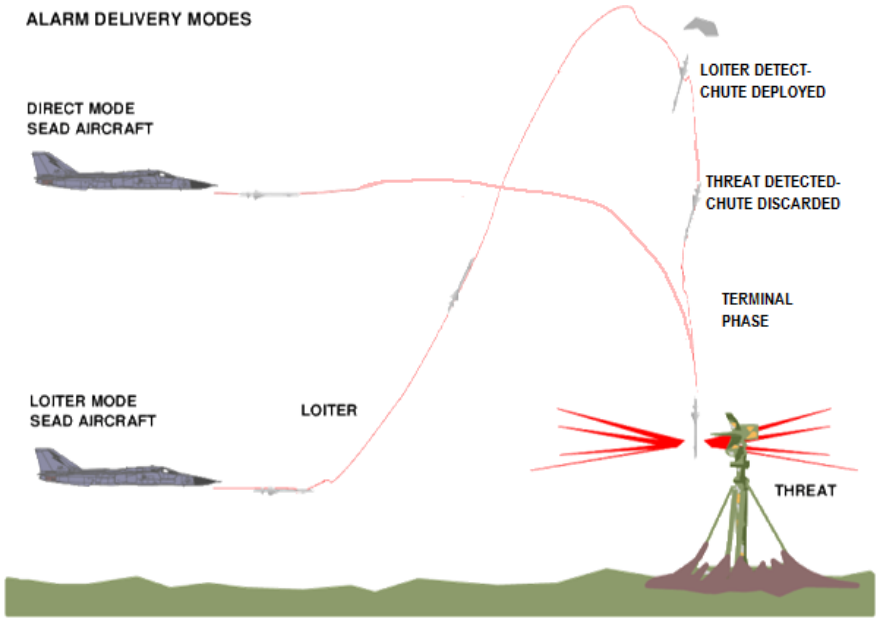
The coverage area for the Loiter mode in real life can reach out to nearly 50km. In-game, this distance is set to about 20km.

IN-GAME USE: The use of the Loiter mode is quite simple:

1. Select the ALARM as the current weapon. Remember that the coverage area is within a 20km cone!
2. Ensure no current target is selected! De-select any current target. Loiter mode assumes "no target".
3. Select the **"ARM – Indirect Fire Mode"** action (without a target). A single ALARM missile will be launched.
4. The ALARM missile will climb up to 40,000 foot (12km) altitude and LOITER for a brief time, as it slowly falls to the ground.
   a. As the pilot, no additional notifications will be provided... use of Loiter mode should be used judiciously!
5. If an enemy radar threat is detected, the ALARM missile will automatically engage its passive gravity-assisted fall toward the target. No other actions are required by the pilot, except to stay alive!

Loiter mode will be engaged ***if no current target is selected!*** If you already have a current target selected, the "normal" direct-fire mode for A-G missiles will be used to engage the target.

Description of ALARM Loiter mode; image from ausairpower.net



ARM CONSIDERATIONS

- The ARM Indirect launch mode is presented only as an option! Radar and launch batteries can obviously still be attacked by "conventional" direct attack means such as CBU, bombs, rockets, Maverick, etc. if pilots so choose. Pilots should weigh the ramifications of flying too low and close to an active SAM or AAA site to determine if this risk is warranted.

- The ARM weapon will automatically launch by itself when the pilot uses the Secondary "Detect and Auto Fire" Mode. Remain aware that the missile doesn't check for terrain interference, so attention to the plane's orientation to the site must be considered! Higher top-down attacks have a greater chance for success than engagements made from "nap of the earth" terrain masking flights.

- Vehicles at the SAM/AAA sites are protected by earthen ramparts, to protect against low-angle ARM attacks. Low-angle attacks may impact harmlessly on these ramparts. Higher-angle attacks will be more effective, but of course the higher you fly, the less cover terrain will provide you against SAM launches. So you must decide how "Wild" of a "Weasel" you wish to be!

- The "Indirect" or "Detect and Auto-Launch" actions fire the ARM regardless of orientation to the target. Extreme off-bore engagements are likely to fail since the missiles can't make hard turns, so be sure to point the plane toward the target area before launch. "Pointy end forward!" Loiter-mode and "lock-on after launch" ARM weapons will always succeed due to their top-down attack. An orientation check may be added in the future.

- The ARM's have been effectively tested across both Chernarus and Takistan. Attacks made on larger terrains will obviously take longer to reach the targets. Missile travel times vary between 30-60 seconds on average for these terrains. Patience!

- Remember that the ARM will destroy the site's ENGAGEMENT RADAR. AAA batteries and some of the SAM batteries have on-board secondary targeting systems and may still be able to engage aircraft. Therefore, a successful SEAD mission doesn't necessarily mean the SAM/AAA site is no longer a threat! Note that some SAM's will still have the ability to engage targets since they can guide their missiles using the "boresight" backup sighting methods.

- ARM sites with destroyed radars will disband (delete all units) after about 20 minutes of game time. The group will also be deleted. This will avoid MP-related issues due to excessive "junk" units on the map, or group limitation issues.

RWR INCOMING MISSILE ALERTS

Most planes have some kind of RWR (Radar Warning Receiver) sensor that provides some level of notification if a SAM is launched at the plane. New in v3.1, this alert feature is now simulated. It introduces authentic alarm sounds and, where practical, illuminated cockpit warning lights. This supplements the default in-game UI radar display that shows incoming missile information.

The alert sounds will automatically play when a SAM is launched for those aircraft configured with the proper Event Handler.

For addon/mission makers, be aware that ANY aircraft can utilize this feature, even default BIS aircraft, by performing the configuration settings listed here. Note the sounds were collected from public domain sources.

CONFIGURATION

To add this to any in-game plane, add this Event Handler scripts to the plane's INIT:

```
_scr = this addEventHandler ["incomingMissile", { [_this, X] execVM '\pook_SAM\scripts\incomingRWR.sqf'}];
```

The "***X***" corresponds to which alarm sound you want that particular aircraft to use. Select from one of the following sounds:

1. A10 (rapid beeping)
2. Su27 (moderate beeping)
3. Su25 (steady alarm tone)
4. F15 (rapid beeping)
5. F16 (vocal "warning" and rapid beeping)
6. Generic "alert" rapid beeping

Example: To use the Su25 tone, replace "***X***" with "**3**":

```
_scr = this addEventHandler ["incomingMissile", { [_this, 3] execVM '\pook_SAM\scripts\incomingRWR.sqf'}];
```

Select the best option from the list. The incomingMissile Event Handler will do the rest!

The EF-2000 RWR "missile launch" indicator…

SAM SYSTEM OVERVIEW

Below is a detailed description of the different SAM systems included, and explanations of behavior and implementation nuances.

Complete SAM systems consist of different components including:

- **Launch Vehicles**

  Self-explanatory. The vehicles are usually dependent upon a dedicated radar emitter that provides missile guidance commands and feedback of target updates to properly guide the missile up to its terminal phase. Some launch vehicles have their own on-board radar array that allows the launch vehicles to operate autonomously.

- **Engagement / Targeting Radars**

  Engagement radars are usually dedicated systems for the sole purpose of guiding the missile. These dedicated systems are usually the SAM missile's only means to obtain guidance data to the target. Many missiles have their own on-board radar system that guides the missile in its final terminal phase. Destruction of the engagement radars usually renders a SAM site inoperable; however some SAM engagement systems rely on secondary optical guidance solutions. Designs are usually static in nature, while some designs are mobile and intended for use with mounted infantry divisions where mobility is key.

- **Acquisition / Early Warning Radars**

  EWR systems are usually long-ranging systems, providing the first alert of incoming air threats. They normally hand off the target data to the dedicated engagement radar systems when the targets come into range. SAM launchers do not necessarily depend upon EWR systems if they have other means of acquiring the targets, such as optical tracking or "buddy" reports.

- **Support Vehicles**

  Normally the SAM sites will have power generators, command posts, and reload/rearm vehicles. Currently the addon's implementation of support vehicles has been limited due to AI terrain issues when "rearm" commands are issued to AI rearm vehicles, so some site launchers are equipped with additional rounds to simulate the reload abilities.

RUSSIAN / SOVIET IADS SYSTEMS

These systems are loosely grouped according to manufacture. In-game, all sides (West, East, and Independent) will possess the ability to use these via the different factions. For example, CDF for West use, GUE for Independent, etc. Some factions do not use all systems, so for example Russia will not have an SA3 available in the editor.

NOTE: The unmanned radar system vehicles are found under “Structures” > “Air Defense – SAM”.

S-75 | NATO: SA-2 “GUIDELINE”

INTENDED USE: Medium-Long range SAM

- The S-75 (NATO: SA2) is a two-stage long-range IADS system for use against aircraft and other airborne threats.
- The static launcher is intended for use within the SA2 site (see below). While not accurate, it may be used as a standalone launcher for mission building purposes.
- The S-75 is represented in-game as both a static launcher, and a new “midlife upgrade” mobile version.
- The system is still in use and is being upgraded with modernized electronics and mobile launch platforms that make use of legacy tank chassis, making this a viable option for "third world" factions.

FEATURES:

- The SA2 is a two-stage missile. The booster stage 1 will discard in-game after 5 seconds of burn time. Pilots may notice the discarded booster stage falling through the air.
- The "midlife upgrade" mobile version is mounted on a T55 chassis per Real World data.
- The midlife upgrades consist of not only a mobile platform, but electronics improvements to the missile system. Therefore this “legacy” system may prove quite formidable.
- The SA2 missile uses a proximity fuse for “area” damage instead of “direct contact” damage
- SA2 Site Spawner Unit is available in the editor under “Air Defense Sites”
- Launch sounds and smoke plumes taken from real-world data and video footage.

UNITS:

Launch Vehicles	
S-75 | NATO: SA2 Static Launcher Chinese PLA Designation: “HQ-2”	

S-75 Mobile Launcher.

The Cuban “midlife upgrade” system is modeled. This design is in use in Cuba and according to Janes’ is also reportedly in use in Ethiopia.

Chinese PLA Designation: “HQ-2”

Engagement Radar

SNR-75 | SA2 radar (NATO: Fan Song)

The SNR-75M2 (also designated RSNA-75M) | NATO: Fan Song –F model is employed in the mod.

Acquisition / Early Warning Radars

P-12 | NATO: “Spoon Rest” Acquisition Radar

Enter this into the vehicle's INIT to place the vehicle with the radar mast raised:

```
_scr = [this] execVM "\pook_P12\data\scripts\raise_radar.sqf";
```

Enter this in the vehicle’s INIT field to place the un-hide the camo net deployed:

```
this animate ["camonet", 0];
```

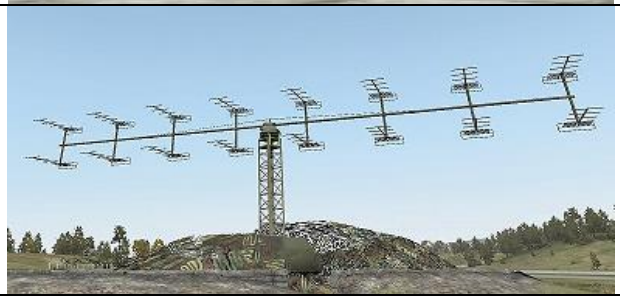
P-18 | NATO: “Spoon Rest-D” Acquisition Radar

Enter this into the vehicle's INIT to place the vehicle with the radar mast raised:

```
_scr = [this] execVM "\pook_P12\data\scripts\raise_radar.sqf";
```

Enter this in the vehicle’s INIT field to place the un-hide the camo net deployed:

```
this animate ["camonet", 0];
```



PRV-11 Height-Finding Radar	

S-125 | NATO: SA-3 “GOA”

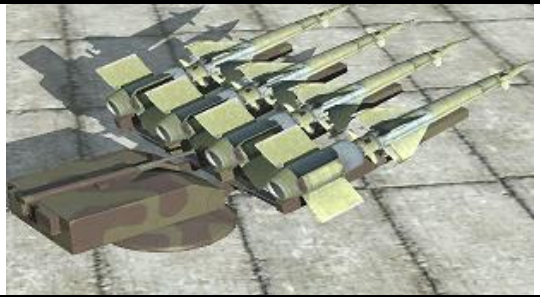
INTENDED USE: Medium-Long Range SAM

- The S-125 (NATO: SA3) is a two-stage long-range IADS system for use against aircraft and other airborne threats.
- The static launcher is intended for use within the SA3 site (see below). While not accurate, it may be used as a standalone launcher for mission building purposes.
- The S-125 is represented in-game as both a static launcher, and a new “midlife upgrade” mobile version.
- Since this platform is noted for shooting down an F-117 Stealth Fighter during the Balkan Conflict, it provides an interesting option for "third world" factions.

FEATURES:

- The SA3 is a two-stage missile. The booster stage 1 will discard in-game after 2 seconds of burn time. Pilots may notice the discarded booster stage falling through the air.
- The "midlife upgrade" mobile version is mounted on a T55 chassis per Real World data.
- The midlife upgrades consist of not only a mobile platform, but electronics improvements to the missile system. Therefore this “legacy” system may prove quite formidable.
- The SA3 missile uses a proximity fuse for “area” damage instead of “direct contact” damage
- SA3 Site Spawner Unit is available in the editor under “Air Defense Sites”
- Launch sounds and smoke plumes taken from real-world data and video footage.

UNITS:

Launch Vehicles	
S-125 | NATO: SA3 Static Launcher	

S-125 | NATO: SA3

Mobile Launcher. The Polish-design Newa-SC “midlife upgrade” design is modeled in the mod.

Engagement Radar

SNR-125 | NATO: “Low Blow”

Static SA3 radar.

Replaces previous weather cover radome.

Acquisition / Early Warning Radars

P-12 | NATO: “Spoon Rest” Acquisition Radar

Enter this into the vehicle's INIT to place the vehicle with the radar mast raised:

```
_scr = [this] execVM "\pook_P12\data\scripts\raise_radar.sqf";
```

Enter this in the vehicle’s INIT field to place the un-hide the camo net deployed:

```
this animate ["camonet", 0];
```

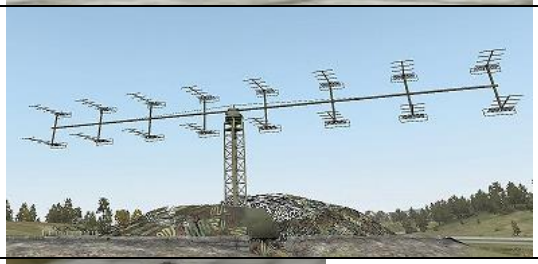
P-18 | NATO: “Spoon Rest-D” Acquisition Radar

Enter this into the vehicle's INIT to place the vehicle with the radar mast raised:

```
_scr = [this] execVM "\pook_P12\data\scripts\raise_radar.sqf";
```

Enter this in the vehicle’s INIT field to place the un-hide the camo net deployed:

```
this animate ["camonet", 0];
```



PRV-11 Height-Finding Radar

S-300 PS | NATO: SA-10B “GRUMBLE”

INTENDED USE: All-aspect SAM

The extensive performance envelope of the system and its advanced radar systems make it roughly equivalent to the Patriot systems, but on a self-propelled mobile platform. The system's capabilities are impressive and should not be under-rated.

