Aerosoft F-14A/B

Volume **7**

Carrier Operations

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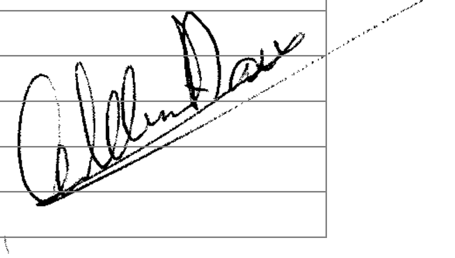
RECORD OF REVISIONS

Revision	Issue date	Release	Description
0	Nov 25, 2014	1.0	Initial Release



CONTENTS

CATAPULT LAUNCH

A custom catapult sequence has been implemented for the F-14, and is active for all carriers, not just CV-63. The control with the simulator are similar, with a few two differences covered in the steps below.

1) Once you are ready to taxi, check to ensure that the Nose Wheel Steering is active. This will be indicated by the **NWS** light on the left side of the windscreen. If inactive, press Tailwheel Lock [Shift+G].

2) Once NWS can been confirmed active, being taxing to your desired catapult. Different gross weights will require different amounts of throttle to get rolling, but in general small increments will usually go a long way.

3) When either in position, or directly in line with the catapult track, you can begin to crouch the nose gear by pressing **Water Rudder [Shift+W]**. Note that *when the nose gear is compressed nose wheel steering is inhibited*, so any corrections in line-up will need to be made with the nose gear extened.

4) When in position, arm the **Take-off Assist [Shift+I]**. Next, check that flaps are set to full. If you are practicing Carriers Qualification and have recently trapped, check that the Tailhook is retracted, DLC is stowed, and the SpeedBrake is closed. One difference in the F-14's catapult logic is that the aircraft must be in the proper configuration before you will be allowed to launch. Expect to be harassed by the Aircraft Handling Officer (AHCO) if something is out of order.

5) Check that the **Inlet Ramps** are set to **Auto Mode**.

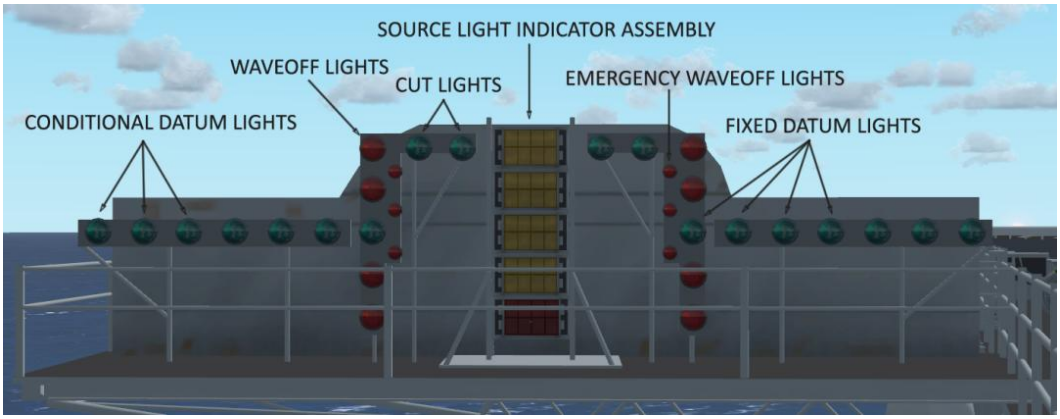
6) Once the launch bar has been locked in, spool up to **MIL Thrust [F4, 1st tap]**. Check engine gauges for normal operation.

7) Go to **Zone 5 Afterburner [F4, 2nd tap]**. Note, that only the A model F-14 requires afterburner, and the B model can launch from MIL.

8) Trigger the **Catapult Launch [Shift + Spacebar]**. Apply heavy back stick until the aircraft begins to rotate. Let the nose pull up to 15-20° pitch attitude and hold. As the gross weight of the aircraft increases, expect a greater prevalence in un-commanded rolling movement (wing-rock).

