

Maverick Deployment

Lesson Version 1.03

This classroom is designed to walk you through the entire process of deploying AGM-65x “Maverick” missiles in the current version of *Falcon 4.0: Allied Force*.

A Brief Introduction to the Maverick

Before we go any further though, it's worth taking a little time to briefly describe what options are available for you to load on your F-16 Falcon. At the time of writing, there are three versions available – the AGM-65B, -D, and -G models. Each version of the Maverick available has differences which make choice dependant on primarily, the target to be attacked, and secondarily, the time of day and weather conditions prevalent.

The B model is equipped with a scene-magnification television seeker, and as such is suited to use in daylight and good weather conditions. It comes with a 125lb high-explosive warhead and is primarily used as an anti-armour weapon but can be deployed against a variety of surface targets.

The D model is equipped with an imaging infrared seeker, and as such is suited to use in darkness, hazy and poor weather conditions. It comes with a 125lb high-explosive warhead and is primarily used as an anti-armour weapon but can be deployed against a variety of surface targets.

The G model uses the same imaging infrared seeker as fitted to the D model. It should be noted the infrared seeker does not preclude it from use on fine days, but care should be taken to ensure a solid lock is achieved to prevent the possibility of target-loss after launch. It comes with a 300lb warhead and is designed for use against hardened bunkers. As such, it features a delayed fuse charge and a penetrator warhead. Also, the seeker is optimised for use against larger targets.

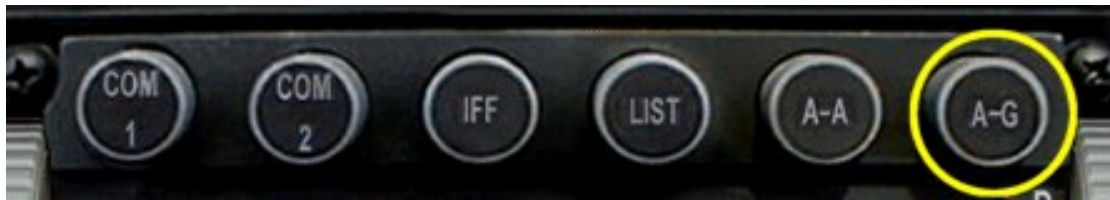
Getting the Maverick Ready for Use

Now we have the boring stuff out of the way, the first things you need to check before anything is a) what is your target and b) what is the best missile for the job. Given the information in the first section, you should now make your choice of missile based on the criteria as per the mission briefing.

When you are happy you have changed your load out to suit, it is worth having a quick look at the recon screen. This will give you some idea what the targets you are about to attack look like, where the targets are positioned, etc.

If you're sure you're ready to go, hit the FLY button and we'll go and have some fun. Once in the cockpit, you have a couple choices to make straight away. First off, as you're going to be firing Mavericks, it's a good idea to set up your two required slots on one MFD accordingly. If you're doing a ramp start, you can do this while waiting for your INS to align, otherwise you can do this in-flight as part of your fence-in checks. To set up your MFD slots is easy enough – you are going to need two in particular, SMS (Store Management System) and WPN (Weapon).

First off, you need to put the airplane into the Air-to-Ground mode. The easiest and quickest way to do this is hit the A-G Master Mode button (circled) on the UFC:



Upon hitting the A-G Master Mode button, one of your MFDs (probably the right hand one) will change to look like this. The image is currently showing the SMS page. Of primary interest to us right now are the 3 currently programmed slots – BLANK, HSD, and SMS. You'll notice there are in fact only two labels showing – HSD and SMS, which is also inversed. This tells us SMS is active, HSD is available, and the third is empty, thus BLANK.



Now go ahead and hit the push-button below the currently empty, or blank, slot. The display will change to look like this. What we are going to do next is select a new content for this empty slot, so go ahead and hit the push-button below the blank slot again.