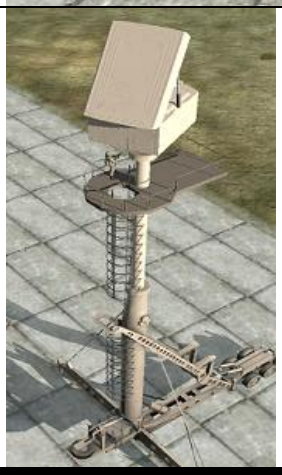
- The S-300 system is a long-range engagement system that can serve both strategic and tactical air defense needs. The system consists of the 5P85S semi-autonomous and 5P85D supplementary mobile launchers.
- The system relies upon the 30N6E (NATO: "Flap Lid") radar system for missile guidance and tracking, and the 76N6 "Clam Shell" acquisition radar systems. While other radar systems are employed, in-game the 76N6 and 30N6E are simulated.
- The in-game capabilities of the S-300 are most closely associated with the S-300PS (NATO: SA-10B) system. Other system improvements exist, e.g. SA-10A, SA-10C, etc. and may be simulated in future updates. For now, however, only the SA-10B system is simulated.

FEATURES:

- The S-300 system is intended for use in a deployed site scenario.
- The addon’s site spawner will spawn an SA-10 site that includes these SA-10 vehicles: 5P85S Launcher, 5P85D Launcher, 30N6E Mobile Radar, 76N6 mast-mounted Radar, and 30N6E mast-mounted Radar, and MAZ-7910 support trucks.
- The MAZ-7910 support trucks currently don’t have any reload/rearm capabilities.
- All default factions on all three sides (West, East, and Independent) are represented.
- Mast radar arrays are named by their representative faction colors. Since the mast radar units are empty they don't technically "belong" to a faction. Therefore any mast radar array can be interchanged to suit any terrain/color combination.
- Launch sounds taken from real-world data and video footage.

UNITS:

Launch Vehicles	
5P85S S300PS | NATO: SA-10B Semi-autonomous version. Note this version has the launcher control station directly behind the driver cab and can operate in a partial autonomous mode.	

5P85D S300PS | NATO: SA-10B “Supplementary” non-autonomous version. Note this version has no launcher control station directly behind the driver cab and can NOT operate in a partial autonomous mode. It depends completely on the engagement radar for missile guidance.	
Engagement / Targeting Radars	
30N6E Vehicle | NATO: “Flap Lid” radar Mobile SA10 radar	
30N6E Mast | Static SA10 radar Found under “Structures” > “Air Defense – SAM”	
Acquisition / Early-warning Radar	
76N6 Mast | NATO: “Clam Shell” radar Static SA-10 / SA-20 Radar Found under “Structures” > “Air Defense – SAM”	

S-300 PMU2 “FAVORIT” | NATO: SA-20B “GARGOYLE”

INTENDED USE: All-aspect SAM

S-300PMU2 “Favorit” (NATO: SA-20 “Gargoyle”) is an evolution of the S-300 (SA-10) system with changes significant enough to warrant a new designation beyond the S-300 PS. The components and electronics have been upgraded for better performance and extended operating range. Like the SA-10, the enhanced performance envelope of the system and its advanced radar systems make it roughly equivalent to, or in this case better than, the Patriot systems, but on a self-propelled mobile platform. The S-300 PMU2 is arguably closer to the THAADS system, or the Patriot PAC-3 Air Defense system in performance.

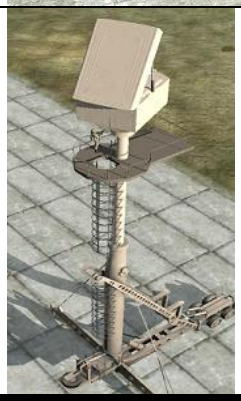
- The S-300 PMU2 system is a long-range engagement system that can serve both strategic and tactical air defense needs. The system consists of the 5P85TE Towed Transporter-Erector-Launcher (TEL).
- The system relies upon the 30N6E2 (NATO: "Tomb Stone") radar system for missile guidance and tracking, and the 96L6 "Clam Shell" acquisition radar systems. The 30N6E2 is an upgraded version of the SA-10’s 30N6E “Flap Lid” radar. While other radar systems are employed, in-game the 96L6 and 30N6E2 are simulated.
- The in-game capabilities of the system are most closely associated with the S-300 PMU2 (NATO: SA-20B) system. Other system improvements exist, e.g. SA-20A, etc. and may be simulated in future updates.

FEATURES:

- The S-300 PMU2 system is intended for use in a deployed site scenario. There are no provisions for self-propelled or autonomous launcher versions.
- The addon’s site spawner will spawn an SA-20 site that includes these SA-20 vehicles: 5P85TE TEL, 30N6E2 Mobile Radar, 76N6 mast-mounted Radar, and 96L6 mast-mounted Radar.
- The MAZ-7910 support trucks currently don’t have any reload/rearm capabilities. They are eye candy for now.
- All default factions on all three sides (West, East, and Independent) are represented.
- Mast radar arrays are named by their representative faction colors. Since the mast radar units are empty they don't technically "belong" to a faction. Therefore any mast radar array can be interchanged to suit any terrain/color combination.
- Launch sounds taken from real-world data and video footage.

UNITS:

Launch Vehicles	
5P85TE S-300 PMU2 | Towed Transporter-Erector-Launcher (TEL) unit. (NATO: SA-20B). Functions as static launcher in-game.	

Engagement / Targeting Radars	
30N6E2 Vehicle | Mobile SA-20 radar (NATO: “Tomb Stone”)	
96L6 Mast | Static SA-20 radar (NATO: “Cheese Board”) NOTE: Uses 30N6 model at present! Found under “Structures” > “Air Defense – SAM”	
Acquisition / Early-warning Radar	
76N6 Mast | Static SA-10 / SA-20 Radar Found under “Structures” > “Air Defense – SAM”	
64N6 Static S-300 | NATO: “Big Bird” SA-20 Radar Found under “Structures” > “Air Defense – SAM”	
91N6 Static S-400 / S-500 Radar | NATO: “Big Bird” SA-21 Radar Note: 91N6 is a series improvement over the 64N6 radar. The S-400 is designation for S-300 PMU-3 series evolution. Found under “Structures” > “Air Defense – SAM”	

BUK FAMILY: 9K37, 9K37M2 / 9K317, 9K317M2 / 9K317M3 | NATO: SA11 “GADFLY” / SA17 “GRIZZLY”

INTENDED USE: Short-Medium range SAM

- The BUK (English: Birch) family launch systems are an intermediate-range defense system intended for defense of military assets including military vehicles and troops.
- The systems consist of a mobile launcher with 4x missiles (6x missiles for 9K317M3). They are intended to accompany mobile tank and mounted infantry divisions.
- Since the launch vehicles are autonomous in that they carry their own engagement radars, they may be employed as standalone vehicles, or added to convoys, bases, etc.

FEATURES:

- The 9K37 (NATO: SA11) is a tracked vehicle containing 4x missiles, and is considered a series replacement for the original 2K12 (NATO: SA6) system. NOTE: the SA6 is not present in this addon.
- The 9K317 (NATO: SA17) is an upgrade of the 9K37 system. This uses a new missile design, and improved engagement radar.
- The “-M2” designator for both 9K37 (NATO: SA11), and 9K317 (NATO SA17) indicates further improvements to both systems in both performance and missile ranges. The wheeled versions represent the "-M2" models.
- The 9K317-M3 is a newly introduced platform consisting of a sealed missile container with 6x missiles, which is markedly different than earlier models.
- The 9K317-M3 performance is claimed to be “95% effective” and is compared to the SA-10 system performance, which likely makes it comparable to the MIM-104 Patriot PAC-3 missile. It is not yet clear if the –M3 version is intended for SHORAD point defense duties.
- All of the BUK family systems can benefit from the 9S36 mast-mounted radar array (NATO: “Chair Back”). This array acts as a “buddy system” to the launch vehicles, and raises the engagement radar high enough to minimize ground clutter feedback.
- The BUK family also contains launch vehicles that are incapable of autonomous guidance; however these are not present in the addon at this time.

UNITS:

Launch Vehicles	
9K37 Buk | NATO: SA-11	
9K37-M2 Buk | NATO: SA-11M2	

9K317 | NATO: SA-17	
9K317-M2 | NATO: SA-17M2	
9K317-M3 Buk | NATO: SA-17M3	
Engagement / Targeting Radar	
9S36 | Mobile SA-11/SA-17 radar | NATO: “Chair Back”	

9K331/9K332 “TOR” (THOR) | NATO: SA-15 “GAUNTLET”

INTENDED USE: Short-range Air Defense (SHORAD)

- The SA15 system is intended to be a SHORAD system near airbases and other high value assets, such as an SA-10 site.
- The system is intended for defense against aircraft, helicopters, cruise missiles, and other precision guided weapons.

FEATURES:

- The system consists of a mobile launcher containing 8x or 16x missiles that are vertically launched from the turret.
- Both tracked and wheeled models are present.
- The 9K332 represents an incremental upgrade of the missile system, and is represented as the wheeled version in the addon. The improved missile is smaller than its predecessor which allows the magazine to hold 16 rounds over the 8 round capacity of the previous version.
- The 9K332 missile has a slightly better range, and engagement capabilities.
- Both systems can target certain types of incoming ordnance such as precision guided munitions. This is useful for perimeter defense scenarios around high value assets.
- Launch sounds, vertical launch behavior, and launch smoke are based on real life launch footage.
- Vertical launch behavior is based on Gnat’s vertical launch script. MP behavior is not guaranteed.

UNITS:

Launch Vehicles	
9K331 Tor | NATO: SA-15 Chinese PLA Designation: “HQ-17”	
9K332 Tor M2 | NATO: SA-15	

2S6M “TUNGUSKA” | NATO: SA-19 “GRISON”

INTENDED USE: Short-range Air Defense (SHORAD)

- The SA19 system is intended to be a SHORAD system near airbases and other high value assets, such as a SAM site or airfield.
- The system is expected to engage “closer” targets where its lethality is greatly increased.
- The system is intended for fast acquisition and defense against “pop-up” targets such as helicopters, low-flying aircraft, remote piloted vehicles (RPV’s), cruise missiles, and other precision guided weapons.
- The system can target certain types of incoming ordnance such as precision guided munitions. This is useful for perimeter defense scenarios around high value assets.

FEATURES:

- The 2S6 consists of the standard 30mm 2A38M autocannon, and 8x missiles on a tracked chassis.
- The missiles are two-stage missiles with a high-velocity booster stage designed to rapidly engage low flying targets.
- User-switchable foliage camo.
- New driver view hatch.

UNITS:

Launch Vehicle	
2S6M “Tunguska” | NATO: SA-19	

96K6 “PANTSIR” S1 | NATO: SA-22 “GREYHOUND”

INTENDED USE: Short-range Air Defense (SHORAD)

- The SA22 system is intended to be a SHORAD system near airbases and other high value assets, such as an SA-10 site.
- The 96K6 is a series improvement of the 2S6 Tunguska (NATO: SA19) SHORAD point defense system. Therefore it is expected to engage “closer” targets where its lethality is greatly increased.
- The system is intended for fast acquisition and defense against “pop-up” targets such as helicopters, low-flying aircraft, remote piloted vehicles (RPV’s), cruise missiles, and other precision guided weapons.
- The system can target certain types of incoming ordnance such as precision guided munitions. This is useful for perimeter defense scenarios around high value assets.

FEATURES:

- The 96K6 consists of the standard 30mm 2A38M autocannon, and 12x missiles on a wheeled chassis.
- The missiles are two-stage missiles and are improved over the 2S6 Tunguska in both range and performance.
- The vehicle contains a spare and can repair from tire damage.

UNITS:

Launch Vehicle	
96K6 Pantsir S1 | NATO: SA-22	

US / NATO IADS SYSTEMS

These systems are grouped based on NATO use. In-game, both West and Independent sides will have access to these systems.

MEADS

The Medium Extended Air Defense System (MEADS) is a development of the PAC-3 (Patriot Advanced Capability-3) missile system on a mobile platform. It is roughly equivalent to the Russian 9K317 (SA-17) platform in capability and mobility. The MEADS was recently adopted by the German Defense forces.

INTENDED USE: Short-Medium range SAM

- The MEADS system is a medium- to long-range system based on the PAC-3 missile platform.
- MEADS can be employed as either a SHORAD point-defense system or as a mid-range engagement system.
- MEADS is being adopted by several countries worldwide, including Germany.

FEATURES:

- MEADS is based the proven PAC-3 missile platform, capable of intercepting not only aircraft, but also newer threats such as RPV's, cruise missiles, SSBM's, and other precision-guided threats.
- The launch system in-game is mobile, and consists of a mobile launcher armed with an 8x PAC-3 missile launcher.
- In-game, no radar system is currently modelled. The launch vehicle can guide the missiles autonomously. While not realistic, it provides the same type of mobile defense system as the Buk SA-11/SA-17 family of mobile SAM systems.
- The Commander turret consists of a .50 cal M2 for short-range defense.
- The vehicle can employ its spare tire to repair damage, and has room for one passenger besides the crew.
- The in-game vehicle turret swivels toward the threat, although the Real Life version is a fixed deployment system similar to the S-300 (SA-10) launch vehicles. This was done to facilitate better in-game use by the AI.

UNITS:

Launch Vehicles	
MEADS (PAC-3) Mobile Launcher	

MIM-23 "HAWK"

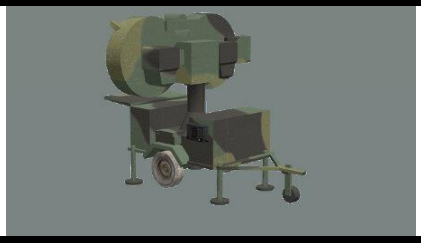
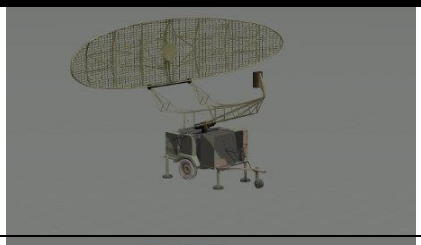
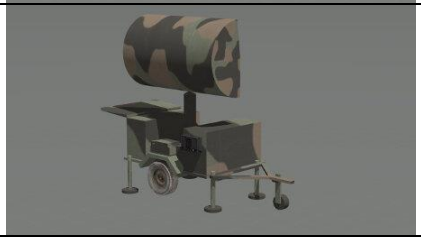
INTENDED USE: Short-Medium range SAM

- The HAWK (Homing All the Way Killer) SAM is a short- to mid-range system produced by Raytheon on a 3-round launcher.
- HAWK system upgrades are currently ongoing by several countries worldwide, including the I-HAWK and XXI HAWK.

FEATURES:

- In-game simulation is based on the I-HAWK (Improved HAWK) platform. The HAWK XXI variation may be added in the future.

UNITS:

Launch Vehicles	
MIM-23 (HAWK) Static Launcher	
Engagement / Targeting Radar	
AN/MPQ-61 | HAWK High Power Illuminating Radar (HPIR)	
Control Station	
HAWK BCP (Battery Command Post) control station	
Acquisition / Early-warning Radars	
AN/MPQ-50 | Pulse Acquisition Radar (PAR)	
AN/MPQ-62 | Continuous-Wave Acquisition Radar (CWIR)	

NASAMS

INTENDED USE: Short-Medium range SAM

- The NASAMS system is a short- to mid-range system produced by Raytheon.
- NASAMS can be employed as a SHORAD point-defense system and as a mid-range engagement system.
- NASAMS is employed by several countries worldwide.