FRESNEL LENS OPTICAL LANDING SYSTEM (FLOLS)

FLOLS is a visual landing aid which provides the primary glideslope information to pilots attempting carrier landings. The Kitty Hawk is equipped with Mk 6 Mod 3 FLOLS. It consists of a series of datum lights and a "ball" (or "meatball" in Navy parlance). Pilots determine their relation to the desired glide path by the position of the ball in reference to the datum lights. If the ball is above the datum lights, the plane is too high; if below datum lights, the plane is too low. The optics of the fresnel system causes the meatball to act as if projected from a source 150 ft behind the assembly. In addition to the source light assembly and the datum lights, the FLOLS includes the wave-off lights, cut lights and emergency wave-off lights.



On the Aerosoft Kitty Hawk, the FLOLS is built from scratch and presents a considerable improvement over the default meatball effect found on Acceleration carriers. The most significant difference that contributes to the realism of carrier landings is that the Kitty Hawk lens assembly is adjusted for a **glideslope angle of 3.50°**. The lower angle (compared to the 4.0° glideslope of Acceleration carriers) allows for smoother landings.

Since the meatball is automatically operated, rather than a built in effect, it takes into consideration the hook-to-eye distance of the approaching aircraft, so that each aircraft traps the 3rd wire when flying center ball. This applies not just to the Tomcat, but to a number of other naval aircraft available for FSX.

The final improvement is the accurate assembly size, which gives a proper simulation of how small the lens really is on the real aircraft carrier when viewed from a distance.

Low | Little low | On glideslope | Little high | High | Wave-off

Meatball position relative to datum lights

The lens should be visible from within 1.5 miles and does not require any action on part of the pilot to activate (such as tuning a frequency). However, when approaching in an aircraft different than the Aerosoft F-14, you will need to manually insert a line in your aircraft.cfg, so you have the gauge that controls the FLOLS. Again, you will not need to interact with the gauge in any way, it's enough to have it installed. The gauge itself will be placed in your FSX/Gauges directory when the Kitty Hawk is installed, and you don't need to move it.

APPROACH

Note: This section was written by a retired Naval Aviator. It is information dense and will take several alternating cycles of reading and simulation practice to be fully absorbed.

Before describing the conduct of the carrier approach and flying the ball, it is important to understand the primary underlying difference between flying carrier aircraft and non-carrier aircraft, the Angle of Attack (AOA) approach concept.

As you are no doubt aware, pilots of most conventional aircraft fly approach turns and final approach with reference to an airspeed, often adjusting this airspeed for weight if it is capable of changing substantially. Some aircraft even implement an AOA Indexer as a reference to ensure the proper landing AOA in the flare. However, unlike land based aircraft, *carrier aircraft are designed to be flown primarily by reference to AOA throughout the entire approach turn and landing*. There are two reasons for this:

1) The accuracy provided by the AOA Indicator is much greater than that of a conventional (i.e. non-HUD) airspeed indicator. Compared to a standard "steam gauge" airspeed indicator, a Naval Aviator can maintain optimum airspeed to within a knot or two by using AOA. Moreover, while the optimum *airspeed* for an approach will change according to weight, *the optimum AOA will always remain the same for a given configuration*.

2) More importantly, *optimum AOA ensures the maintenance of the proper hook to eye relationship of the aircraft when conducting the carrier approach*. To explain: the FLOLS (i.e. the "Ball") projects an angular up the glideslope slice only 1.7 degrees in height from top to bottom. At three quarters of a mile, the entire viewable area of the lens will only be visible in a window that is approximately 148ft tall. At touchdown, due to the fact that the ball is represented by an angle, the total viewable area of the lens shrinks to a mere 13.6ft in height, while the height of a perfectly centered ball is only 1.1ft. So, assuming even the very nicest day for yachting, you will still only catch the coveted three wire when you fly your 1ft tall head through a window that is 1.1ft tall from top to bottom…at an airspeed of about 120kts.

