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Topic: Falcon 4.0 Training Mission Report #04
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posted 08-30-2003 23:38


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08/30/03

Falcon 4.0/SP3 Training Mission Report #04

Objective:

Demonstrate aerial refueling procedures.
 TACAN air and ground navigation.

Planning/preflight:

Falcon 4/SP3 has apparently dramatically improved the fuel burn characteristics of both user and AI controlled aircraft. Apparently the fuel burn values in the original Falcon 4 were far under-modeled resulting in much lower fuel burns than one would encounter in real life. The SP3 team has fixed that and now fuel management has become an integral part of the Falcon 4 experience. Making sure you have enough fuel to get to the target, engage the target and egress with sufficient reserves for contingencies is part of the pre-flight planning process. Will there be a tanker available? What kind of drag penalty will your ordnance impose on you? Will a low altitude ingress to the target area consume too much fuel? Will you have sufficient fuel to engage enemy air if you are bounced? All of these questions (and more) should enter your mind when planning for your mission.

Today we will fly out and rendezvous with a KC-10 refueling tanker to familiarize ourselves with tanking operations.

Debrief:

We are airborne in the training area and a KC-10 tanker is out there waiting for us. There are generally two ways to find the tanker. The first is to query AWACS and get a vector to the tanker; this is generally the easiest. The second method is to use the tanker's TACAN frequency to navigate to it using your TACAN receiver. AWACS will give you the TACAN frequency when you make the tanker query.

In the training mission the tanker is conveniently located a few miles in front of us. I lock him up on the radar (to provide range and closure data) and proceed to close on him:



Taking a glance at my right sub-panel I note the fuel quantity is 1800 lbs., giving me plenty of margin to attempt the tanking evolution:



Approaching the tanker I request fuel from him on the radio and he will slow and enter a race-track pattern (something that the SP3 team has fixed!). With SP3 you must also now open your refueling door (Shift-R) in order to connect to the tanker.



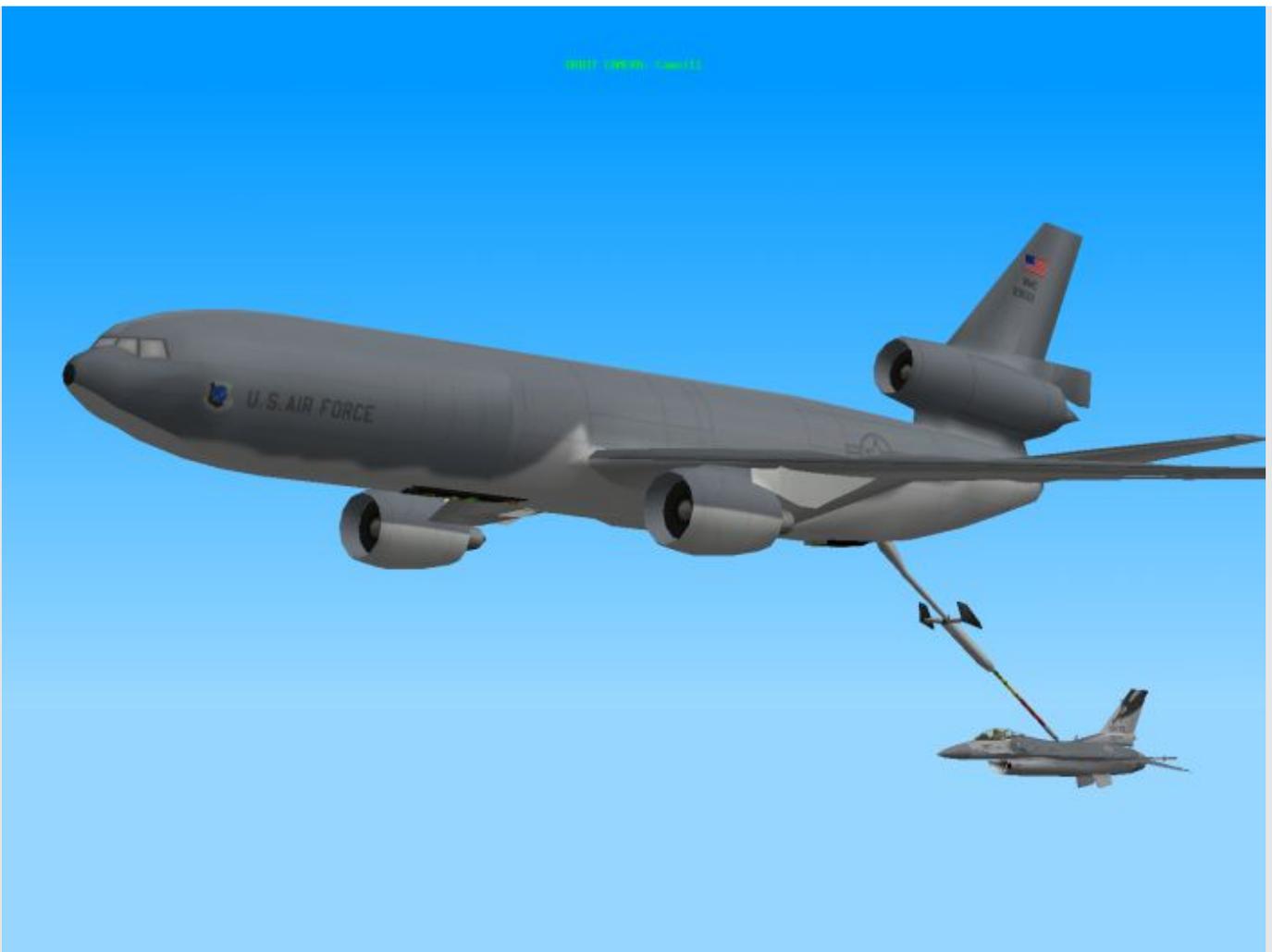
Turning off your radar before rendezvousing with the tanker is considered good form so that you will not irradiate the boom operator in the tanker and cause him to have 4 headed kids. You can turn the radar to "QUIET" using the toggle switch just to the right of the left MFD, when you select this a "NO RAD" message will appear in the top of your HUD and additionally a green light in the center cluster of lights on the right side of the HUD frame illuminates, but for the life of me I can't remember what it says (in this picture it is NOT illuminated yet because I have not opened the refuel door yet):