All being well, your MFD will now look like this. What you are currently looking at is a menu showing all available MFD pages available to you within *Falcon4: Allied Force*. You've probably noticed already the BLANK selector is inversed. This is just a confirmation this is the currently programmed page. You're aiming to use this slot as your WEP or weapon page, so go ahead and hit the push-button alongside the WPN label.



Okay, so now you'll notice the label for the slot has changed to WPN, and is inversed. What this confirms is you have successfully programmed the slot to display WPN information, and it's the current active slot. You've no doubt noticed a whole new bunch of labels too, but we'll come back to them later on. Now you have sorted your slots, we can concentrate on setting up the Maverick missile for firing. Hit the SMS push-button and we'll do that now.



Getting back to the SMS page, what you need to do now is power up the Maverick missiles. You'll notice down the right side of the MFD, one of the buttons is carrying the PWR OFF label, which believe it or not is the power status of the missile(s). Go ahead and hit the button.



Unsurprisingly, the label has changed and now reads PWR ON, this confirms to you the Mavericks are powered on. You'll also be happy to know this is you pretty much finished with the SMS page for now. This **doesn't** mean the Mavs ready to go though. Change back to the WPN page and you'll see what I mean.



As you can see, there is a message waiting for you that reads NOT TIMED OUT. In real life (and indeed in later BMS versions of F4), you'll need to wait some three minutes for this message to disappear. In *Allied Force*, you need to wait around five seconds for the Mavs to "warm up".



So you've sat patiently waiting for the Mavs to warm up, and before you know it the message has gone. Looking at the MFD you're probably thinking I've been stringing you along because still you see nothing but a black screen. Trust me, I haven't... what in fact you're now looking at is the back of a protective lens cover. You have to remove the cover, or "uncage" the missile. To do this, simply hit the U key on your keyboard.



Now you'll notice some new additions to the display, a large cross which has some graduations on its lower leg, a gate which is the "four corners of a box" in the middle of the display, a small pointing cross, and a ranging scale down the lower right of the image. Also, you'll notice because you're in PRE mode (top second left label) a NOT SOI message. But you're still looking at a black screen, so what gives? You've done everything asked so all should be working but you've got one more thing to do. Master Arm ON?



That's better! Without the Master Arm being switched on, nothing will happen no matter how many buttons you push. Actually, chances are you've already Master Armed, but I wanted to go through every step required just in case there are times when perhaps the Ingress will be very quiet and you'll have had no need to, or indeed you just plain forgot to!

So to summarise so far –

- Enter A-G Master Mode
- Ensure SMS and WEP slots are selected on an MFD
- Power up the missile (SMS page)
- Wait for the missile to warm up (WEP page)
- Uncage the missile seeker (WEP page)
- Master Arm to On

So now we have all the admin out of the way, it's time to look at finding, locking up, and destroying targets. This is where the fun *really* begins...

The WPN Page Explained

It's probably worth taking a little time out right here to explain fully what each of the labels mean on the WPN page whilst displaying a Maverick image. As it turns out, there are only a couple you are really interested in, so this won't take much more than a couple minutes.



Starting with the top row of labels, far left you can see OPER. This reads STBY when the Mavericks are not powered up.

Next to this, you can see the label PRE. This is a mode switch used to cycle between the available aiming modes - PRE, VIS, and BORE.

PRE (Preplanned) mode is slaved to the radar, or in other words, the Maverick missile will take all its targeting and aiming instructions from the radar.

BORE (Boresight) mode is the method used where the missile seeker itself is used as the aiming device.

VIS (Visual) mode is similar to BORE mode, but a little less flexible.

In the middle of the top row is the FOV label. Again, this is a mode switch and toggles between the standard and zoomed view. Hitting this push-button once will expand the view and hitting it again will return the view to normal.

Far top right is the HOC label, which stands for Hot On Cold. Again, it's a mode switch but it isn't implemented in *Allied Force*.

