

Objective:

Maverick missile employment.  
CCIP cluster bombing.

Planning/preflight:

Today we will learn how to attack enemy mechanized infantry and armor using the AGM-65B "Maverick" air-to-ground missile. The Maverick "B" is a daylight use, fire and forget missile particularly suited for use against tanks and other enemy armor.



We will fly out off the coast from Pohang AFB on the eastern coast of South Korea, turn inbound to the briefed strike area and engage the target formation which will consist of a battalion of Russian armor moving south along a coastal road.

We will be carrying 6 AGM-65B missiles and 2 CBU-97/B SFW (sensor fused weapons) cluster bombs:



The CBU-97/B SFW is ideally suited for attacking enemy armor formations. Essentially this weapon is a cluster bomb that breaks apart and releases 10 sub-munitions which descend under parachute. Each sub-munition contains a further 4 armor piercing projectiles that home in on the IR signature of enemy vehicles. When they detect an IR source they fire downward at the top, relatively lightly armored skin of the targeted vehicle. The objective of this weapon is obviously to destroy multiple armor targets over a relatively small area with a single weapons pass.

Be aware that the armor battalion of T-72 tanks is accompanied by air-defense units in the form of SA-13 vehicles and ZSU-23-4 AAA vehicles.

Debrief:

With my weapons pylons bristling with munitions we depart to go hunting:



On the way to the first waypoint, as usual, we go through our pre-strike weapons set-up. It's worth mentioning in this training mission report that my weapon set-up procedures are highly abbreviated compared to the full procedure. In Falcon 4/SP3 you can select how you wish to start each mission: Start, Taxi, or Takeoff. I always use "Takeoff" which places my aircraft in a mostly combat ready configuration ON the runway awaiting takeoff clearance. If you select Start or Taxi you must go through a much more detailed configuration process including things such as turning on avionics switches, setting weapons and sensor switches, waiting for INS to erect, etc., etc.. I feel it's important to mention this because some people are intimidated by the SP3 manual and the complexity of the avionics. In reality, if you start from take-off, all you are really doing is managing weapons systems in a manner not much different than JF-15 or JF-18.



Here I've switched to Air-to-Ground mode, which automatically brings up the Air-to-Ground radar in the left MFD and the Stores Management System (SMS) in the right MFD. I cycle through the weapons until 6AG65B shows (Maverick), turn the power on to the weapon by selecting that push-button on the MFD, and a few seconds later confirm that the "RDY" message appears in the MFD. The last step is to go down to the bottom of the MFD and press the WPN push-button to take you to the actual weapon image.

Here I had to pause the sim for a second to figure out why I wasn't getting any picture in the MFD. The SP3 manual (pg. 107) provided the answer: I needed to hit the "U" key to uncage the Maverick seeker head, simulating the removal of the seeker-head cover. When I do that the seeker image pops onto the MFD. The "NOT SOI" message means that the Maverick is not the Sensor of Interest, rather the ground radar is still in control.

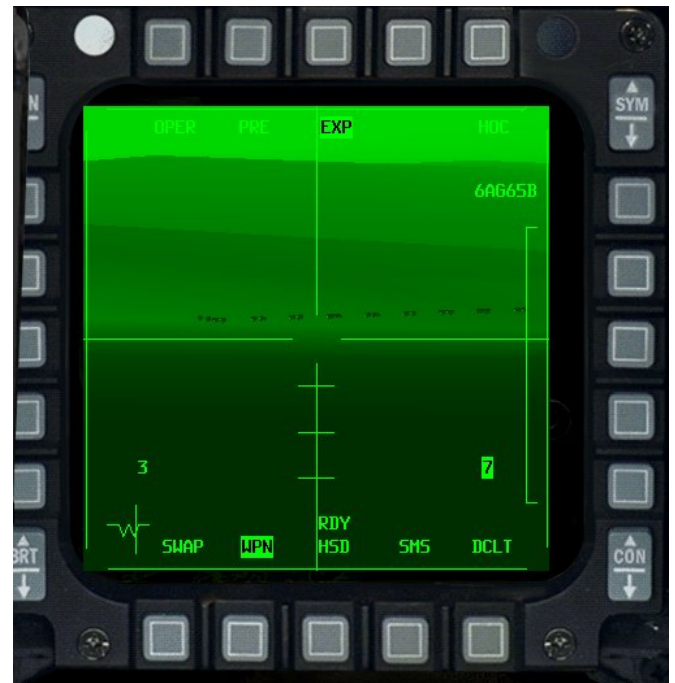
With my weapons ready I reach the IP (WP #2) and turn inbound toward the strike area:



Looking down into the cockpit I select the Ground Moving Target (GMT) mode on the radar and shortly a couple blips show up indicating contact on the armor column:



Slewing the radar cursor over the contact I hit the designate button on the HOTAS which locks up the target on the radar, hands off the SOI control to the Maverick, and slews the Maverick seeker toward the contact.



Hitting the FOV button on the top of the right MFD zooms the Maverick seeker into EXP mode giving a closer look at the target area.

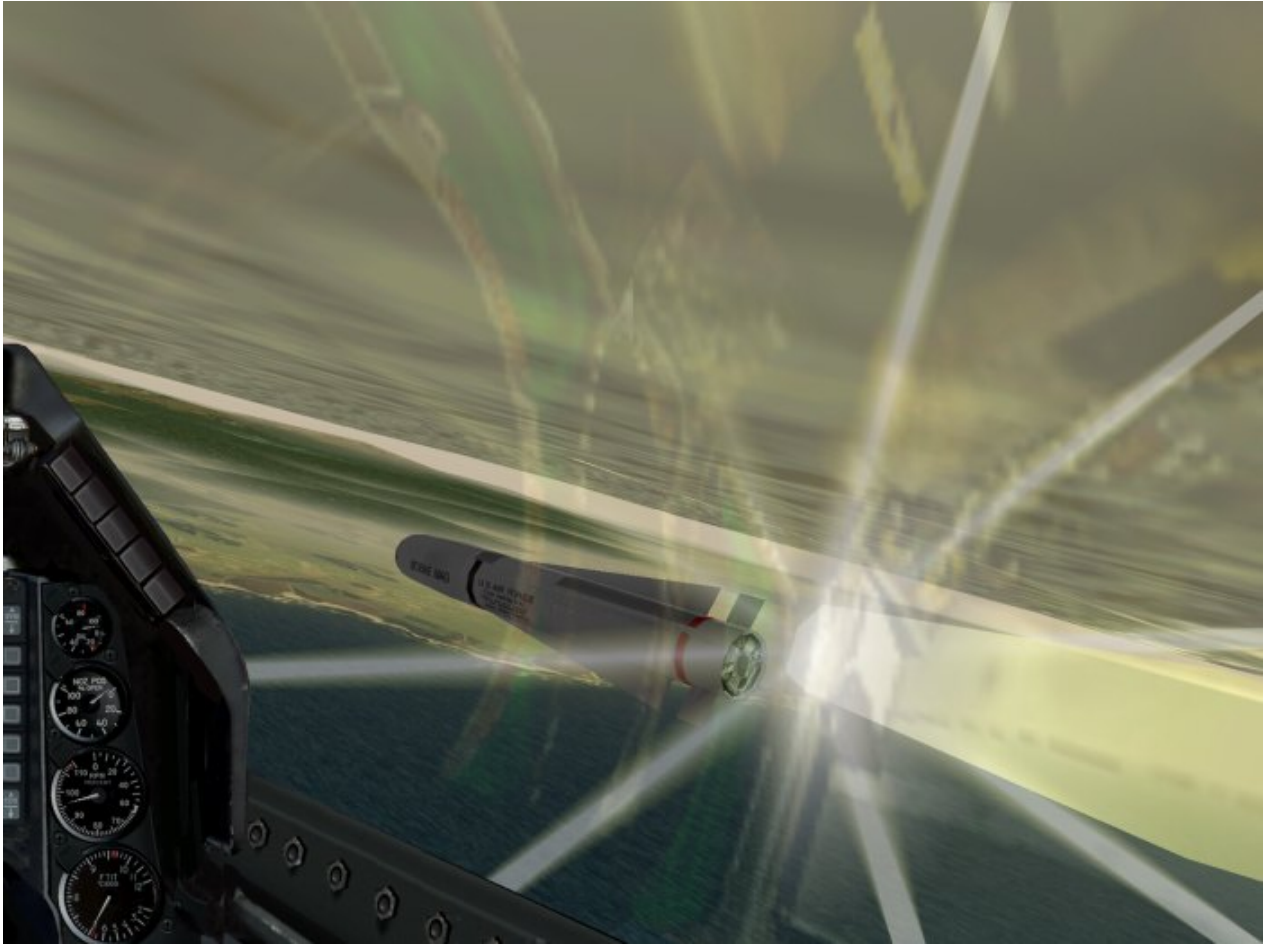
A peek shows what our target is - a T-72:



With the Maverick as the SOI and the view in EXP mode we are able to finely tune our targeting with much smaller cursor movement. When we are satisfied with our target selection we hit the designate button on the HOTAS again locking the Maverick seeker on the tank. The cross located on the MFD simply indicates where the Maverick seeker head is pointing relative the nose of the aircraft; in this case the seeker is pointing slightly below and to the left of the "waterline" of the aircraft. The horizontal ticks across the vertical line in the MFD represent 10, 20 and 30 degrees of off boresight. An important note (pg. 5-33 of the Falcon 4 manual) is that the Maverick seeker head can see targets up to 60 degrees off-axis, but the launch limit is 30 degrees! So it is probably a good idea to roughly line up that cross in the center of the MFD prior to launching. Lastly, you can see a simplified "DLZ" on the right side of the MFD (and in the HUD) which shows whether you are in the launch window for the Maverick:



With our target locked and in range I hit the pickle button and the Maverick comes off the rail:



Simultaneously I make the "Maverick" radio call:



Now, another important consideration. When you are looking at the image on the left MFD it is the actual image that is being picked up by the Maverick's on-board optics. Therefore, when you launch the Maverick and break that optical connection to the missile, the MFD will go blank. If you have another Maverick on your rails simply pressing the "U" key will remove the lens cover from the next Maverick and allow you to see the target again. If you fire your last Maverick you will (obviously) not be able to do this.

An interesting historical note is that A-10 pilots in Gulf War I were not equipped with night targeting systems like the F-16's FLIR. The Warthog pilots, in their creative, can-do way, started using IR-Mavericks as their "Poor Man's FLIR", allowing them to see and engage the enemy at night. The relatively narrow FOV of the Maverick however, was according to one pilot "like trying to fly while looking through a soda-straw".



In any case, I hit the "U" key and the video from my next Maverick pops onto the MFD.



Meanwhile my first Maverick is about to ruin this T-72's day.

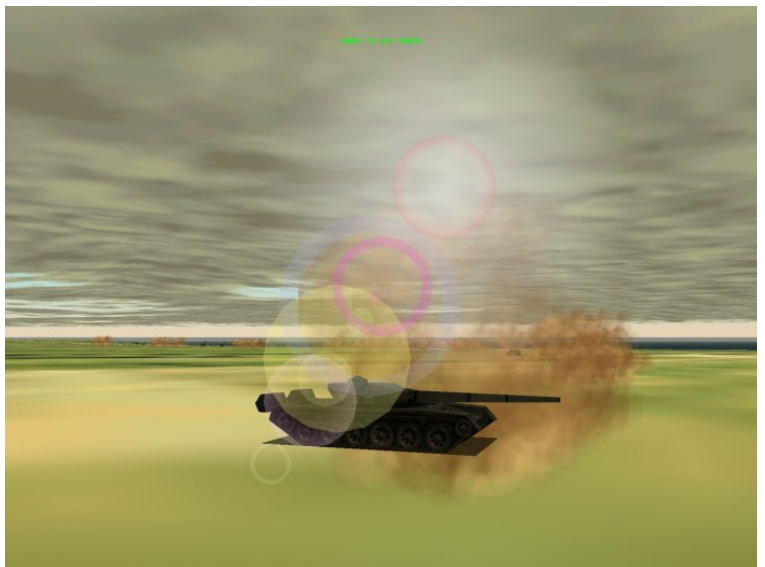
As I close on the enemy convoy I slew the seeker, lock, fire, un-cage, repeat and manage to get 4 missiles off on a single pass. In retrospect, it would have been far wiser to use the missile as it was intended, to provide stand-off range fire and forget capability keeping the aircraft out of harms way. Still the destruction of 4 vehicles on one pass is pretty awesome:



As I pull off after the run the stupidity of my decision to press in is brought to my attention as various caliber weapons go whizzing past my canopy. That ZSU-23-4 is nothing to mess with! Luckily I escape through the onslaught unscathed. Tip: Brown smoke is vehicle dust kicked up by movement, black smoke is from burning vehicles or ordnance, white smoke is bad news and means enemy gunners are firing!