   Of course, you don't actually catch the three wire with your head (well, at least not twice). You catch the three wire with your hook point…which is dangling 40ft away. Because of this relationship, very small changes to AOA/airspeed can swing that hook point up or down quite dramatically. This can turn an OK three wire into a bolter; or turn a somewhat low approach into a hook strike on the round down.

It is for these two reasons that the carrier approach is flown entirely at optimum AOA. It should be established as soon as possible on the downwind and maintained throughout the approach turn and subsequent landing.

Flying via reference to AOA requires a slight shift in thinking. Under normal circumstances, you control the altitude (or by extension, the rate of descent) of an aircraft by adjusting pitch attitude and control airspeed by adjusting the throttle. In a carrier approach you do entirely the opposite. In practice this is not quite as difficult as it sounds, because you are really *maintaining* the nose attitude at a constant AOA, while controlling descent rate with thrust. Thus, when you are low in the pattern the LSO will call "POWER" and not "PULL UP", and you should fight the urge to pull back on the stick and instead focus on moving the throttles.

FLYING BY AOA

TRIM

The key to holding a constant AOA in the carrier approach is the proper use of trim. Not that using trim to hold a constant AOA on approach is limited to naval aircraft by any means. Any Cessna will hold the AOA it is trimmed for. Of course, lacking an AOA indicator, it will be manifested to the pilot as a constant airspeed. In this regard, a Cessna pilot trying to hold a 75kt approach speed when the aircraft is trimmed for 65kts, will find himself continually correcting for a low airspeed condition. This is because every time the pilot looks away from the airspeed indicator, he will relax stick pressure and the aircraft will subtly trend back towards its trimmed speed.

Similarly, a carrier aircraft will always tend to drift back towards its trimmed AOA on approach. Thus, if the aircraft is trimmed to optimum AOA, then the pilot will find maintaining that AoA is relatively easy. If the aircraft is trimmed for a different AOA however, then the pilot will continually be fighting the aircraft to maintain "On Speed".

This can often be a subtle effect as the tolerances of the indexer are very small, but here's a trick. If you feel that you have trimmed the aircraft hands off for flight at optimum AOA but, as you fly the approach turn, you continually find yourself on the slightly fast (or less frequently, slow) side, it's not the plane…it's you. Put several "clicks" of trim in the appropriate direction and see if it doesn't improve matters a little. (*the red "up" chevron means trim nose up, and vice versa*). If not, repeat.

Also remember that the AOA indexer only has five indications (full fast/slow, slightly fast/slow, and on speed). So after an adjustment, you may well be less fast than you were before the trim adjustment, but still faster than on speed. Don't be complacent. Continue to fine tune the trim until the amber "on speed" donut is what you see the majority of the time. It will fluctuate as you make power corrections a bit so, while you should strive for perfection…don't expect it.

THREE PART POWER CORRECTIONS

Landing on an aircraft carrier is essentially a matter of managing the aircraft's rate of descent from the abeam to the carrier deck. To do this, *a pilot is actually managing the energy state of the aircraft to achieve that desired rate of descent.*

Consider the following example:

An aircraft is descending on a glideslope that would ideally require a 700ft per minute rate of descent. However, the aircraft is descending at 800ft per minute. This aircraft is underpowered and will soon be low on glideslope. To correct this low condition, the pilot must add power. The aircraft's rate of descent after power correction is now 600ft per minute. This will allow it to climb (actually descend less) back up onto the glideslope. However, if this power is left on the aircraft it will eventually continue to climb above the glideslope, and so most of that power addition must be removed. When all of the added power is removed, this will of course leave the aircraft with its original problem of being underpowered. And so a second, more modest, power addition must be made. Now, ideally, the aircraft is maintaining perhaps 700ft per minute and so should be appropriately powered to maintain the glideslope.