Below this, the top right shows 9990 then 6AG65D. This is a visual indicator showing both altitude information and a confirmation of the number and type of missile available to you. The altitude info we'll come back to shortly.

Finding and Locking Up Targets

You have now reached the stage in the lesson where you can actually start looking for your targets. As touched on earlier, there are three modes available to you to deploy the Maverick - PRE, VIS, and BORE. In this lesson, you'll learn how to use the first and the last modes. As the default method is PRE (Preplanned) you'll start here.

Using PRE (Preplanned) mode

Please note for the purposes of remainder of this lesson, I will be assuming you are proficient in the use of the radar and how to select the required modes, i.e. GM, GMT, and SEA, and the various levels of expansion available in each.

PRE mode takes its primary targeting information from your radar. Obviously, because you are in A-G mode, your radar should be displaying a GM (Ground Mapping) picture. If you are not looking at a GM radar page, go ahead and change to it now.



Now you'll notice the radar cursors are focused on your primary target area, in this mission Wonsan Airbase. You could of course zoom in to use DBS, but there's no real need to do this.



Looking at the image being generated in the WPN page confirms the radar is pointing at Wonsan, and in particular what appears to be a hangar. As you're still a fair distance from the target zone and the image does make it a little difficult to identify exactly the target you're looking for, you need to get closer. There are two ways to do this – either fly your F-16 towards the target zone until you can make out better the image, or far more preferable, hit the FOV push-button. Do it now.



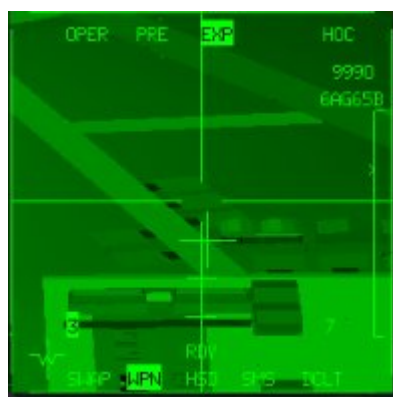
Good, thanks to the FOV option you can now see much better what the radar is pointing at. Remember, because you are using PRE mode, you are still taking targeting cues from the radar. You'll also notice the FOV label now reads EXP. This serves as a reminder the zoomed option is currently in use. You'll also notice that the gate has disappeared, as currently it serves no purpose other than to give an indication of the zoomable area. You'll observe its second use later.

Let's take a minute here to discuss the other visual indicators mentioned earlier. You'll no doubt have worked out the middle of the large cross is the primary aiming visual, and is used to point directly to the target. Also part of the large cross is three horizontal lines. These are to be used in conjunction with the small pointing cross. What they actually show is the degree of deflection of the seeker head in the Maverick. In the image above, you can see the seeker is looking straight ahead, and approximately 8 degrees down from its longitudinal axis. This is important information because although the Maverick missile seeker head has gimbal limits of 60 degrees, it can only lock onto a target within 30 degrees of its axis. Finally the

ranging scale in the lower right corner works just like any other you've come across. An arrowhead slides down the scale to indicate maximum to minimum firing range.

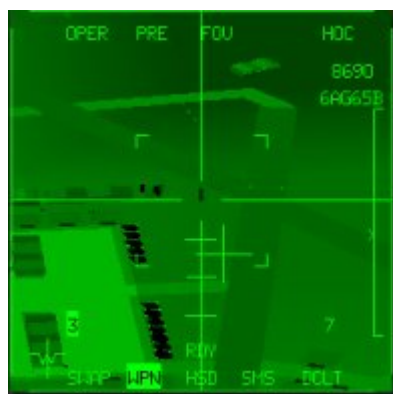


To lock up a target, you must now do two things. First off, you must ground stabilise the missile seeker, and this is done by simply hitting the Target Designate (Keypad 0) key. Upon doing so, first you'll notice the radar display changes to reflect the fact it is now locked onto the hangar, and also displays the message NOT SOI. You'll also notice the "border" around the display has been removed.