FEATURES:

- NASAMS is based the proven AIM-120 missile that has been adapted for surface launch.
- The launch system can be either static or mobile, and consists of a mobile 6x AIM-120 missile launcher.
- Mobile launch vehicle also features commander turret with .50 cal M2 for close support.
- NASAMS utilizes the AN/MPQ-64 radar system.

UNITS:

Launch Vehicles	
NASAMS (AIM-120) Mobile Launcher	
NASAMS (AIM-120) Static Launcher	
Engagement / Targeting Radar	
AN/MPQ-64 | Static NASAMS radar	

C-RAM

INTENDED USE: Short-range Air Defense (SHORAD)

The C-RAM system is a short-range area defense system intended to counter rocket, artillery, and mortar attacks (C-RAM). Since this is currently not practical in-game, it is perfectly suited for short-range air defense. Counter-engagements are being researched.

FEATURES:

- Mobile platform with Palanx CIWS 20mm gatling gun.
- Uses HEI airburst ammunition.
- Commander turret with .50 cal M2 for close support.

UNITS:

Launch Vehicles	
C-RAM (CIWS ADS) Mobile System	

MIM-104 “PATRIOT”

The Patriot system's capabilities are impressive and should not be under-rated. Both PAC-2 and the newer PAC-3 systems are simulated.

INTENDED USE: All-aspect SAM

- The Patriot system family consists of several missile platforms each with a specific purpose.
- The PAC-2 is the "standard" mid- to long-range engagement missile can serve both strategic and tactical air defense goals.
- The PAC-3 serves more as the "point-defense" role to engage closer targets that pose immediate threats to friendly assets.
- The AN/MPQ-53 phased array radar that represents a breakthrough radar enhancement compared to earlier radar designs.

FEATURES:

- Both the PAC-2 and PAC-3 systems are represented as static launchers.
- The AN/MPQ-53 radar and OE-349 antenna mast group are also included.
- The launchers can carry up to 4x PAC-2 missiles, or up to 16 PAC-3 missiles. These are usually employed in groups to provide greater coverage and versatility.
- Both PAC-2 and PAC-3 batteries can be individually placed, as can the radar arrays.
- The MIM-104 PAC-2 site spawner will consist of PAC-2 batteries. Point defense will normally be MANPAD’s.

UNITS:

Launch Vehicles	
MIM-104 Patriot system (PAC-2)	
MIM-104 Patriot system (PAC-3)	
Engagement / Targeting Radar	
AN/MPQ-53 | Static MIM104 Patriot radar	
Acquisition / Early-warning Radar	
OE349 | MIM104 Patriot Static Radar Found under “Structures” > “Air Defense – SAM”	

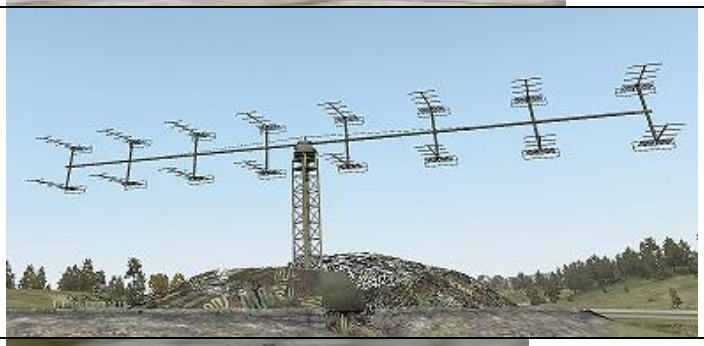
AAA SYSTEMS OVERVIEW

AAA site spawners will generate:

- 1x central radar vehicle.
- 1x-2x secondary acquisition radar(s).
- 4x-6x AAA batteries and support vehicles.

AAA Acquisition / Early-warning Radars	

P-12 | NATO: “Spoon Rest” Acquisition Radar
 	
Enter this into the vehicle's INIT to place the vehicle with the radar mast raised:
`_scr = [this] execVM "\pook_P12\data\scripts\raise_radar.sqf";`
 	
Enter this in the vehicle’s INIT field to place the un-hide the camo net deployed:
`this animate ["camonet", 0];`
	

P-18 | NATO: “Spoon Rest-D” Acquisition Radar
 	
Enter this into the vehicle's INIT to place the vehicle with the radar mast raised:
`_scr = [this] execVM "\pook_P12\data\scripts\raise_radar.sqf";`
 	
Enter this in the vehicle’s INIT field to place the un-hide the camo net deployed:
`this animate ["camonet", 0];`
	

PRV-11 Height-Finding Radar | NATO: “Side Net”	

SON-9A / ZU/ZSU/ZPU SITE

INTENDED USE:

The SON-9 targeting radar supports “typical” AAA air defense sites of 23mm batteries. AAA batteries can be slaved to the radar system for enhanced targeting. Without the radar, AAA batteries will be more limited in their engagement capabilities.

FEATURES:

- The site will be based on the centrally located SON-9 targeting radar.
- Secondary acquisition radar(s)
- 4x AAA main batteries. AAA batteries will be a random mixture of Zu-23 and ZPU-4 units.
- A random “point defense” asset such as a MANPAD.

UNITS:

AAA Batteries	
Also SUPPORTED: - RangeMaster ZSU-4 (Arma2)	
Chinese PLA Designation: “Type 85” SUPPORTED: - ZSU-23-4 “Shilka”, RangeMaster Shilka - ZU-23 23mm static battery - ZU-23 AAA, RangeMaster ZU-23	
Engagement / Targeting Radar	
SON-9 | ZU-23 / ZPU-4 Site Radar | NATO: “Fire Can” Enter this in the vehicle’s INIT field to place the un-hide the camo net deployed: `this animate ["camonet", 0];`	

PUAZO 6-60 / ZU/ZSU/ZPU SITE

INTENDED USE:

The PUAZO 6/60 targeting rangefinder is a passive system that supports “typical” AAA air defense sites of 23mm batteries. AAA batteries can be slaved to the PUAZO system for enhanced targeting. Without the radar, AAA batteries will be more limited in their engagement capabilities. Since the PUAZO 6/60 is a completely passive system, it will be undetectable by anti-radiation missiles or other locking systems. PUAZO sites may be completely undetectable until they open fire.

FEATURES:

- The site will be based on the centrally located SON-9 targeting radar.
- Secondary acquisition radar(s)
- 4x AAA main batteries. AAA batteries will be a random mixture of Zu-23 and ZPU-4 units.
- A random “point defense” asset such as a MANPAD.

UNITS:

AAA Batteries	
SUPPORTED: - RangeMaster ZSU-4 (Arma 2)	
Chinese PLA Designation: “Type 85” SUPPORTED: - ZSU-23-4 “Shilka”, RangeMaster Shilka - ZU-23 23mm static battery - ZU-23 AAA, RangeMaster ZU-23	
Engagement / Targeting Radar	
PUAZO 6/60 Rangefinder | Passive AAA Targeting System	

SON-50 / S-60 SITE

INTENDED USE:

The SON-50 targeting radar supports the longer range 57mm S-60 AAA air defense batteries. S-60 batteries can be slaved to the radar system for enhanced targeting. Without the radar, AAA batteries will be more limited in their engagement capabilities.

FEATURES:

- The site will be based on the centrally located SON-50 targeting radar.
- Secondary acquisition radar(s)
- 4x AAA main S-60 57mm batteries.
- A random “point defense” asset such as a MANPAD.

UNITS:

AAA Batteries	
S-60 57mm static battery Chinese PLA Designation: “Type 59”	
Engagement / Targeting radar	
SON-50 | S-60 AA Site Radar | NATO: “Flap Wheel”	

PU-12 / ZSU SITE

INTENDED USE:

The PU-12 radar serves as a control center for ZSU-23-4 / SA-9 / SA-13 units. These units are typically employed for short-range defense surrounding SA-6 sites. The batteries can be slaved to the radar system for enhanced targeting. Without the radar, the batteries will be more limited in their engagement capabilities.

FEATURES:

- The site will be based on the centrally located PU-12 targeting radar.
- Secondary acquisition radar(s)
- 4x AAA main batteries.
- A random “point defense” asset such as a MANPAD.

UNITS:

Supported Batteries	
pook_AFV 9K31 (SA-9) Arma2: FZA_SA9, RangeMaster SA-9	
ZSU-23-4	
ZSU-23-4M4. Upgraded system with better electronics package and 6x Strela-class launchers.	
Engagement / Targeting Radar	
PU-12 (9S482/9S482M) Built on the BTR-60 chassis with retractable antenna	

SON-9 / PUAZO | KS-12 / KS-19 SITE

INTENDED USE:

The KS-12 / KS-19 site provides high caliber (85mm-100mm) AAA coverage. The batteries employ the standard SON-9 or PUAZO 6/60 targeting solutions. Without the radar, the batteries will be more limited in their engagement capabilities. Standard range for radar-supported units is 10.5km, and range for no radar support is 4km. Currently only 4km range is simulated.

FEATURES:

- The site will be based on the centrally located SON-9 or PUAZO 6/60 targeting solutions.
- Secondary acquisition radar(s)
- 6x AAA main batteries.
- A random "point defense" asset such as a MANPAD.

UNITS:

Supported Batteries	
KS-12 85mm AAA battery Chinese PLA Designation: "Type 72"	
KS-19 100mm AAA battery. Visual difference between KS-19 and KS-12 is the addition of a blast shield on KS-19, and a larger muzzle brake. The same chassis is used on both systems. Chinese PLA Designation: "Type 55"	

FUTURE CONSIDERATIONS

Some things being considered for possible inclusion in future updates:

- Better sound for CRAM?
- Boeing HEL High-Energy Laser system
- S300 command vehicle?
- Research anti-SSBM/anti-SCUD intercept options for game.
- THAADS system?
- David's Sling system?
- IRIS-T land based system?
- More "Midlife upgrade" systems (3rd world systems)?

DISCLAIMER

- New models based on Arma1/Arma2 sample models; therefore you are bound by the sample model EULA restrictions.
- This mod is ONLY for use with BIS games!
- You are not allowed to decompile, reverse engineer, or otherwise derive content from this addon.
- You are free to enjoy it in its original form in accordance with the BIS EULA!
- No one may charge for, or receive financial compensation for use of, or access to, any part of this addon in any way or form, including "perk"-based access, and especially no use is permitted on "life" servers.
- Requests for commercial / military use, please contact me via email: HCPOOKIE@HOTMAIL.COM

KNOWN ISSUES

- SAM launchers will sometimes engage targets that are behind mountains. This is a limitation of the game engine and cannot be avoided. Some script solutions are being implemented on the site spawners to limit this behavior.
- Textures could be improved. Any texture artists out there?
- Stringtables created via online translator, so they may be somewhat humorous.
- Missile engagement ranges based on real-world data. Game engine limitations restrict the ranges, making long-range engagements incredibly limited. Note that use of the site spawner units and AR missiles will negate the range limitations!

CREDITS AND THANKS

- Thanks to BIS for the Armaverse!
- Sa8gecko for the original 30N6E model and original 30N6E/SA10 textures. I built the new textures and RVMATS from these.
- Credit to Gnat for the original missile vertical launch script.
- CUP dev group for math assistance
- "Hand of Moscow" for the original 64N6E (SA-20 radar) model. Serjames for 64N6E (SA-20 radar) MLOD collaboration.
- Cycle6 for VME PLA collaboration.
- Mod by hcpookie - e-mail: hcpookie@hotmail.com

Version 3.x-specific (Arma2 version) credits:

- Credit to FRL_myke for the SA17 texture in the FRL_missilebox, as well as AIM120 model and other supporting files.
- Credit to Eggbeast and team for allowing access to the missilebox via the RangeMaster pack!
- Credit to Eddie for allowing Rangemaster update of his ZPU-4!

REFERENCES

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- Soviet Radars: http://users.sch.gr/dlabaditis/TH/radars/index.htm
- Russian Air Defense Radars: http://fas.org/man/dod-101/sys/missile/row/radar-rus.htm
- Russian / ROW Missile Systems: http://fas.org/man/dod-101/sys/missile/row/index.html
- Air Defense Page: http://www.gulflink.osd.mil/irfna/irfna_refs/n28en030/airdef.html
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- Rosoboron export (milparade) catalogs: http://www.roe.ru/news/eng_news.html
- Janes' 360 Defense & Security Intelligence & Analysis online: http://www.janes.com
- SAMSIM Sam Simulator: http://sites.google.com/site/samsimulator1972/home
- IEEE Standards Association: Radar-Frequency Bands http://standards.ieee.org/findstds/standard/521-2002.html

An enemy 9K331 SA-15 site will always make for a bad day…

INSTALLATION | DEPENDENCIES | PACKAGE CONTENTS

Arma3 support is now the primary focus. Legacy use in Arma2 is no longer supported.

I strongly recommend the use of a download manager such as “Play with Six” or other similar manager, which will enable automatic updates and help facilitate installation.

For direct installation and updates: Extract the @POOK folder into your Arma3 folder. The PBO and “Sign” files are in the archive. While there are other ways to launch the mod, I recommend you edit your startup shortcut to include:

"-mod=@POOK;"

For more information about addon folders please check BIS Wiki here:

http://community.bistudio.com/wiki/Addons#ArmA_2

I regret that I cannot support installation errors. Please reach out to the community support forums if you need assistance configuring custom startup parameters.

DEPENDENCIES

Arma3 Versions: New in v4.x (the Arma3 version): This addon only requires my “camo nets” addon. You can find the camo nets download here:

https://forums.bistudio.com/topic/186395-pook-camonets/

http://www.armaholic.com/page.php?id=29908

The use of the CUP mod is now optional to accommodate incompatible non-CUP factions. Please see the ‘contents’ section below for further information. The externally supported factions can be found here:

CUP: http://cup-arma3.org/

VME PLA: https://forums.bistudio.com/topic/192618-from-china-virtual-military-engineers-vme-pla-mod-for-arma3/

LEGACY Arma2 Versions: The v3.x (Arma 2 version): The Arma2 versions (v3.x) require the Rangemaster mod for some essential FRL_Missilebox components and various items too numerous to mention. The Rangemaster mod is located here:

http://forums.bistudio.com/showthread.php?181303

http://www.armaholic.com/page.php?id=26409

CONTENTS

46 files… 992 MB… and counting…

NEW: External factions (such as CUP) are now supported as an option. This facilitates the use of “vanilla” BIS factions without external support. This change was made to accommodate non-CUP factions such as FAP, VME, RHS, etc.

EXTERNAL SUPPORT FILES:

These optional files are for use with external mods such as CUP. If you do not use these external mods, you do not need these files!

Note: The use of these files without their "parent" mods will cause numerous pop-up errors in the game! Therefore only add these files if the external mods are running. The updated release of this mod has been play-tested to ensure no pop-up errors happen in the "vanilla" game.

Therefore if you do receive pop-up errors in the game, you should check to see if you accidentally added these mod files without their parent mod.