On this mission I release the hounds and let my wingman get some of the action. He proves to be pretty proficient getting 2 or 3 kills on his first pass!

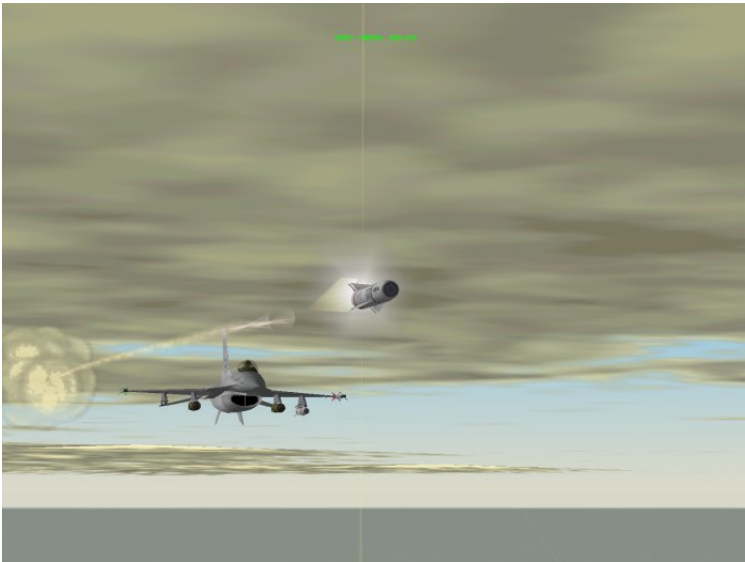


With 2 Mavericks left I circle back out off the coast and set-up to make another pass:



This time I will be using the "bore-sight" mode of the Maverick. This is a handy "quick-draw" method of employing the Maverick. I simply select "BORE" at the top of the right MFD and this centers the Maverick's seeker directly down the center-line of the F-16. Now all I have to do is aim my nose at a target and when he is lined up in the MFD, designate and launch. This saves time over having to slew the seeker head or the radar toward the target. In boresight mode the flight path marker in the HUD changes to a targeting box. Simply fly the aircraft to put the targeting box on the target and it should appear in the MFD:





"Maverick!" two more times and I'm out of missiles.

This falls under the "Better Him Than Me" category.



A little chirp on my threat receiver reminds me that this attack isn't as benign as it looks. An SA-13 is effective up to about 12 or 13 thousand feet and I'm well inside that envelope.

With all of my missiles expended I flip over to the stores management page and cycle to the CBU-97/B. The only change I make is switching from SINGLE to PAIR so that I release both of my canisters on a single pass. Again, in retrospect I should kept them as singles and set the ripple to 2 so that I would get a wider dispersal with the canister. Additionally I think I can set the CBU burst height, but I haven't explored that feature yet.

I fly out and orient myself so that my attack takes place down the axis of the road in an attempt to catch as many vehicles as I can in my CBU pattern:



I'll use a simple CCIP visual bombing mode for this attack.



I hit the pickle button and the canisters drop.

With a twinkle the sub-munitions pop out and spread across the road followed by an impressive series of popcorn explosions as several vehicles are set ablaze:



My wingman makes his last pass on the targets before we form up and head for home:



Back on the ramp with my racks empty I'm ready for a quick-turn so I can get back out there!



#### Conclusions:

The Maverick is an extremely easy to use, effective weapon. No wonder it was so highly regarded in Gulf War I. It's stand-off range and fire-and-forget ability, while ignored by me this time, provide for an effective way to safely pick off targets from relatively long ranges. A smart attack would probably be to target the air-defense vehicles early, reducing the threat during subsequent attacks and allowing for safer employment of more conventional munitions.

The CBU/97B was a little less impressive. I'm not convinced that a well placed 2000 pound bomb might not do just as much damage as the Sensor Fused Weapons. Maybe.

BeachAV8R