Looking back at the WEP page, you'll notice the NOT SOI is gone, and the border is now present. What this indicates is the radar has handed off aiming control to the Maverick, and the missile is stabilised. Now you can concentrate on finalising the lock in preparation for loosing off the missile. Notice also the pointing cross is flashing.

Just for a bit of fun, hit the push-button above the EXP label.



Now you've got a larger area to look at, slew the cursor to the right a little. You'll notice the pointing cross is moving to the right also indicating the seeker header is offsetting from the missiles longitudinal axis. In this picture, the head has moved approximately 5 degrees right and is now 15 degrees down off the axis – well within the 30-degree gimbal limit required for a lock.

Try to point the seeker at the tall thin tower.

It's worth bearing in mind that while slewing the seeker head searching for targets you'll be covering the ground at somewhere in region of 7 miles per minute, so you don't want to take too long about this. Also, if when you slew the seeker the display moves really quickly, chances are you haven't ground stabilised properly or the lock has been lost, in which case you really need to go back to the beginning of this section and start again.



Once you've found the tower, go back to EXP mode then if required adjust the aim by slewing again. When you're happy with the alignment of the seeker head, hit the Target Designate (Keypad 0) key again. The pointing cross will now stop flashing and the display will be solid. This indicates a good lock and the Maverick is now ready to fire. The only thing that remains is to check you're within range, and hit the Pickle (Spacebar) button.

Once you have a target locked up, if you decide you wish to change targets, you can hit the Target Undesignate (Keypad .) key once to allow slewing of the seeker head, or twice to return the SOI to the A-G radar.



Once the missile has left the rail, the WEP display will return to look like the image on the left. The seeker head image is immediately lost – this is because the display is created using seeker head information. As the seeker head has left your plane along with the missile, obviously the image is lost also. SOI will remain with the WEP page. To continue firing your stores, you'll need to uncage the next missile and repeat the process, remembering the Ground Stabilised lock remains.

Finally, as promised, I'll mention the altitude information touched upon earlier. It's worth pointing out straight away that if your radar altimeter is switched off or in standby, the readout is not present. You'll remember this is present on the WEP page directly above the number and type of missiles remaining label. As the Maverick deployment sequence is predominantly a "head-down in the cockpit" procedure, this is to assist you from getting too low. It's a radar altitude reading from 9,990 to zero feet AGL. Obviously you don't want it getting to zero because bad stuff happens. It's always a good idea to set ALOW at 2,000 feet as a second warning of an impending ground collision.

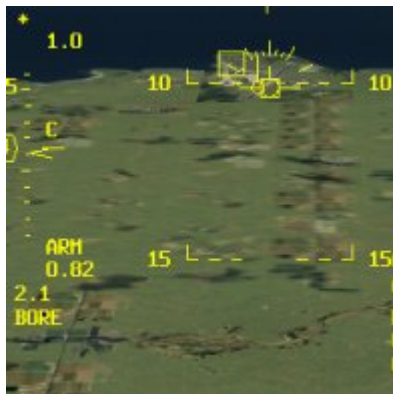
Note – there is currently a bug in F4: AF that means this readout doesn't work properly. It will only give updates if the HUD is in view also. If the view is shifted down, the readout freezes and doesn't update until the HUD is visible again. As such, you cannot rely too much on it currently.

Using BORE (Boresight) mode

To use the Mavericks in BORE mode is very similar in concept to PRE mode. Perhaps the biggest difference in the procedure is that initial target location is done via the HUD. When BORE is selected, and before the Maverick seeker head is ground stabilised, you will actually point the missile using your jet!



To change the Maverick to BORE mode, quite simply hit the PRE push-button twice, it will cycle through the PRE to VIS to BORE mode. Hitting it again will cycle back through to PRE mode. As a point of note, if you change out of A-G master mode or cycle to a different A-G weapon, upon calling up the Mavericks again, the system will default back to PRE mode. Also, you can cycle Maverick modes from either the SMS or WEP page.