CUP

\@POOK\Addons\pook_SAM_CUP.pbo
\@POOK\Addons\pook_SAM_CUP.pbo.pook_v2.bisign

VME PLA

\@POOK\Addons\pook_SAM_PLA.pbo
\@POOK\Addons\pook_SAM_PLA.pbo.pook_v2.bisign

CORE FILES

\@POOK\pook_sam_guide.pdf
\@POOK\POOK.bikey (* pook_bikey also available for download on ofpec.com)

\@POOK\Addons\FgS_64N6E.pbo
\@POOK\Addons\FgS_64N6E.pbo.pook_v2.bisign
\@POOK\Addons\pook_76N6.pbo
\@POOK\Addons\pook_76N6.pbo.pook_v2.bisign
\@POOK\Addons\pook_CRAM.pbo
\@POOK\Addons\pook_CRAM.pbo.pook_v2.bisign
\@POOK\Addons\pook_MEADS.pbo
\@POOK\Addons\pook_MEADS.pbo.pook_v2.bisign
\@POOK\Addons\pook_MIM23.pbo
\@POOK\Addons\pook_MIM23.pbo.pook_v2.bisign
\@POOK\Addons\pook_MIM104.pbo
\@POOK\Addons\pook_MIM104.pbo.pook_v2.bisign
\@POOK\Addons\pook_P12.pbo
\@POOK\Addons\pook_P12.pbo.pook_v2.bisign
\@POOK\Addons\pook_PU12.pbo
\@POOK\Addons\pook_PU12.pbo.pook_v2.bisign
\@POOK\Addons\pook_S60.pbo
\@POOK\Addons\pook_S60.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA2.pbo
\@POOK\Addons\pook_SA2.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA3.pbo
\@POOK\Addons\pook_SA3.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA10.pbo
\@POOK\Addons\pook_SA10.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA11.pbo
\@POOK\Addons\pook_SA11.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA15.pbo
\@POOK\Addons\pook_SA15.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA19.pbo
\@POOK\Addons\pook_SA19.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA20.pbo
\@POOK\Addons\pook_SA20.pbo.pook_v2.bisign
\@POOK\Addons\pook_SA22.pbo
\@POOK\Addons\pook_SA22.pbo.pook_v2.bisign
\@POOK\Addons\pook_SAM.pbo
\@POOK\Addons\pook_SAM.pbo.pook_v2.bisign
\@POOK\Addons\pook_SON9.pbo
\@POOK\Addons\pook_SON9.pbo.pook_v2.bisign
\@POOK\Addons\pook_ZSU.pbo
\@POOK\Addons\pook_ZSU.pbo.pook_v2.bisign

APPENDIX: CLASSNAMES

Complete listing of all class names in this addon.

NOTE: PLA units require VME PLA. CUP units require CUP.

SITE SPAWN CLASSNAMES

Now found under class "Air Defense - Sites". More sites and variations may be considered for future implementation.

SAM SITES

SA20 SAM Site Spawner		
pook_SA20_spawnerOPFOR	OPFOR AAF	EAST
pook_SA20_spawnerBLUFOR	NATO	WEST
pook_SA20_spawnerGUEFOR	AAF	Independent
pook_SA20_spawnerRU	Russian	EAST
pook_SA20_spawnerTAK	Takistani	EAST
pook_SA20_spawnerINS	ChDKZ	EAST
pook_SA20_spawnerTKINS	Takistani Militia	EAST
pook_SA20_spawnerCDF	CDF	WEST
pook_SA20_spawnerCDF_IND	CDF	Independent
pook_SA20_spawnerGUE	GUE	Independent
pook_SA20_spawnerTKGUE	TAK-Locals	Independent

SA10 SAM Site Spawner		
pook_SA10_spawnerOPFOR	OPFOR AAF	EAST
pook_SA10_spawnerBLUFOR	NATO	WEST
pook_SA10_spawnerGUEFOR	AAF	Independent
pook_SA10_spawnerRU	Russian	EAST
pook_SA10_spawnerTAK	Takistani	EAST
pook_SA10_spawnerINS	ChDKZ	EAST
pook_SA10_spawnerTKINS	Takistani Militia	EAST
pook_SA10_spawnerCDF	CDF	WEST
pook_SA10_spawnerCDF_IND	CDF	Independent
pook_SA10_spawnerGUE	GUE	Independent
pook_SA10_spawnerTKGUE	TAK-Locals	Independent
pook_SA10_spawnerPLA	VME PLA	Independent

SA3 SAM Site Spawner		
pook_SA3_spawnerOPFOR	OPFOR AAF	EAST
pook_SA3_spawnerBLUFOR	NATO	WEST
pook_SA3_spawnerGUEFOR	AAF	Independent
pook_SA3_spawnerRU	Russian	EAST
pook_SA3_spawnerTAK	Takistani	EAST
pook_SA3_spawnerINS	ChDKZ	EAST
pook_SA3_spawnerTKINS	Takistani Militia	EAST
pook_SA3_spawnerCDF	CDF	WEST
pook_SA3_spawnerGUE	NAPA GUE	Independent
pook_SA3_spawnerTKGUE	TAK-Locals	Independent

SA2 SAM Site Spawner		
pook_SA2_spawnerOPFOR	OPFOR AAF	EAST
pook_SA2_spawnerBLUFOR	NATO	WEST
pook_SA2_spawnerGUEFOR	AAF	Independent
pook_SA2_spawnerTAK	Takistani	EAST
pook_SA2_spawnerINS	ChDKZ	EAST
pook_SA2_spawnerTKINS	Takistani Militia	EAST
pook_SA2_spawnerCDF	CDF	WEST
pook_SA2_spawnerGUE	NAPA GUE	Independent
pook_SA2_spawnerTKGUE	TAK-Locals	Independent
pook_SA2_spawnerPLA	VME PLA	Independent

MIM104 SAM Site Spawner		
pook_MIM104_spawnerBLUFOR	NATO	WEST
pook_MIM104_spawnerGUEFOR	AAF	Independent
pook_MIM104_spawnerUSMC	USMC - Forest	WEST
pook_MIM104_spawnerUS	US Army - Desert	WEST
pook_MIM104_spawnerCDF	CDF - Forest	WEST
pook_MIM104_spawnerCDF_IND	CDF - Desert	Independent
pook_MIM104_spawnerGUE	NAPA GUE - Forest	Independent
pook_MIM104_spawnerTKGUE	TAK Locals – Desert	Independent

NASAMS SAM Site Spawner		
POOK_NASAMS_spawnerBLUFOR	NATO	WEST
POOK_NASAMS_spawnerGUEFOR	AAF	Independent
POOK_NASAMS_spawnerUSMC	USMC - Forest	WEST
POOK_NASAMS_spawnerUS	US Army - Desert	WEST
POOK_NASAMS_spawnerCDF	CDF - Forest	WEST
POOK_NASAMS_spawnerCDF_IND	CDF - Desert	Independent
POOK_NASAMS_spawnerGUE	NAPA GUE - Forest	Independent
POOK_NASAMS_spawnerTKGUE	TAK Locals – Desert	Independent

MIM23 SAM Site Spawner		
pook_HAWK_spawnerBLUFOR	NATO	WEST
pook_HAWK_spawnerGUEFOR	AAF	Independent
pook_HAWK_spawnerOPFOR	OPFOR AAF	EAST
pook_HAWK_spawnerUSMC	USMC	WEST
pook_HAWK _spawnerUS	US	WEST
pook_HAWK _spawnerTAK	Takistani	EAST
pook_HAWK _spawnerINS	ChDKZ	EAST
pook_HAWK _spawnerTKINS	Takistani Militia	EAST
pook_HAWK _spawnerCDF	CDF	WEST
pook_HAWK _spawnerCDF_IND	CDF	Independent
pook_HAWK _spawnerGUE	GUE	Independent
pook_HAWK _spawnerTKGUE	TAK-Locals	Independent

AAA SITES

SON50 / S60 AAA Site Spawner		
pook_SON50_spawnerOPFOR	AAF OPFOR	EAST
pook_SON50_spawnerBLUFOR	NATO	WEST
pook_SON50_spawnerGUEFOR	AAF	Independent
pook_SON50_spawnerRU	Russian	EAST
pook_SON50_spawnerTAK	Takistani	EAST
pook_SON50_spawnerINS	ChDKZ INS	EAST
pook_SON50_spawnerTKINS	Takistani Militia	EAST
pook_SON50_spawnerCDF	CDF – Forest	WEST
pook_SON50_spawnerCDF_IND	CDF – Desert	Independent
pook_SON50_spawnerGUE	NAPA GUE	Independent
pook_SON50_spawnerTKGUE	TAK GUE	Independent
pook_SON50_spawnerPLA	VME PLA	Independent

SON9 / ZSU\ZPU AAA Site Spawner		
pook_SON9_spawnerOPFOR	AAF OPFOR	EAST
pook_SON9_spawnerBLUFOR	NATO	WEST
pook_SON9_spawnerGUEFOR	AAF	Independent
pook_SON9_spawnerRU	Russian	EAST
pook_SON9_spawnerTAK	Takistani	EAST
pook_SON9_spawnerINS	ChDKZ INS	EAST
pook_SON9_spawnerTKINS	Takistani Militia	EAST
pook_SON9_spawnerCDF	CDF	WEST
pook_SON9_spawnerCDF_IND	CDF	Independent
pook_SON9_spawnerGUE	NAPA GUE	Independent
pook_SON9_spawnerTKGUE	TAK GUE	Independent
pook_SON9_spawnerPLA	VME PLA	Independent

PUAZO 6-60 / ZSU\ZPU AAA Site Spawner		
pook_PUAZO_spawnerOPFOR	AAF OPFOR	EAST
pook_PUAZO_spawnerBLUFOR	NATO	WEST
pook_PUAZO_spawnerGUEFOR	AAF	Independent
pook_PUAZO_spawnerRU	Russian	EAST
pook_PUAZO_spawnerTAK	Takistani	EAST
pook_PUAZO_spawnerINS	ChDKZ INS	EAST
pook_PUAZO_spawnerTKINS	Takistani Militia	EAST
pook_PUAZO_spawnerCDF	CDF	WEST
pook_PUAZO_spawnerCDF_IND	CDF	Independent
pook_PUAZO_spawnerGUE	NAPA GUE	Independent
pook_PUAZO_spawnerTKGUE	TAK Locals	Independent
pook_PUAZO_spawnerPLA	VME PLA	Independent

PU-12 / ZSU AAA Site Spawner		
pook_PU12_spawnerOPFOR	AAF OPFOR	EAST
pook_PU12_spawnerBLUFOR	NATO	WEST
pook_PU12_spawnerGUEFOR	AAF	Independent
pook_PU12_spawnerRU	Russian	EAST
pook_PU12_spawnerTAK	Takistani	EAST
pook_PU12_spawnerINS	ChDKZ INS	EAST
pook_PU12_spawnerTKINS	Takistani Militia	EAST
pook_PU12_spawnerCDF	CDF	WEST
pook_PU12_spawnerCDF_IND	CDF	Independent
pook_PU12_spawnerGUE	NAPA GUE	Independent
pook_PU12_spawnerTKGUE	TAK Locals	Independent

SON9 / KS-12\KS-19 AAA Site Spawner		
pook_KS12_spawnerOPFOR	AAF OPFOR	EAST
pook_KS12_spawnerBLUFOR	NATO	WEST
pook_KS12_spawnerGUEFOR	AAF	Independent
pook_KS12_spawnerRU	Russian	EAST
pook_KS12_spawnerTAK	Takistani	EAST
pook_KS12_spawnerINS	ChDKZ INS	EAST
pook_KS12_spawnerTKINS	Takistani Militia	EAST
pook_KS12_spawnerCDF	CDF	WEST
pook_KS12_spawnerCDF_IND	CDF	Independent
pook_KS12_spawnerGUE	NAPA GUE	Independent
pook_KS12_spawnerTKGUE	TAK GUE	Independent
pook_KS12_spawnerPLA	VME PLA	Independent

PUAZO 6-60 / KS-12\KS-19 AAA Site Spawner		
pook_PUAZO_KS12_spawnerOPFOR	AAF OPFOR	EAST
pook_PUAZO_KS12_spawnerBLUFOR	NATO	WEST
pook_PUAZO_KS12_spawnerGUEFOR	AAF	Independent
pook_PUAZO_KS12_spawnerRU	Russian	EAST
pook_PUAZO_KS12_spawnerTAK	Takistani	EAST
pook_PUAZO_KS12_spawnerINS	ChDKZ INS	EAST
pook_PUAZO_KS12_spawnerTKINS	Takistani Militia	EAST
pook_PUAZO_KS12_spawnerCDF	CDF	WEST
pook_PUAZO_KS12_spawnerCDF_IND	CDF	Independent
pook_PUAZO_KS12_spawnerGUE	NAPA GUE	Independent
pook_PUAZO_KS12_spawnerTKGUE	TAK Locals	Independent
pook_PUAZO_KS12_spawnerPLA	VME PLA	Independent

SAM LAUNCHER AND SUPPORT VEHICLE CLASSNAMES

Individual vehicle class names are found under “Air Defense – SAM”, or “Air Defense – AAA” depending on type. **NOTE:** PLA units require VME PLA. CUP units require CUP.

S-300 | SA-10

5P85S Launcher (Semi-autonomous)		
pook_5P85S_Base	AAF OPFOR	EAST
pook_5P85S_Base_IND	AAF	Independent
pook_5P85S_Base_BLUFOR	NATO	WEST
pook_5P85S_RU	Russian	EAST
pook_5P85S_TAK	Takistani	EAST
pook_5P85S_INS	ChDKZ INS	EAST
pook_5P85S_TKINS	Takistani Militia	EAST
pook_5P85S_CDF	CDF – Forest	WEST
pook_5P85S_CDF_IND	CDF – Desert	Independent
pook_5P85S_GUE	NAPA GUE	Independent
pook_5P85S_TKGUE	TAK-Locals	Independent
pook_5P85S_PLA	VME PLA	Independent

SP85D Launcher (Supplemental)		
pook_5P85D_Base	AAF OPFOR	EAST
pook_5P85D_Base_IND	AAF	Independent
pook_5P85D_Base_BLUFOR	NATO	WEST
pook_5P85D_RU	Russian	EAST
pook_5P85D_TAK	Takistani	EAST
pook_5P85D_INS	ChDKZ INS	EAST
pook_5P85D_TKINS	Takistani Militia	EAST
pook_5P85D_CDF	CDF – Forest	WEST
pook_5P85D_CDF_IND	CDF – Desert	Independent
pook_5P85D_GUE	NAPA GUE	Independent
pook_5P85D_TKGUE	TAK-Locals	Independent
pook_5P85D_PLA	VME PLA	Independent

30N6E Engagement Radar Vehicle		
pook_30N6E_Base	AAF OPFOR	EAST
pook_30N6E_Base_IND	AAF	Independent
pook_30N6E_Base_BLUFOR	NATO	WEST
pook_30N6E_RU	Russian	EAST
pook_30N6E_TAK	Takistani	EAST
pook_30N6E_INS	ChDKZ INS	EAST
pook_30N6E_TKINS	Takistani Militia	EAST
pook_30N6E_CDF	CDF – Forest	WEST
pook_30N6E_CDF_INDCDF	CDF – Desert	Independent
pook_30N6E_GUE	NAPA GUE	Independent
pook_30N6E_TKGUE	TAK-Locals	Independent
pook_30N6E_PLA	VME PLA	Independent

76N6 EWR/Acquisition Radar These empty vehicles are unmanned and therefore found under the “EMPTY” category. They are not faction-specific and can be interchanged for color/terrain options.		
pook_76N6_radar	NATO Desert Tan	
pook_76N6_radarCHDKZ	CHDKZ Green	
pook_76N6_radarCDF	CDF Forest Green / Brown	
pook_76N6_radarTAK	TAK Green / Sand	
pook_76N6_radarRUS	RUS Jungle	
pook_76N6_radarNATO	NATO Woodland	
pook_76N6_radarBROWN	DUALA Brown	