This multiple stage throttle movement is called a "three part power correction" in naval aviation. In a more practical way of thinking, a carrier aviator controls his power (and thus rate of descent) in the carrier approach by utilizing a near continuous set of discrete three part power corrections each adding to or subtracting from the energy state of the jet. These corrections are generally represented by the following mnemonic:

When low: *"A little on. A little off. And half back on"*
When high: *"A little off. A little on. And half back off*"

In actuality, this technique is as valid in a Cessna as it is in a F-14. However, rather putting in a power corrections and waiting for something to happen, carrier aviators distill this correction down to a discrete "shot" of power. This is done to avoid over controlling the power and inducing oscillations in the carrier approach, particularly on the ball where the glidelslope is incredible sensitive.

How much is a little? That is entirely subjective (and very dependent in FSX on your HOTAS setup), but consider about a half inch of throttle travel to be a good starting point. Most carrier aviators will also use a reference point somewhere on the throttle quadrant as an anchor, placing their wrist, little finger, etc on some portion of the cockpit that doesn't move to give them a feel for the corrections that they are making.

Remember, these power corrections are meant to be short in duration. You don't wait to see the effect of the correction before you remove it. Rather, you simply determine that a correction must be made, make it, then scan your instruments (and when appropriate the ball) to determine if and when another correction must be made. In practice, this results in the carrier aviator making almost continuous small corrections of a frequency that would bewilder most conventional pilots.

One last point on power corrections. There may be times, when a large correction to your energy state must be made. In these cases, it is entirely permissible to reduce your throttle as low as idle or advance it as high as mil (or rarely AB)….*providing you don't leave it there!* Due to the fact that jet engines, unlike automobile engines, must spool up or down to change thrust; retarding your throttle to idle once for five seconds will net you a far greater loss of energy than reducing the throttle to idle five times for one second each. This particular action, (i.e. reducing your throttle to idle and leaving it there) is referred to as "being back in the bucket", and the 3 to 5 seconds that it takes for the engines to spool back up to mid range may well be the longest (and if you are particularly unfortunate, the last) of your life if you do it 300ft above the waves.

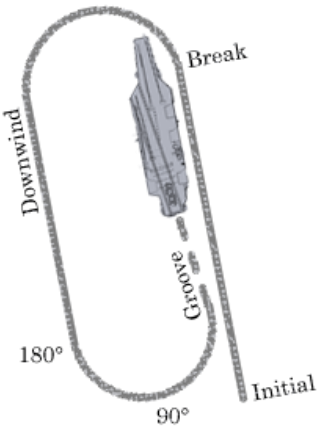
VFR APPROACH

The key to the daytime VFR carrier landing pattern, as with most things in aviation, is consistency. Inconsistent pattern control will essentially mean reinventing the wheel every pass whereas a consistent pattern will allow you to make measured and reasonable corrections.

There are two ways to enter the carrier landing pattern; from the break and from the upwind leg.

ENTERING VIA BREAK

The F-14 carrier break is commenced by flying up the starboard (right) side of the carrier at 800ft and 300-350kts. Begin by selecting the hook down if you intend to trap on the first pass. Make note of your heading; it is the carrier's Base Recovery Course (BRC) and knowing it will be critical to your success. All pattern checkpoints are referenced to the BRC (or its reciprocal, quickly calculated as BRC + 200 - 20). This is despite the fact that the landing area is canted off the BRC by approximately 10 degrees.



Customarily, the break is executed at least 1NM past the bow (but no more than 4NM) by rolling into a 45-60 degree Angle of Bank (AOB) turn, bringing the throttles to idle, and extending the speedbrakes.

It is very important that the carrier break be made LEVEL, so keep your instrument scan going. At this point you are only 800ft above the water and more than one naval aviator has ended an otherwise promising career by slicing his aircraft straight into the sea. Select gear and flaps down at 280 and 225kts respectively. Continue to slow to on-speed Angle of Attack (AOA). Once level and on the reciprocal heading of the BRC (you did remember it right?) descend to the carrier pattern altitude of 600ft. Complete the landing checklist and slow to on speed AOA.