In the first instance, let's take a look at the HUD when the missile is in BORE mode. There are a number of things to take note of. First, in the extreme top left of the image, just above the G indicator, you'll notice an asterisk. This is your indication the HUD is the current SOI. In the bottom left of the image you'll see the BORE HUD mode discreet. This is confirmation of the current missile mode. Now look carefully at the flight path marker, there is actually a small square there also. This small square is your missile aim point. The objective here is to put

the aim point square in the general vicinity of your intended target, so as mentioned earlier, steer your jet until the square is close to your intended target.



Once you are happy you have the aim point in the general target area, hit the Target Designate (Keypad 0) key once to ground stabilise (predesignate) the missile seeker. You will see now the SOI asterisk has gone, indicating the HUD is no longer SOI. Once ground stabilised, you'll be able to manouver the jet as necessary without the seeker head following. Remember however, you only have gimbal limits of 30 degrees within which you can make a lock, and 60 degrees before the ground stabilise lock is lost, in which instance SOI returns to the HUD.

Remember if you are unhappy with your predesignated location you can use the Undesignate (Keypad .) key, return the SOI to the HUD, and start again.



Now its time to go heads-down again and concentrate on the WEP page. You can see visually where your ground stabilise lock has parked the seeker head.



Slew the seeker head until you find the radar tower. I'll take minute here to explain the gate's second (but perhaps primary) function. In versions before *Allied Force* the gate would "breathe", or expand and contract, when a valid target was identified and could be locked onto. This doesn't happen currently in *Allied Force* but I'm mentioning it now in case you are using this guide with an earlier version of *F4*.



Back to the task in hand; don't forget you always have the option to hit the FOV push-button to zoom in to assist you in target identification. When you are happy you have identified the correct target, hit the Target Designate (Keypad 0) key to lock up the target. The pointing cross will stop flashing indicating a valid lock – hit the Pickle (Spacebar) button to fire the missile.

Once you have a target locked up, if you decide you wish to change targets, you can hit the Target Undesignate (Keypad .) key once to allow slewing of the seeker head, or twice to return the SOI to the HUD.



Once the missile has left the rail, the WEP display will return to look like the image on the left. The seeker head image is immediately lost – this is because the display is created using seeker head information. As the seeker head has left your plane along with the missile, obviously the image is lost also. SOI will remain with the WEP page. To continue firing your stores, you'll need to uncage the next missile and repeat the process, remembering the Ground Stabilised lock remains.

Using VIS (Visual) mode

VIS (Visual) mode is exactly the same as BORE mode in procedure, but is less useful because the A-G radar switches to an AGR (Air-Ground Ranging) mode. As a result, no information regarding contacts and potential targets can be yielded from the radar. In practice I never use this mode, however this is no reason you shouldn't try it out to become familiar with it. It is just possible after all your radar can be damaged in flight.

Summary

To prepare the jet for Maverick Deployment:

- Master Arm On.
- Enter A-G Master Mode.
- Ensure SMS and WEP slots are selected on an MFD.
- Power up the missile (SMS page).
- Wait for the missile to warm up (WEP page).
- Uncage the missile seeker (WEP page).

To use the Maverick in PRE mode:

- Find target locale using A-G Radar GM, GMT, or SEA sub-mode.
- Ground Stabilise the missile by locking the radar onto a contact in the locale.
- Slew the WEP image Normal and Expanded view to identify your intended target.
- Lock the missile onto your target.
- Check range to target, and fire the missile.

To use the Maverick in BORE mode:

- Find target locale using the Aim Point square in the HUD.
- Ground Stabilise the missile by predesignating the seeker head.
- Slew the WEP image Normal and Expanded view to identify your intended target.
- Lock the missile onto your target.
- Check range to target, and fire the missile.