30N6E Mast-mounted Engagement Radar These empty vehicles are unmanned and therefore found under the "EMPTY" category. They are not faction-specific and can be interchanged for color/terrain options.		
pook_30N6E_radar	NATO Desert Tan	
pook_30N6E_radarCHDKZ	CHDKZ Green	
pook_30N6E_radarCDF	CDF Forest Green / Brown	
pook_30N6E_radarTAK	TAK Green / Sand	
pook_30N6E_radarRUS	RUS Jungle	
pook_30N6E_radarNATO	NATO Woodland	

MAZ7910 flatbed truck – these are technically trucks so all factions are present. The "CIV" models are available in CUP.		
pook_MAZ7910_base	AAF OPFOR	EAST
pook_MAZ7910_base_IND	AAF	Independent
pook_MAZ7910_base_BLUFOR	NATO	WEST
pook_MAZ7910_RU	Russian	EAST
pook_MAZ7910_TAK	Takistan	EAST
pook_MAZ7910_INS	ChDKZ INS	EAST
pook_MAZ7910_TKINS	TAK-Militia	EAST
pook_MAZ7910_CDF	CDF – Forest	WEST
pook_MAZ7910_CDF_IND	CDF – Desert	Independent
pook_MAZ7910_GUE	NAPA GUE	Independent
pook_MAZ7910_TKGUE	TAK-Locals	Independent
pook_MAZ7910_PMC	PMC	Independent
pook_MAZ7910_PMCWest	PMC	WEST
pook_MAZ7910_CIV	Civillian - Chernarus	CIV
pook_MAZ7910_CIVEuro	Civillian - Euro	CIV
pook_MAZ7910_PLA	VME PLA	Independent

S-300 PMU2 | SA-20

S-300 PMU2 Static Launcher		
pook_SA20_static_base	AAF OPFOR	EAST
pook_SA20_static_base_IND	AAF	Independent
pook_SA20_static_base_BLUFOR	NATO	WEST
pook_SA20_static_RU	Russian	EAST
pook_SA20_static_TAK	Takistani	EAST
pook_SA20_static_INS	ChDKZ INS	EAST
pook_SA20_static_TKINS	TAK Militia	EAST
pook_SA20_static_CDF	CDF – Forest	WEST
pook_SA20_static_CDF_IND	CDF – Desert	Independent
pook_SA20_static_GUE	NAPA GUE	Independent
pook_SA20_static_TKGUE	TAK Locals	Independent

30N6E2 Engagement Radar Vehicle		
pook_30N6E2_Base	AAF OPFOR	EAST
pook_30N6E2_Base_IND	AAF	Independent
pook_30N6E2_Base_BLUFOR	NATO	WEST
pook_30N6E2_RU	Russian	EAST
pook_30N6E2_TAK	Takistani	EAST
pook_30N6E2_INS	ChDKZ INS	EAST
pook_30N6E2_TKINS	Takistani Militia	EAST
pook_30N6E2_CDF	CDF – Forest	WEST
pook_30N6E2_CDF_INDCDF	CDF – Desert	Independent
pook_30N6E2_GUE	NAPA GUE	Independent
pook_30N6E2_TKGUE	TAK-Locals	Independent

91N6 EWR/Acquisition Radar These empty vehicles are unmanned and therefore found under the "EMPTY" category. They are not faction-specific and can be interchanged for color/terrain options.		
pook_91N6_radar	NATO Desert Tan	
pook_91N6_radarCHDKZ	CHDKZ Green	
pook_91N6_radarCDF	CDF Forest Green / Brown	
pook_91N6_radarTAK	TAK Green / Sand	
pook_91N6_radarRUS	RUS Jungle	
pook_91N6_radarNATO	NATO Woodland	
pook_91N6_radarBROWN	DUALA Brown	

9K331 / 9K332 | SA-15

9K331 Tracked		
pook_9K331_Root	AAF OPFOR	EAST
pook_9K331_Root_IND	AAF	Independent
pook_9K331_Root_BLUFOR	NATO	WEST
pook_9K331_Base	Russian	EAST
pook_9K331_TAK	Takistani	EAST
pook_9K331_INS	ChDKZ INS	EAST
pook_9K331_TKINS	TAK Militia	EAST
pook_9K331_CDF	CDF – Forest	WEST
pook_9K331_CDF_IND	CDF – Desert	Independent
pook_9K331_GUE	NAPA GUE	Independent
pook_9K331_TKGUE	TAK Locals	Independent
pook_9K331_PLA	VME PLA	Independent

9K332 Wheeled		
pook_9K332_Root	AAF OPFOR	EAST
pook_9K332_Root_IND	AAF	Independent
pook_9K332_Root_BLUFOR	NATO	WEST
pook_9K332_Base	Russian	EAST
pook_9K332_TAK	Takistani	EAST
pook_9K332_INS	ChDKZ INS	EAST
pook_9K332_TKINS	TAK Militia	EAST
pook_9K332_CDF	CDF – Forest	WEST
pook_9K332_CDF_IND	CDF – Desert	Independent
pook_9K332_GUE	NAPA GUE	Independent
pook_9K332_TKGUE	TAK Locals	Independent

BUK FAMILY SA-11 | SA-17

9K37 SA-11 Tracked		
pook_9K37_Root	AAF OPFOR	EAST
pook_9K37_Root_IND	AAF	Independent
pook_9K37_Root_BLUFOR	NATO	WEST
pook_9K37_Base	Russian	EAST
pook_9K37_TAK	Takistani	EAST
pook_9K37_INS	ChDKZ INS	EAST
pook_9K37_TKINS	TAK Militia	EAST
pook_9K37_CDF	CDF – Forest	WEST
pook_9K37_CDF_IND	CDF – Desert	Independent
pook_9K37_GUE	NAPA GUE	Independent
pook_9K37_TKGUE	TAK Locals	Independent

9K37M2 SA-11 Wheeled		
pook_9K37M2_Root	AAF OPFOR	EAST
pook_9K37M2_Root_IND	AAF	Independent
pook_9K37M2_Root_BLUFOR	NATO	WEST
pook_9K37M2_Base	Russian	EAST
pook_9K37M2_TAK	Takistani	EAST
pook_9K37M2_INS	ChDKZ INS	EAST
pook_9K37M2_TKINS	TAK Militia	EAST
pook_9K37M2_CDF	CDF – Forest	WEST
pook_9K37M2_CDF_IND	CDF – Desert	Independent
pook_9K37M2_GUE	NAPA GUE	Independent
pook_9K37M2_TKGUE	TAK Locals	Independent

9K317 SA-17 Tracked		
pook_9K317_Root	AAF OPFOR	EAST
pook_9K317_Root_IND	AAF	Independent
pook_9K317_Root_BLUFOR	NATO	WEST
pook_9K317_Base	Russian	EAST
pook_9K317_TAK	Takistani	EAST
pook_9K317_INS	ChDKZ INS	EAST
pook_9K317_TKINS	TAK Militia	EAST
pook_9K317_CDF	CDF – Forest	WEST
pook_9K317_CDF_IND	CDF – Desert	Independent
pook_9K317_GUE	NAPA GUE	Independent
pook_9K317_TKGUE	TAK Locals	Independent

9K317M2 SA-17 Wheeled		
pook_9K317M2_Root	AAF OPFOR	EAST
pook_9K317M2_Root_IND	AAF	Independent
pook_9K317M2_Root_BLUFOR	NATO	WEST
pook_9K317M2_Base	Russian	EAST
pook_9K317M2_TAK	Takistani	EAST
pook_9K317M2_INS	ChDKZ INS	EAST
pook_9K317M2_TKINS	TAK Militia	EAST
pook_9K317M2_CDF	CDF – Forest	WEST
pook_9K317M2_CDF_IND	CDF – Desert	Independent
pook_9K317M2_GUE	NAPA GUE	Independent
pook_9K317M2_TKGUE	TAK Locals	Independent

9K317M3 SA-17 M3 Tracked		
pook_9K317M3_Root	AAF OPFOR	EAST
pook_9K317M3_Root_IND	AAF	Independent
pook_9K317M3_Root_BLUFOR	NATO	WEST
pook_9K317M3_Base	Russian	EAST
pook_9K317M3_TAK	Takistani	EAST
pook_9K317M3_INS	ChDKZ INS	EAST
pook_9K317M3_TKINS	TAK Militia	EAST
pook_9K317M3_CDF	CDF – Forest	WEST
pook_9K317M3_CDF_IND	CDF – Desert	Independent
pook_9K317M3_GUE	NAPA GUE	Independent
pook_9K317M3_TKGUE	TAK Locals	Independent

9S36 Engagement Radar - Tracked		
pook_9S36_Root	AAF OPFOR	EAST
pook_9S36_Root_IND	AAF	Independent
pook_9S36_Root_BLUFOR	NATO	WEST
pook_9S36_Base	Russian	EAST
pook_9S36_TAK	Takistani	EAST
pook_9S36_INS	ChDKZ INS	EAST
pook_9S36_TKINS	TAK Militia	EAST
pook_9S36_CDF	CDF – Forest	WEST
pook_9S36_CDF_IND	CDF – Desert	Independent
pook_9S36_GUE	NAPA GUE	Independent
pook_9S36_TKGUE	TAK Locals	Independent

96K6 PANTSIR S1 | SA-22

96K6 SA-22 Wheeled		
pook_96K6_root	AAF OPFOR	EAST
pook_96K6_root_IND	AAF	Independent
pook_96K6_root_BLUFOR	NATO	WEST
pook_96K6_Base	Russian	EAST
pook_96K6_TAK	Takistani	EAST
pook_96K6_INS	ChDKZ INS	EAST
pook_96K6_TKINS	TAK Militia	EAST
pook_96K6_CDF	CDF – Forest	WEST
pook_96K6_CDF_IND	CDF – Desert	Independent
pook_96K6_GUE	NAPA GUE	Independent
pook_96K6_TKGUE	TAK Locals	Independent

S-125 | SA-3

SA3 Static Launcher		
pook_SA3_static_root	AAF OPFOR	EAST
pook_SA3_static_root_IND	AAF	Independent
pook_SA3_static_root_BLUFOR	NATO	WEST
pook_SA3_static	ChDKZ (forest green)	EAST
pook_SA3_static_TAK	Tak (desert tak camo)	EAST
pook_SA3_static_TKINS	TAK Militia (desert camo)	EAST
pook_SA3_static_CDF	CDF (forest cdf camo)	WEST
pook_SA3_static_CDF_IND	CDF (desert tan)	Independent
pook_SA3_static_GUE	NAPA GUE (forest camo)	Independent
pook_SA3_static_TKGUE	TAK Locals (desert camo)	Independent

SA3 Mobile Launcher		
pook_SA3_tracked_root	AAF OPFOR	EAST
pook_SA3_tracked_root_IND	AAF	Independent
pook_SA3_tracked_root_BLUFOR	NATO	WEST
pook_SA3_tracked	ChDKZ (forest green)	EAST
pook_SA3_tracked_TAK	Tak (desert tak camo)	EAST
pook_SA3_tracked_TKINS	TAK Militia (desert camo)	EAST
pook_SA3_tracked_CDF	CDF (forest cdf camo)	WEST
pook_SA3_tracked_CDF_IND	CDF (desert tan)	Independent
pook_SA3_tracked_GUE	NAPA GUE (forest camo)	Independent
pook_SA3_tracked_TKGUE	TAK Locals (desert camo)	Independent

S-75 | SA-2

SA3 Static Launcher		
pook_SA2_static_root	AAF OPFOR	EAST
pook_SA2_static_root_IND	AAF	Independent
pook_SA2_static_root_BLUFOR	NATO	WEST
pook_SA2_static	ChDKZ (forest green)	EAST
pook_SA2_static_TAK	Tak (desert tak camo)	EAST
pook_SA2_static_TKINS	TAK Militia (desert camo)	EAST
pook_SA2_static_CDF	CDF (forest cdf camo)	WEST
pook_SA2_static_CDF_IND	CDF (desert tan)	Independent
pook_SA2_static_GUE	NAPA GUE (forest camo)	Independent
pook_SA2_static_TKGUE	TAK Locals (desert camo)	Independent
pook_SA2_static_PLA	VME PLA	Independent

SA2 Mobile Launcher		
pook_SA2_tracked_root	AAF OPFOR	EAST
pook_SA2_tracked_root_IND	AAF	Independent
pook_SA2_tracked_root_BLUFOR	NATO	WEST
pook_SA2_tracked	ChDKZ (forest green)	EAST
pook_SA2_tracked_TAK	Tak (desert tak camo)	EAST
pook_SA2_tracked_TKINS	TAK Militia (desert camo)	EAST
pook_SA2_tracked_CDF	CDF (forest cdf camo)	WEST
pook_SA2_tracked_CDF_IND	CDF (desert tan)	Independent
pook_SA2_tracked_GUE	NAPA GUE (forest camo)	Independent
pook_SA2_tracked_TKGUE	TAK Locals (desert camo)	Independent
pook_SA2_tracked_PLA	VME PLA	Independent

SNR-75 SA2 Radar		
pook_SNR75_radar_base	AAF OPFOR	EAST
pook_SNR75_radar_base_IND	AAF	Independent
pook_SNR75_radar_base_BLUFOR	NATO	WEST
pook_SNR75_radar	ChDKZ (forest green)	EAST
pook_SNR75_radar_TAK	Tak (desert tak camo)	EAST
pook_SNR75_radar_TKINS	TAK Militia (desert camo)	EAST
pook_SNR75_radar_CDF	CDF (forest cdf camo)	WEST
pook_SNR75_radar_CDF_IND	CDF (desert tan)	Independent
pook_SNR75_radar_GUE	NAPA GUE (forest camo)	Independent
pook_SNR75_radar_TKGUE	TAK Locals (desert camo)	Independent
pook_SNR75_radar_PLA	VME PLA	Independent

NASAMS

NASAMS Mobile		
pook_NASAMS_BASE	NATO	WEST
pook_NASAMS_BASE_IND	AAF	Independent
pook_NASAMS	USMC – Forest	WEST
pook_NASAMS_US	US – Desert	WEST
pook_NASAMS_CDF	CDF – Green	WEST
pook_NASAMS_CDF_IND	CDF – Desert	Independent

NASAMS Single Battery		
pook_NASAMS_battery_BASE	NATO	WEST
pook_NASAMS_battery_BASE_IND	AAF	Independent
pook_NASAMS_battery	USMC – Forest	WEST
pook_NASAMS_battery_US	US – Desert	WEST
pook_NASAMS_battery_CDF	CDF – Green	WEST
pook_NASAMS_battery_CDF_IND	CDF – Desert	Independent

NASAMS AN/MPQ-64 Engagement Radar		
pook_ANMPQ64_base	NATO	WEST
pook_ANMPQ64_base_IND	AAF	Independent
pook_ANMPQ64	USMC – Forest	WEST
pook_ANMPQ64_US	US – Desert	WEST
pook_ANMPQ64_CDF	CDF – Green	WEST
pook_ANMPQ64_CDF_IND	CDF – Desert	Independent

C-RAM

C-RAM Wheeled		
pook_CRAM_BASE	NATO	WEST
pook_CRAM_BASE_IND	AAF	Independent
pook_CRAM	USMC – Forest	WEST
pook_CRAM_US	US – Desert	WEST
pook_CRAM_CDF	CDF – Green	WEST
pook_CRAM_CDF_IND	CDF – Desert	Independent