Radio the tanker that you are ready to receive fuel and he will start giving you directions to fly faster or slow, up or down. Small corrections are the key to successful refueling, and I found the tip that Keith Rosenkranz author of "Vipers In the Storm" of occasionally wiggling your fingers while refueling really helps you relax. (If you are a fan of Falcon 4 and have NOT read Rosenkranz's excellent book about his experience flying the Falcon in the first Gulf War you MUST go find it and read it!)



Once you are in position below the tanker the boom operator will fly the boom into the tanking receptacle behind your cockpit and you will get a radio call indicating you are connected. Position lights exist on the belly of the KC-10 that can help you with your position while under the tanker.





In the real world straight and level tanking doesn't happen (unless you are flying over the "Pond"). Tankers fly "tracks" in order to maintain a certain position in the sky. The awesome guys of SP3 have altered Falcon 4 to allow for different tankers speeds and patterns for turbo-prop and jet aircraft. The "jet" tanker track is 60 x 25 nm with the 25 nm legs being the "turn" legs of a gentle enough nature to allow tanking aircraft to stay on the boom throughout. Not only can you turn and tank with SP3 but the tanker will warn you when the turn is coming! (read all the details in the excellent SP3 manual page 147..)

Unfortunately the turn still got me a bit bobbled as I over-controlled and I got a disconnect after a few warnings to "stabilize" by the boom operator:



Cont...

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After the disconnect I eased back up on the tanker in the turn and after a bit of sweating and aborted attempts finally managed to get hooked back in again. Connecting in the turn is definitely more challenging than on the straight legs of the pattern, but the feeling of accomplishment is awesome when you manage (use full real settings, it's fun!):



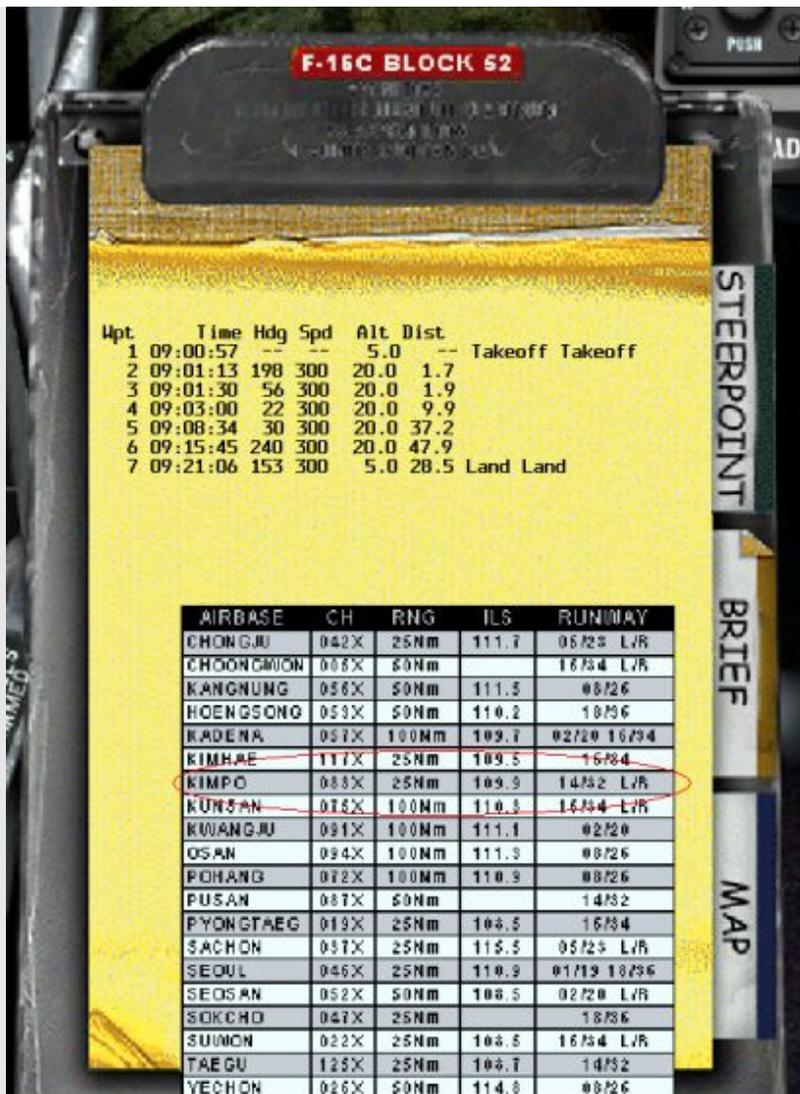
After a couple short minutes the tanks are full and the boom operator disconnects and the exercise is over:



Now to find my way back to my home base (Kimpo). There are many ways to navigate in Falcon 4. There is dead reckoning: fly a course for a certain time and you will arrive at point A based on your calculations. There is pilotage, where you compare what you see out the window with what is on your map. Pilotage can be difficult if you are unfamiliar with the terrain, geography or population centers. The last thing you want to do if you are flying in Korea is get lost; you could end up crossing the DMZ and getting yourself in a world of hurt! (Don't believe me: read this recent account of an OH-58 helicopter accidentally straying over the DMZ: <http://www.army.mil/soldiers/feb95/p4.html>)

Pilotage and dead-reckoning (dead for sure if you miscalculate!) are good cross checks for electronic navigation. One of the easiest ways to find your way home is to query AWACS for a vector to "home-plate". They will give you a bearing and distance to fly. Alternatively you can use your inertial navigation system to take you home by selecting the "home" waypoint and flying to it. Be careful that your "direct" route doesn't take you across enemy territory or known SAM locations! You can also use your TACAN to home in airbases by tuning in the TACAN frequency to you receiver so long as you are within the "service volume" (ie: range) of the TACAN station.

Looking at my kneeboard I determine the TACAN frequency for Kimpo is 088X and it has a range of 25 nautical miles (not much!):



Turning to my left sub-panel I find the TACAN receiver and am about to switch the frequency from 057Y (the tanker) to Kimpo's 088X. Additionally I want to move the TACAN function switch up to T/R (Transmit/Receive) to receive the ground station. When it is in AA/TR it receives airborne TACAN signals (ie: the tanker):



Now looking at my HSI on the middle panel I make sure the Mode selector is on TCN. If the receiver is within range of the TACAN station the red flag in the DME window will go away and I will start getting DME information, this case 16 DME (nautical miles). In order to fly direct to the station, click on the course knob to rotate the HSI needle until it centers with a TO flag (red arrow) and simply turn to match that heading and you'll be flying direct TO the TACAN:



Cont...

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A few miles short of Kimpo I pass this tempting short little airstrip that this dumb aviator just can't resist trying out:



Turning downwind I look over my shoulder at the very short strip and start wondering if this is a good idea:





In the turn to the base leg I drop the gear:



The runway seems to get shorter the closer I get to it:



One thing I've forgotten is that I've just taken on 7000 pounds of fuel, meaning I need to fly a bit higher "ref" speed. Unfortunately, in my attempt to land right at the beginning of the runway I get a bit of a high attitude and my sink rate starts increasing:



I slam into the runway, drag the tail but don't collapse the gear, but the damage is done! I roll to a stop and my engine shuts itself down as all my panels light up:





How am I going to explain this one to my squadron commander??!

Conclusions:

Refueling is a pretty challenging process. If you are on fumes or even have any question about being able to hook up in time to get fuel perhaps it would be faster to head to an alternate airfield (always keep your options open!). Thankfully I've had practice in Jane's F-15, Jane's F-18 and Flanker 2.51, so refueling wasn't terribly difficult. My opinion may change however once we sling a bunch of draggy munitions on the airframe and the aircraft wallows around!

BeachAV8R

PS – A link to the Vipers In the Storm web-page. I can't stress enough how awesome this book is to the aspiring Falcon 4 pilot!

http://www.vipersinthestorm.com/html/main_page.html

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