MIM-104 PATRIOT

MIM-104 PAC-3 Launcher (player-usable. The “standalone” launcher on the sites are different vehicles)		
pook_MIM104_PAC3_Base	NATO	WEST
pook_MIM104_PAC3_Base_IND	AAF	Independent
pook_MIM104_PAC3	USMC – Forest	WEST
pook_MIM104_PAC3_US	US – Desert	WEST
pook_MIM104_PAC3_CDF	CDF – Green	WEST
pook_MIM104_PAC3_CDF_IND	CDF – Desert	Independent

MIM-104 PAC-2 Launcher (player-usable. The “standalone” launcher on the sites are different vehicles)		
pook_MIM104_PAC2_Base	NATO	WEST
pook_MIM104_PAC2_Base_IND	AAF	Independent
pook_MIM104_PAC2	USMC – Forest	WEST
pook_MIM104_PAC2_US	US – Desert	WEST
pook_MIM104_PAC2_CDF	CDF – Green	WEST
pook_MIM104_PAC2_CDF_IND	CDF – Desert	Independent

AN/MPQ-53 Engagement Radar		
pook_ANMPQ53_Base	NATO	WEST
pook_ANMPQ53_Base_IND	AAF	Independent
pook_ANMPQ53	USMC – Forest	WEST
pook_ANMPQ53_US	US – Desert	WEST
pook_ANMPQ53_CDF	CDF – Green	WEST
pook_ANMPQ53_CDF_IND	CDF – Desert	Independent

OE-349 Acquisition / Early-warning Radar These empty vehicles are unmanned and therefore found under the "EMPTY" category. They are not faction-specific and can be interchanged for color/terrain options.		
pook_OE349	USMC – Forest	WEST
pook_OE349_US	US – Desert	WEST
pook_OE349_CDF	CDF – Green	WEST
pook_OE349_CDF_IND	CDF – Desert	Independent

MEADS

MEADS Mobile		
pook_MEADS_base	NATO	WEST
pook_MEADS_base_IND	AAF	Independent
pook_MEADS_USMC	USMC	WEST
pook_MEADS_US	US	WEST
pook_MEADS_GER	Germany	WEST
pook_MEADS_ACR	ACR	WEST
pook_MEADS_CDF	CDF	WEST
pook_MEADS_CDF_IND	CDF (Independent)	Independent
pook_MEADS_GUE	NAPA GUE	Independent
pook_MEADS_INS	ChDKZ INS	EAST

MIM-23 HAWK

MIM-23 Launcher		
pook_MIM23_root	NATO	WEST
pook_MIM23_root_IND	AAF	Independent
pook_MIM23_root_OPFOR	AAF OPFOR	EAST
pook_MIM23_USMC	USMC – Forest	WEST
pook_MIM23_US	US – Desert	WEST
pook_MIM23_CDF	CDF – Forest Camo	WEST
pook_MIM23_CDF_IND	CDF – Desert Tan	Independent
pook_MIM23_GUE	NAPA – GUE – Jungle Camo	Independent
pook_MIM23_TKGUE	TAK-Guerilla - Desert Brown	Independent
pook_MIM23_TAK	TAK - Desert TAK Camo	EAST
pook_MIM23_TKINS	TAK-Militia - Desert Camo	EAST
pook_MIM23_INS	ChdKz Insurgents – Jungle Green	EAST

MIM-23 Battery Command Post (BCP)		
pook_BCP_root	NATO	WEST
pook_BCP_root_IND	AAF	Independent
pook_BCP_root_OPFOR	AAF OPFOR	EAST
pook_BCP_USMC	USMC – Forest	WEST
pook_BCP_US	US – Desert	WEST
pook_BCP_CDF	CDF – Forest Camo	WEST
pook_BCP_CDF_IND	CDF – Desert Tan	Independent
pook_BCP_GUE	NAPA – GUE – Jungle Camo	Independent
pook_BCP_TKGUE	TAK-Guerilla - Desert Brown	Independent
pook_BCP_TAK	TAK - Desert TAK Camo	EAST
pook_BCP_TKINS	TAK-Militia - Desert Camo	EAST
pook_BCP_INS	ChdKz Insurgents – Jungle Green	EAST

AN/MPQ-61 HAWK Engagement\Tracking Radar		
pook_ANMPQ61_root	NATO	WEST
pook_ANMPQ61_root_IND	AAF	Independent
pook_ANMPQ61_root_OPFOR	AAF OPFOR	EAST
pook_ANMPQ61_USMC	USMC – Forest	WEST
pook_ANMPQ61_US	US – Desert	WEST
pook_ANMPQ61_CDF	CDF – Forest Camo	WEST
pook_ANMPQ61_CDF_IND	CDF – Desert Tan	Independent
pook_ANMPQ61_GUE	NAPA – GUE – Jungle Camo	Independent
pook_ANMPQ61_TKGUE	TAK-Guerilla - Desert Brown	Independent
pook_ANMPQ61_TAK	TAK - Desert TAK Camo	EAST
pook_ANMPQ61_TKINS	TAK-Militia - Desert Camo	EAST
pook_ANMPQ61_INS	ChdKz Insurgents – Jungle Green	EAST

AN/MPQ-62 HAWK Continuous-Wave Acquisition Radar (CWAR)		
pook_ANMPQ62_root	NATO	WEST
pook_ANMPQ62_root_IND	AAF	Independent
pook_ANMPQ62_root_OPFOR	AAF OPFOR	EAST
pook_ANMPQ62_USMC	USMC – Forest	WEST
pook_ANMPQ62_US	US – Desert	WEST
pook_ANMPQ62_CDF	CDF – Forest Camo	WEST
pook_ANMPQ62_CDF_IND	CDF – Desert Tan	Independent
pook_ANMPQ62_GUE	NAPA – GUE – Jungle Camo	Independent
pook_ANMPQ62_TKGUE	TAK-Guerilla - Desert Brown	Independent
pook_ANMPQ62_TAK	TAK - Desert TAK Camo	EAST
pook_ANMPQ62_TKINS	TAK-Militia - Desert Camo	EAST
pook_ANMPQ62_INS	ChdKz Insurgents – Jungle Green	EAST

AN/MPQ-50 HAWK Pulse Acquisition Radar (PAR)		
pook_ANMPQ50_root	NATO	WEST
pook_ANMPQ50_root_IND	AAF	Independent
pook_ANMPQ50_root_OPFOR	AAF OPFOR	EAST
pook_ANMPQ50_USMC	USMC – Forest	WEST
pook_ANMPQ50_US	US – Desert	WEST
pook_ANMPQ50_CDF	CDF – Forest Camo	WEST
pook_ANMPQ50_CDF_IND	CDF – Desert Tan	Independent
pook_ANMPQ50_GUE	NAPA – GUE – Jungle Camo	Independent
pook_ANMPQ50_TKGUE	TAK-Guerilla - Desert Brown	Independent
pook_ANMPQ50_TAK	TAK - Desert TAK Camo	EAST
pook_ANMPQ50_TKINS	TAK-Militia - Desert Camo	EAST
pook_ANMPQ50_INS	ChdKz Insurgents – Jungle Green	EAST

AAA BATTERY AND COMPONENT CLASSNAMES

Individual vehicle class names are found under “Air Defense – AAA”.

NOTE: PLA units require VME PLA. CUP units require CUP.

STANDARD AAA RADARS AND BATTERIES

These “standard” units are not platform-dedicated like most others, and may be found in use with different systems created by the site spawner scripts.

P12 Acquisition / EWR Radar (“Spoon Rest”)		
pook_P12_root	AAF OPFOR	EAST
pook_P12_root_IND	AAF	Independent
pook_P12_root_BLUFOR	NATO	WEST
pook_P12_RU	Russian	EAST
pook_P12_TAK	Takistan	EAST
pook_P12_INS	TAK Militia	EAST
pook_P12_TKINS	ChDKZ INS	EAST
pook_P12_CDF	CDF	WEST
pook_P12_CDF_IND	CDF	Independent
pook_P12_GUE	NAPA GUE	Independent
pook_P12_TKGUE	TAK Locals	Independent
pook_P12_PLA	VME PLA	Independent

P18 Acquisition / EWR Radar (“Spoon Rest-D”)		
pook_P18_root	AAF OPFOR	EAST
pook_P18_root_IND	AAF	Independent
pook_P18_root_BLUFOR	NATO	WEST
pook_P18_RU	Russian	EAST
pook_P18_TAK	Takistan	EAST
pook_P18_INS	TAK Militia	EAST
pook_P18_TKINS	ChDKZ INS	EAST
pook_P18_CDF	CDF	WEST
pook_P18_CDF_IND	CDF	Independent
pook_P18_GUE	NAPA GUE	Independent
pook_P18_TKGUE	TAK Locals	Independent
pook_P18_PLA	VME PLA	Independent

URAL “Utility” Truck		
pook_URAL_UTILITY	AAF OPFOR	EAST
pook_URAL_UTILITY_IND	AAF	Independent
pook_URAL_UTILITY_BLUFOR	NATO	WEST
pook_URAL_UTILITY_RU	Russian	EAST
pook_URAL_UTILITY_TAK	Takistan	EAST
pook_URAL_UTILITY_TKINS	TAK Militia	EAST
pook_URAL_UTILITY_INS	ChDKZ INS	EAST
pook_URAL_UTILITY_CDF	CDF	WEST
pook_URAL_UTILITY_CDF_IND	CDF	Independent
pook_URAL_UTILITY_GUE	NAPA GUE	Independent
pook_URAL_UTILITY_TKGUE	TAK Locals	Independent
pook_URAL_UTILITY_UNO	UNO	Independent
pook_URAL_UTILITY_PLA	VME PLA	Independent

SON-9 AAA Engagement Radar (AAA)		
pook_SON9_base	AAF OPFOR	EAST
pook_SON9_base_IND	AAF	Independent
pook_SON9_base_BLUFOR	NATO	WEST
pook_SON9_RU	Russian	EAST
pook_SON9_TAK	Takistan	EAST
pook_SON9_TKINS	TAK Militia	EAST
pook_SON9_INS	ChDKZ INS	EAST
pook_SON9_CDF	CDF	WEST
pook_SON9_CDF_IND	CDF	Independent
pook_SON9_GUE	NAPA GUE	Independent
pook_SON9_TKGUE	TAK Locals	Independent
pook_SON9_PLA	VME PLA	Independent

PUAZO 6/60 AAA Rangefinder (AAA)		
pook_PUAZO_base	AAF OPFOR	EAST
pook_PUAZO_base_IND	AAF	Independent
pook_PUAZO_base_BLUFOR	NATO	WEST
pook_PUAZO_RU	Russian	EAST
pook_PUAZO_TAK	Takistan	EAST
pook_PUAZO_TKINS	TAK Militia	EAST
pook_PUAZO_INS	ChDKZ INS	EAST
pook_PUAZO_CDF	CDF	WEST
pook_PUAZO_CDF_IND	CDF	Independent
pook_PUAZO_GUE	NAPA GUE	Independent
pook_PUAZO_TKGUE	TAK Locals	Independent
pook_PUAZO_PLA	VME PLA	Independent

PRV-11 Height-Finding Radar		
pook_PRV11_base	AAF OPFOR	EAST
pook_PRV11_base_IND	AAF	Independent
pook_PRV11_base_BLUFOR	NATO	WEST
pook_PRV11_RU	Russian	EAST
pook_PRV11_TAK	Takistan	EAST
pook_PRV11_TKINS	TAK Militia	EAST
pook_PRV11_INS	ChDKZ INS	EAST
pook_PRV11_CDF	CDF	WEST
pook_PRV11_CDF_IND	CDF	Independent
pook_PRV11_GUE	NAPA GUE	Independent
pook_PRV11_TKGUE	TAK Locals	Independent
pook_PRV11_PLA	VME PLA	Independent

ZPU-4 14.5mm AAA battery (Arma2 v3.x only)		
pook_ZPU4_RU	Russian	EAST
pook_ZPU4_TAK	Takistan	EAST
pook_ZPU4_INS	TAK Militia	EAST
pook_ZPU4_TK_INS	ChDKZ INS	EAST
pook_ZPU4_CDF	CDF	WEST
pook_ZPU4_GUE	NAPA GUE	Independent
pook_ZPU4_TK_GUE	TAK Locals	Independent

ZU-23 23mm dual-barrel AAA battery		
pook_ZU23_base	AAF OPFOR	EAST
pook_ZU23_base_IND	AAF	Independent
pook_ZU23_base_BLUFOR	NATO	WEST
pook_ZU23_RU	Russian	EAST
pook_ZU23_TAK	Takistan	EAST
pook_ZU23_TKINS	TAK Militia	EAST
pook_ZU23_INS	ChDKZ INS	EAST
pook_ZU23_CDF	CDF	WEST
pook_ZU23_CDF_IND	CDF	Independent
pook_ZU23_GUE	NAPA GUE	Independent
pook_ZU23_TKGUE	TAK Locals	Independent
pook_ZU23_PLA	VME PLA	Independent

ZU-23”M” 23mm dual-barrel AAA battery with MANPAD launcher		
pook_ZU23M_base	AAF OPFOR	EAST
pook_ZU23M_base_IND	AAF	Independent
pook_ZU23M_base_BLUFOR	NATO	WEST
pook_ZU23M_RU	Russian	EAST
pook_ZU23M_TAK	Takistan	EAST
pook_ZU23M_TKINS	TAK Militia	EAST
pook_ZU23M_INS	ChDKZ INS	EAST
pook_ZU23M_CDF	CDF	WEST
pook_ZU23M_CDF_IND	CDF	Independent
pook_ZU23M_GUE	NAPA GUE	Independent
pook_ZU23M_TKGUE	TAK Locals	Independent

ZSU-23 23MM SPAAG FAMILY

PU-12 Radar on BTR-60 chassis with antenna mast 9S482 / 9S482M		
pook_PU12_base	AAF OPFOR	EAST
pook_PU12_base_IND	AAF	Independent
pook_PU12_base_BLUFOR	NATO	WEST
pook_PU12_RU	Russian	EAST
pook_PU12_TAK	Takistan	EAST
pook_PU12_TKINS	TAK Militia	EAST
pook_PU12_INS	ChDKZ INS	EAST
pook_PU12_CDF	CDF	WEST
pook_PU12_CDF_IND	CDF	Independent
pook_PU12_GUE	NAPA GUE	Independent
pook_PU12_TKGUE	TAK Locals	Independent

ZSU-23-4 SPAAG AAA Battery (revised classnames for Arma3)		
pook_ZSU_base	AAF OPFOR	EAST
pook_ZSU_base_IND	AAF	Independent
pook_ZSU_base_BLUFOR	NATO	WEST
pook_ZSU_RU	Russian	EAST
pook_ZSU_TAK	Takistan	EAST
pook_ZSU_TK_INS	TAK Militia	EAST
pook_ZSU_INS	ChDKZ INS	EAST
pook_ZSU_CDF	CDF	WEST
pook_ZSU_CDF_IND	CDF	Independent
pook_ZSU_GUE	NAPA GUE	Independent
pook_ZSU_TK_GUE	TAK Locals	Independent

ZSU-23-4M4 AAA Battery with MANPAD launcher		
pook_ZSUM4_base	AAF OPFOR	EAST
pook_ZSUM4_base_IND	AAF	Independent
pook_ZSUM4_base_BLUFOR	NATO	WEST
pook_ZSUM4_RU	Russian	EAST
pook_ZSUM4_TAK	Takistan	EAST
pook_ZSUM4_TK_INS	TAK Militia	EAST
pook_ZSUM4_INS	ChDKZ INS	EAST
pook_ZSUM4_CDF	CDF	WEST
pook_ZSUM4_CDF_IND	CDF	Independent
pook_ZSUM4_GUE	NAPA GUE	Independent
pook_ZSUM4_TK_GUE	TAK Locals	Independent

ZSU-23-4 AAA SPAWN UNITS (ONLY FOR AAA SITE or SCRIPTING USE)		
pook_ZSU_AA_base	AAF OPFOR	EAST
pook_ZSU_AA_base_IND	AAF	Independent
pook_ZSU_AA_base_BLUFOR	NATO	WEST
pook_ZSU_AA_RU	Russian	EAST
pook_ZSU_AA_TAK	Takistan	EAST
pook_ZSU_AA_TK_INS	TAK Militia	EAST
pook_ZSU_AA_INS	ChDKZ INS	EAST
pook_ZSU_AA_CDF	CDF	WEST
pook_ZSU_AA_CDF_IND	CDF	Independent
pook_ZSU_AA_GUE	NAPA GUE	Independent
pook_ZSU_AA_TK_GUE	TAK Locals	Independent

S-60 57MM AAA FAMILY

SON-50 AAA Engagement Radar (S60)		
pook_SON50_base	AAF OPFOR	EAST
pook_SON50_base_IND	AAF	Independent
pook_SON50_base_BLUFOR	NATO	WEST
pook_SON50_RU	Russian	EAST
pook_SON50_TAK	Takistan	EAST
pook_SON50_TKINS	TAK Militia	EAST
pook_SON50_INS	ChDKZ INS	EAST
pook_SON50_CDF	CDF	WEST
pook_SON50_CDF_IND	CDF	Independent
pook_SON50_GUE	NAPA GUE	Independent
pook_SON50_TKGUE	TAK Locals	Independent
pook_SON50_PLA	VME PLA	Independent

S60 57mm AAA Battery		
pook_S60_base	AAF OPFOR	EAST
pook_S60_base_IND	AAF	Independent
pook_S60_base_BLUFOR	NATO	WEST
pook_S60_RU	Russian	EAST
pook_s60_TK	Takistan	EAST
pook_s60_TK_INS	TAK Militia	EAST
pook_S60_INS	ChDKZ INS	EAST
pook_S60_CDF	CDF	WEST
pook_S60_CDF_IND	CDF	Independent
pook_S60_GUE	NAPA GUE	Independent
pook_s60_TK_GUE	TAK Locals	Independent
pook_S60_PLA	VME PLA	Independent

KS-12 85MM AAA

KS-12 static AAA Battery		
pook_KS12_base	AAF OPFOR	EAST
pook_KS12_base_IND	AAF	Independent
pook_KS12_base_BLUFOR	NATO	WEST
pook_KS12_RU	Russian	EAST
pook_KS12_TAK	Takistan	EAST
pook_KS12_TKINS	TAK Militia	EAST
pook_KS12_INS	ChDKZ INS	EAST
pook_KS12_CDF	CDF	WEST
pook_KS12_CDF_IND	CDF	Independent
pook_KS12_GUE	NAPA GUE	Independent
pook_KS12_TKGUE	TAK Locals	Independent
pook_KS12_PLA	VME PLA	Independent

KS-19 100MM AAA

KS-12 static AAA Battery		
pook_KS19_base	AAF OPFOR	EAST
pook_KS19_base_IND	AAF	Independent
pook_KS19_base_BLUFOR	NATO	WEST
pook_KS19_RU	Russian	EAST
pook_KS19_TAK	Takistan	EAST
pook_KS19_TKINS	TAK Militia	EAST
pook_KS19_INS	ChDKZ INS	EAST
pook_KS19_CDF	CDF	WEST
pook_KS19_CDF_IND	CDF	Independent
pook_KS19_GUE	NAPA GUE	Independent
pook_KS19_TKGUE	TAK Locals	Independent
pook_KS19_PLA	VME PLA	Independent

APPENDIX: ARM PRE-REQUISITES: FOR ADDON AND MISSION MAKERS

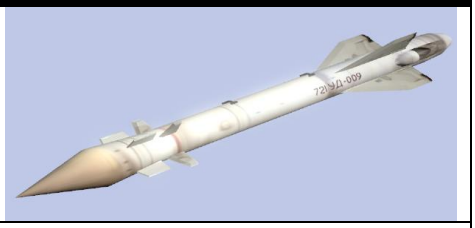
This section has been rearranged to be easier to read and implement. Feedback is appreciated!

NOTE: The USAF mod's AGM-88 HARM missiles will be directly supported by this addon in their next release!

For the Arma2 section, the instructions apply to aircraft not found in the Rangemaster addon. Those aircraft found in the Rangemaster addon already have all the correct variable assignments to utilize AR missiles.

CURRENT MISSILE LIST

I intend to add more AR missiles to the list as they become available, or when I have the time to create them. Addon makers who wish to have their weapons added to the reference list should contact me so I can add them!

Missile	cfgWeapons	cfgMagazines	3D View
Kh-25MP	**pook_SAM_Kh25MP_Launcher**	**pook_SAM_Kh25MPx1** **pook_SAM_Kh25MPx2** **pook_SAM_Kh25MPx4**	
	Medium-range standard ARM. Modernized version simulated. (NATO: AS-12)		
ALARM	**pook_SAM_ALARM_Launcher**	**pook_SAM_ALARMx1** **pook_SAM_ALARMx2** **pook_SAM_ALARMx4**	
	The Air-Launched Anti-Radiation Missile (ALARM) was the BAF "standard" AR Missile up to present day. Both direct-fire and "Loiter" modes are now available.		

ADDON MAKERS: CREATING AND EQUIPPING ARM MISSILE WEAPONS

It is suggested that addon makers should copy the scripts and implement them directly within their mod in order to avoid dependency issues for their SEAD aircraft. It will be up to the addon makers to track updates to these scripts. This is an option for addon makers. The scripts could be customized further to better suit the addon makers' purposes.

STEP 1: INIT SCRIPT

This code is must be added to the vehicle's INIT script. It sets the "**ELS_Active**" startup value to "0":

```
_ELS = _veh getVariable "ELS_Active";
if (isNil "_ELS") then {
        _veh setVariable ['ELS_Active', 0, true];
};
```

The INIT script will check if the setting exists, and if it does not, set the default setting of "0". If the setting already exists, the script does nothing. The setting is public (for multi-player environments). This should yield a JIP compatible experience; however further

testing may be warranted. Feedback so far has been positive. This can be added to an existing plane's INIT script, or a new INIT script may be created. The code must run on vehicle "INIT".

STEP 2: USER ACTIONS

Addon makers can utilize these actions within their **cfgVehicles** sections. These are the **class UserActions** settings required for the ARM scripts to function correctly. Note that these actions depend on the aforementioned "INIT" variable to be created.

Keep in mind that the secondary "detect and fire" action was added to accommodate the in-game behavior of targets outside of your view distance settings being unable to remain locked. While this was done for optimization purposes, it breaks the abilities of the "primary" detect – then – fire actions to work correctly.

```
class UserActions {
	class ARMRadarDetect {
		displayName = "SEAD - Activate ELS";
		position = "zamerny";
		showWindow = 0;
		radius = 4;
		priority = 2;
		onlyForPlayer = 0;
		shortcut = "AutoHover";
		condition = "(alive this) && (player == (driver this)) && (this GetVariable 'ELS_Active') == 0";
		statement = "[this] execVM '\pook_SAM\scripts\ARMRadarDetect.sqf';";
	};
	class ARMRadarEngage {
		displayName = "SEAD - Engage ARM Indirect Fire Mode";
		position = "zamerny";
		showWindow = 0;
		radius = 4;
		priority = 2;
		onlyForPlayer = 0;
		shortcut = "AutoHoverCancel";
		condition = "(alive this) && (player == (driver this)) && (this GetVariable 'ELS_Active') == 1";
		statement = "[this] execVM '\pook_SAM\scripts\ARMRadarEngage.sqf';";
	};
	class ARMRadarEngageSecondary {
		displayName = "SEAD - Engage ARM Detect and Auto-Fire";
		position = "zamerny";
		showWindow = 0;
		radius = 4;
		priority = 1;
		onlyForPlayer = 0;
		shortcut = "";
		condition = "(alive this) && (player == (driver this)) && (this GetVariable 'ELS_Active') == 1";
		statement = "[this] execVM '\pook_SAM\scripts\ARMRadarDetectandFire.sqf';";
	};
	class ARMRadarCancel {
		displayName = "SEAD - Cancel ELS";
		position = "zamerny";
		showWindow = 0;
		radius = 4;
		priority = 2;
		shortcut = "LockTarget";
		onlyForPlayer = 0;
		condition = "(alive this) && (player == (driver this)) && (this GetVariable 'ELS_Active') == 1";
		statement = "[this] execVM '\pook_SAM\scripts\ARMRadarCancel.sqf';";
	};
};
```

MISSION MAKERS: EQUIPPING VEHICLES WITH ARM MISSILES

Anyone can equip the ARM missiles on any aircraft they desire by arming an aircraft via these two steps. It should be noted that in the examples listed below, the vehicle is named “veh1”. You can of course name the vehicle anything you wish. The use of “this” for the vehicle name in the script actions should also work.

STEP 1: ADD USER ACTIONS TO THE AIRCRAFT:

ARM functionality is governed by three scripts that create actions for correctly equipped aircraft. Aircraft can be configured to employ this functionality via several actions. Mission makers can add these three actions in the aircraft’s INIT line in the editor. This example is configured for the “veh1” aircraft:

```
veh1 addAction ["ARM - Activate ELS", "\pook_SAM\scripts\ARMRadarDetect.sqf","",5,false,true,"AutoHover","veh1 GetVariable ['ELS_Active', 0] == 0"];
veh1 addAction ["ARM - Indirect Fire Mode", "\pook_SAM\scripts\ARMRadarEngage.sqf","",5,false,true,"AutoHoverCancel","veh1 GetVariable 'ELS_Active' == 1"];
veh1 addAction ["ARM - Cancel ELS", "\pook_SAM\scripts\ARMRadarCancel.sqf","",5,false,true,"LockTarget","veh1 GetVariable 'ELS_Active' == 1"];
veh1 addAction ["ARM – Secondary Fire Mode", "\pook_SAM\scripts\ARMRadarDetectandFire.sqf","",5,false,true,"veh1 GetVariable 'ELS_Active' == 1"];
```

STEP 2: LOAD THE AIRCRAFT WITH ANTI-RADIATION MISSILES:

The aircraft must be equipped with one of the following supported ARM weapons (and appropriate magazines).

Please consult the table above in the “***Current Missile List***” in the previous section of this appendix for the active weapon / magazine list. There you’ll find the names for the current weapon / magazine names found in this addon (currently Kh-25MP and ALARM). This list will be expanded in the future!

This screenshot shows what an example loadout using the 2x magazine would look like. Since the vehicle name in this example is “veh1”, the use of “this” in the Init field could be replaced with “veh1” for this instance:

Mission makers could also include these commands in a “respawn” INIT script.

That’s all there is to it! When these two steps have been performed on the plane in question, no further requirements are necessary. The actions trigger the ARM launch scripts, where all the magic happens.

LEGACY ARMA2 INSTRUCTIONS

The legacy Arma 2 instructions have been retained for posterity. This version is no longer directly supported, in favor of Arma3.

Weapon	Magazines
EB_AGM45_Launcher	"EB_AGM45x1","EB_AGM45x2","EB_AGM45x3","EB_AGM45x4","EB_AGM45x5","EB_AGM45x6","EB_AGM45x7","EB_AGM45x8","EB_AGM45x9","EB_AGM45x10","EB_AGM45x11","EB_AGM45x12"
EB_AGM88_Launcher	"EB_AGM88x1","EB_AGM88x2","EB_AGM88x3","EB_AGM88x4","EB_AGM88x5","EB_AGM88x6","EB_AGM88x7","EB_AGM88x8","EB_AGM88x9","EB_AGM88x10","EB_AGM88x11","EB_AGM88x12"
EB_AGM122_Launcher	"EB_AGM122x1","EB_AGM122x2","EB_AGM122x3","EB_AGM122x4","EB_AGM122x5","EB_AGM122x6","EB_AGM122x7","EB_AGM122x8","EB_AGM122x9","EB_AGM122x10","EB_AGM122x11","EB_AGM122x12"
EB_KH25MP_Launcher	"EB_KH25MPx1","EB_KH25MPx2","EB_KH25MPx3","EB_KH25MPx4","EB_KH25MPx5","EB_KH25MPx6","EB_KH25MPx7","EB_KH25MPx8","EB_KH25MPx9","EB_KH25MPx10","EB_KH25MPx11","EB_KH25MPx12"
EB_KH15P_Launcher	"EB_KH15Px1","EB_KH15Px2","EB_KH15Px3","EB_KH15Px4","EB_KH15Px5","EB_KH15Px6","EB_KH15Px7","EB_KH15Px8","EB_KH15Px9","EB_KH15Px10","EB_KH15Px11","EB_KH15Px12"
EB_KH31_Launcher	"EB_KH31x1","EB_KH31x2","EB_KH31x3","EB_KH31x4","EB_KH31x5","EB_KH31x6","EB_KH31x7","EB_KH31x8","EB_KH31x9","EB_KH31x10","EB_KH31x11","EB_KH31x12"
pook_ALARM_Launcher	"pook_ALARMx1","pook_ALARMx2","pook_ALARMx3","pook_ALARMx4","pook_ALARMx5","pook_ALARMx6","pook_ALARMx7","pook_ALARMx8","pook_ALARMx9","pook_ALARMx10","pook_ALARMx11","pook_ALARMx12"

These are from the RangeMaster pack, or the resident ARM weapons in this pack:

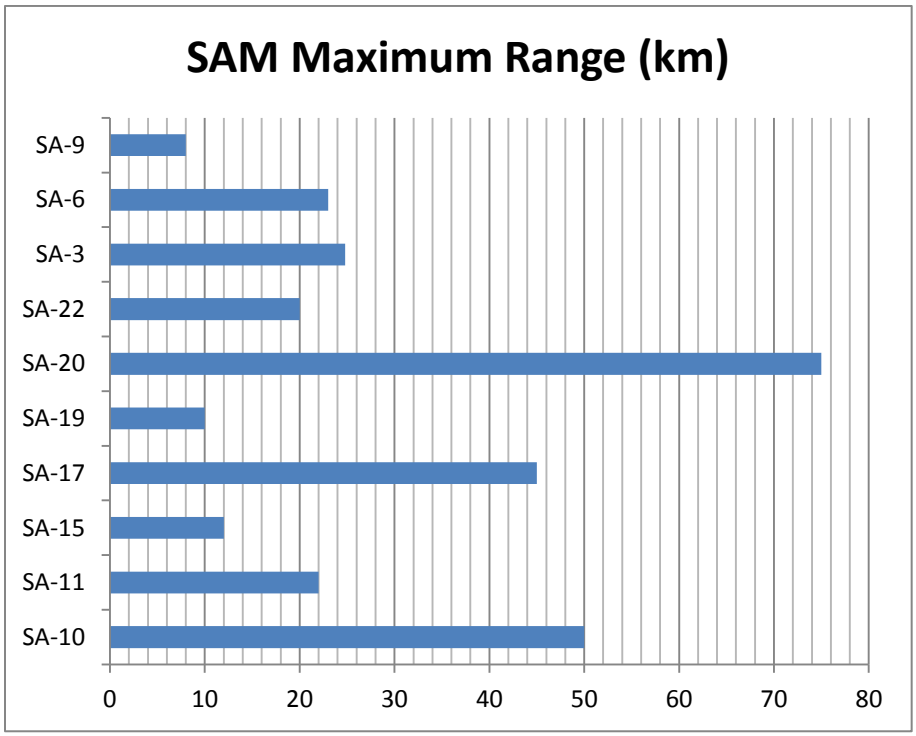
Missile	Weapon in-game	Description
AGM-45 Shrike	**EB_AGM45_Launcher**	Used by US forces in the 1960's, and subsequently by other countries since.
AGM-88 HARM	**EB_AGM88_Launcher**	The US-built HARM has become the "standard" AR missile used by NATO forces and many other countries.
AGM-122 Sidearm	**EB_AGM122_Launcher**	This helicopter-capable ARM is based on the AIM-9 Sidewinder.
Kh-25MP	**EB_KH25MP_Launcher**	Medium-range standard ARM. Modernized version simulated. (NATO: AS-12)
Kh-15	**EB_KH15P_Launcher**	The Kh-15 is a high speed, short-range ARM. (NATO: AS-16)
Kh-31	**EB_KH31_Launcher**	The Kh-31 is a long-range high-speed ramjet-based ARM. (NATO: AS-17)
ALARM	**pook_ALARM_Launcher**	The Air-Launched Anti-Radiation Missile (ALARM) has been the BAF "standard" AR Missile up to present day. Both direct-fire and "Loiter" modes are now available (v2.6)

The following table lists all the magazines that are available for the supported anti-radiation missile weapons in both this POOK_SAM pack and the RangeMaster pack:

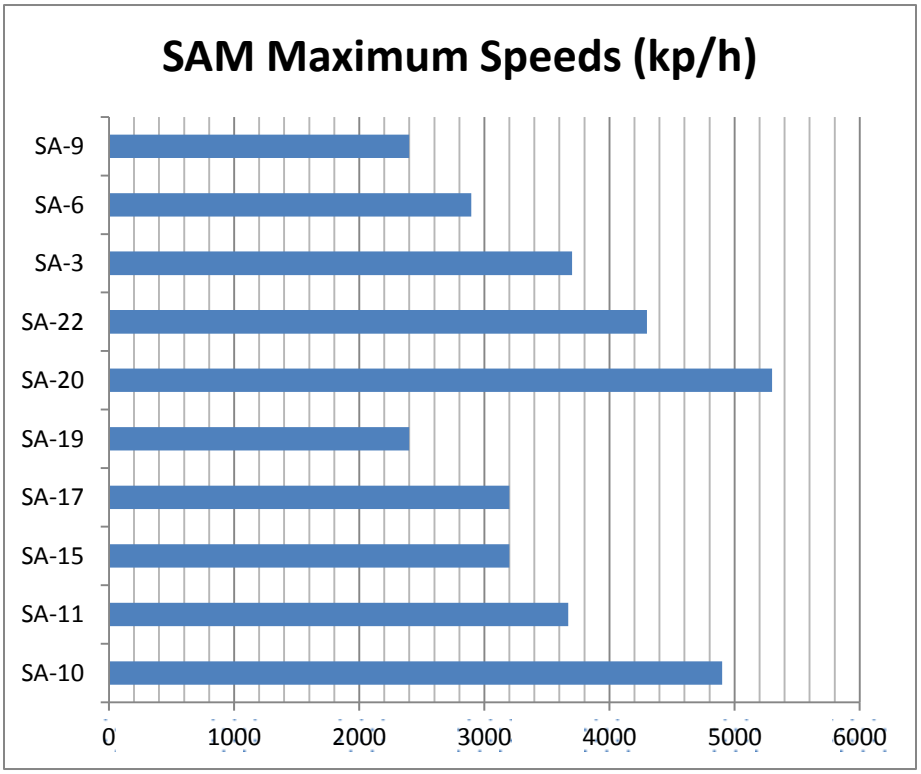
Weapon	Magazines
EB_AGM45_Launcher	"EB_AGM45x1","EB_AGM45x2","EB_AGM45x3","EB_AGM45x4","EB_AGM45x5","EB_AGM45x6","EB_AGM45x7","EB_AGM45x8","EB_AGM45x9","EB_AGM45x10","EB_AGM45x11","EB_AGM45x12"
EB_AGM88_Launcher	"EB_AGM88x1","EB_AGM88x2","EB_AGM88x3","EB_AGM88x4","EB_AGM88x5","EB_AGM88x6","EB_AGM88x7","EB_AGM88x8","EB_AGM88x9","EB_AGM88x10","EB_AGM88x11","EB_AGM88x12"
EB_AGM122_Launcher	"EB_AGM122x1","EB_AGM122x2","EB_AGM122x3","EB_AGM122x4","EB_AGM122x5","EB_AGM122x6","EB_AGM122x7","EB_AGM122x8","EB_AGM122x9","EB_AGM122x10","EB_AGM122x11","EB_AGM122x12"
EB_KH25MP_Launcher	"EB_KH25MPx1","EB_KH25MPx2","EB_KH25MPx3","EB_KH25MPx4","EB_KH25MPx5","EB_KH25MPx6","EB_KH25MPx7","EB_KH25MPx8","EB_KH25MPx9","EB_KH25MPx10","EB_KH25MPx11","EB_KH25MPx12"
EB_KH15P_Launcher	"EB_KH15Px1","EB_KH15Px2","EB_KH15Px3","EB_KH15Px4","EB_KH15Px5","EB_KH15Px6","EB_KH15Px7","EB_KH15Px8","EB_KH15Px9","EB_KH15Px10","EB_KH15Px11","EB_KH15Px12"
EB_KH31_Launcher	"EB_KH31x1","EB_KH31x2","EB_KH31x3","EB_KH31x4","EB_KH31x5","EB_KH31x6","EB_KH31x7","EB_KH31x8","EB_KH31x9","EB_KH31x10","EB_KH31x11","EB_KH31x12"
pook_ALARM_Launcher	"pook_ALARMx1","pook_ALARMx2","pook_ALARMx3","pook_ALARMx4","pook_ALARMx5","pook_ALARMx6","pook_ALARMx7","pook_ALARMx8","pook_ALARMx9","pook_ALARMx10","pook_ALARMx11","pook_ALARMx12"

APPENDIX: SAM RELATIVE PERFORMANCE

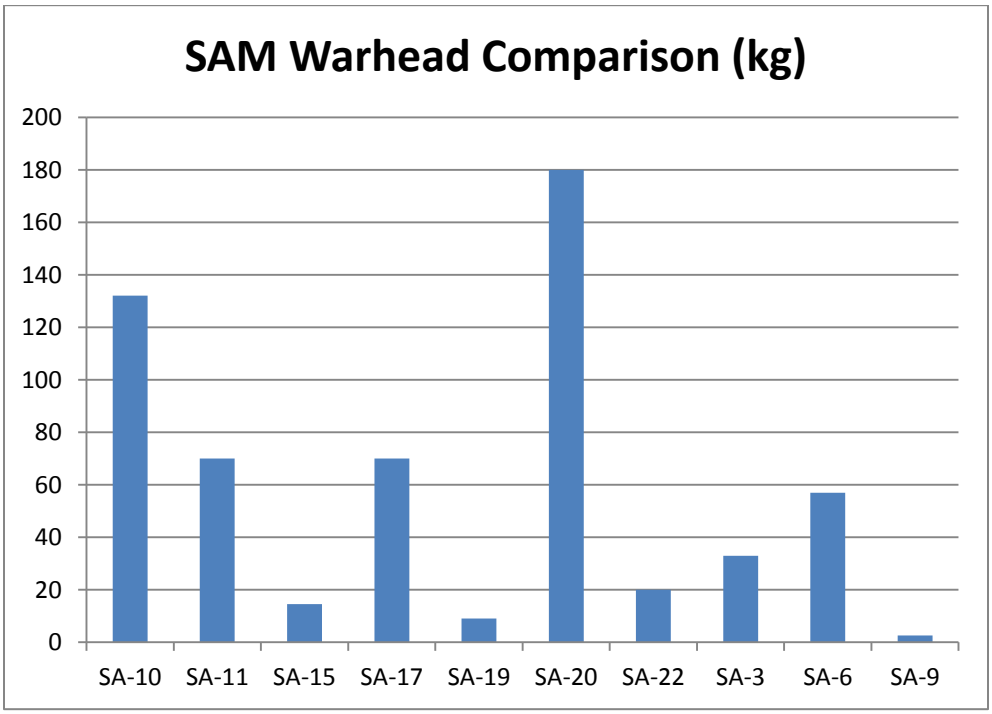
This section describes the relative performance characteristics of the SAM systems in this addon. Values are based on real world data resources. Some real-world values have been adjusted to enhance game play.



Maximum speeds describe the absolute maximum terminal velocity that the missiles can achieve.



Note warhead size is only a relative scale, as some SAM warhead designs are more effective, depending on application, delivery platform, and intended target. Remember that a legacy SA-3 system downed a USAF F-117 “Stealth Fighter” in 1999!



APPENDIX: ECM / JAMMING SUPPORT

New in v4.2: Added support for Electronic Counter-Measures (ECM) and Jamming / Spoofing scripts. This is achieved by adding new values to the missiles and radar vehicles that external scripts can read. The values currently consist of the following flags:

- Home-On-Jam: Does the missile possess "Home-On-Jam" capability?
- Frequency Hopping: Does the missile possess frequency-hopping capability?
- Radar Band: Identifies the radar frequency band used by the missile and/or radar vehicle.

USAGE

Usage: Mod makers may wish to add jam/spoof capabilities to their mods. To take advantage of these new values, these can currently be collected via script solutions. One example would be to make use of the **incomingMissile** Event Handler. To collect these, the event handler script may include something like this example:

```
_target = _this select 0;
_ammoType = _this select 1;

_HOJ = [(configFile >> "cfgAmmo" >> _ammoType),"pook_HOJ",2] call BIS_fnc_returnConfigEntry;
_Band = [(configFile >> "cfgAmmo" >> _ammoType),"pook_Band",2] call BIS_fnc_returnConfigEntry;
_HOP = [(configFile >> "cfgAmmo" >> _ammoType),"pook_HOP",2] call BIS_fnc_returnConfigEntry;
```

The values this script collects ("_HOJ", "_Band", "_HOP") can then be used to modify the jammer / ECM behavior in a more realistic fashion. For example, the SA-20 missile possesses frequency hopping capabilities to overcome the target's ECM actions. Therefore the mod maker may wish to lower the ECM capabilities against an SA-20 vs. against an SA-3, for example.

SAM RADAR FREQUENCIES

The chart below describes this pack's values as documented on public sources. These values are intended for use in jamming and homing scripts, in order to develop advanced ECM and homing capabilities. Considerations:

- Frequencies are expressed in the most common format of the IEEE designations, where some of the lower bandwidths (A, B) have been designated by IEEE as simply "VHF or UHF".
- The "X-Band" is currently the most common band for weapons guidance due to the inherent trade-off between resolution and fidelity of signal due to attenuation.
- Acquisition (Early-Warning) radars usually work in lower frequencies due to their characteristic behaviors, especially when employed against "stealth" aircraft.
- Some information is not public due to its sensitive nature and is therefore derived from assumptions based on documentation that has been made available.
- ***Historical*** designations overlap and/or transpose certain IEEE designations, making some public documentation appear to be in conflict with this information. The more reliable and IEEE sources were favored when my research discovered conflicting data.

IEEE Standard Radar Band Nomenclature (IEEE Std. 521-2002)														
	MHz			GHz										
	3-30	30-300	300-1000	1-2	2-4	4-8	8-12	12-18	18-27	27-40	40-75	75-110	110-300	
				Band										
IEEE	HF	VHF	UHF	L	S	C	X	Ku	K	Ka	V	W	mm-wave	
Legacy		A	B-C	D	E-F	G-H	I	J		K	L	M		
------- Increasing Frequency ------ >>>>														

Russian-Design Systems												
System	Guidance Radar (I = Infra-Red / IR)				Acquisition Radar (I = Infra-Red / IR)			Targets/ Channels	Missile Track	Home-on-Jam	Frequency Hop Capability?	Missile Modes
	Type	**Band**	**pook_Band**		**Type**	**Band**	**pook_Band**			**pook_HOJ**	**pook_HOP**	
SA-22	1RL-144 / 1RS2	X-Band (Missile Command) Ku-Band (Missile Track)		X	2RL80	S-Band	S	2 / 2 ea	CL	0	0	IR Proximity
SA-21	92N2E "Grave Stone"	X-Band		X	96L6 "Cheese Board"	S-Band / L-Band (?)	L	6 x 2 ea	CL	1	1	Adaptive Radar Proximity
SA-20	30N6E2 "Tomb Stone"	X-Band		X	64N6 "Big Bird"	S-Band	S	6 x 2 ea	TVM	1	1	Adaptive Radar Proximity
SA-10	30N6E "Flap Lid"	X-Band		X	76N6 "Clam Shell"	S-Band	S	6 x 2 ea	CL	1	1	Adaptive Radar Proximity
SA-9 / SA-13	IR			I	L-136 IRST	IR	I	1 x 3 ea	IR	1	0	IR / Laser Proximity
SA-19	1RL-144 "Hot Shot"	J-Band		J	1A27 "Hot Shot"	E-Band	E	2 x 2 ea	CL	0	0	IR Proximity
SA-11 / SA-17	9S35 "Fire Dome"	X-Band		X	9S35 "Fire Dome" / 9S36 "Chair Back"	H/I Band	H	4 x 2 ea	SARH	1	0	Radar Proximity
SA-15	M2E "Tor"	G/H-Band		G	M2E	G/H-Band	G	4x 2 ea	CL	0	0	Radar Proximity
SA-3	SNR-125 "Low Blow"	X-Band		X	P-12 / P-18	A-Band	A	1 x 2 ea	CL	0	0	Radar Proximity
SA-2	SNR-75 "Fan Song"	C-Band		C	P-12 / P-18	A-Band	A	1 x 3 ea	CL	0	0	Radar Proximity

NATO-Design Systems												
System	Guidance Radar				Acquisition Radar			Targets/ Channels	Missile Track	Home-on-Jam	Frequency Hop Capability?	Missile Modes
	Type	**Band**	**pook_Band**		**Type**	**Band**	**pook_Band**			**pook_HOJ**	**pook_HOP**	
MIM-104 PAC-2	AN/MPQ-53	G-Band		G	AN/MPQ-53	G-Band	G	Multiple Target-While-Track	TVM	1	1	Radar Proximity
MIM-104 PAC-3 / MEADS	AN/MPQ-65	G-Band (Radar) Ka-Band (Missile)		G	AN/MPQ-65	G-Band	G	Multiple TWT	TVM, ARH	1	1	Radar Hit-To-Kill
NASAMS	AN/MPQ-64	X-Band		X	AN/MPQ-64	X-Band	X	Multiple TWT	SARH	1	0	Radar Proximity (AIM-120)
MIM-23	AN/MPQ-61	X-Band		X	AN/MPQ-50	C-Band	C	12 x 1 ea	SARH	1	0	Radar Proximity
THAAD	AN/TPY-2	X-Band		X	AN/TPY-2	X-Band	X	Multiple TWT	KKV	1	1	ARH, Hit-To-Kill