- *A last word on the break. There is often the temptation to break directly over the ship at the speed of heat in what some might consider a Sierra Hotel (Shit Hot!) fashion. If you find yourself so tempted, remember the old LSO admonition…"Don't be John Wayne in the break, if you are going to be Jerry Lewis on the ball!"*

ENTERING VIA UPWIND

More prosaically, the carrier pattern may simply be entered from the upwind leg. This will be the common entry when conducting landing practice or after a wave off or bolter.

The turn to downwind is executed after climbing to at least 300ft. The ship will be advancing behind you, so hurrying to the downwind only reduces the time available to prepare the aircraft for the next pass. If you were shot off the angled deck, waved off, or boltered, it will be necessary to turn right to parallel the ship's BRC before the turn downwind. Should this be necessary, do not make this correction until past the ship's bow. Under no circumstances cross the bow (unless you particularly like the sound of the Air Boss's voice yelling at you).

CARRIER PATTERN

THE CROSSWIND TURN

Conduct the crosswind turn at 30 degrees AOB to roll out on the reciprocal heading to the ship's BRC. In general, the ship will turn so that the wind is blowing down the deck (or nearly so). However, any number of factors may result in a slight crosswind, including whether the ship is using the prevailing winds or is forced to make the wind itself by steaming ahead. If the wind is not coming from the direction of the ship's BRC, be prepared to use a small crab angle to maintain the proper abeam distance (1.0-1.2NM) or as necessary to correct for repeated overshooting or undershooting approaches (assuming of course that it's the wind and not the pilot causing the over/undershoots). Again, complete the landing checklist and slow to on-speed AOA.

THE ABEAM/180 POSITION

The abeam position and the 180 position are co-located in the carrier pattern. This is because the carrier is moving away from the aircraft and thus is creating the straightaway that the pilot would need to generate himself at the field. Please note that the figure above does not reflect this as the ship will have moved between the time the aircraft approaches the abeam point and the time the aircraft touches down.

Plan to arrive at the abeam position fully configured, landing checklist complete, and trimmed on speed 1.0 to 1.2NM abeam the aircraft carrier, 600ft and on the reciprocal heading of the BRC. Commence the approach turn when the white paint of the rounddown is visible (assuming the carrier is moving). The first part of the approach turn is conducted at 27-30 degrees AOB and 200-300 ft per minute. Keep in mind that this is a very small rate of descent and that the aircraft will already be sacrificing some lift as it enters the turn. As such, little to no power reduction may be necessary to generate the desired rate of descent. In some cases, a slight power addition may actually be required.

- *Between the 180 and the 90, there is actually very little to look at outside the aircraft. Keep your primary focus on arriving at the 90 on speed at 450ft.*

- *Any delays off the abeam will generally result in being long in the groove and low if the proper pattern numbers are flown.*

- *Keep in mind that the carriers in FSX are not always in motion, unlike an actual aircraft carrier. If this is the case, the pilot will need to time approximately 15-18 seconds off the abeam in order to generate proper groove length on final.*

THE 90 POSITION

On arrival, the aircraft should be at 450ft, on speed, and 90 degrees to the ship's BRC. At this point, increase the aircraft's rate of descent to 500ft per minute and maintain the turn. If the initial descent was made with the assumption of a moving carrier, the pilot may feel close and high. This is an illusion. The carrier will continue to move away as the approach is continued. Resist the temptation to ease the turn or increase the rate of descent greater than 500ft per minute.

At this point, scan should transition from a primarily instrument scan to an inside/outside scan. Small changes of AOB should be utilized to correct for overshooting or undershooting conditions. Do not use greater than 30 degrees AOB. As the landing area is angled off the ship's centerline, aim to overshoot the ship's wake just slightly in order to roll out on the centerline of the landing area.

THE 45 POSITION

On arrival, the aircraft should be at approximately 325-375ft, on speed, and in a 500ft per minute rate of descent. The ball should begin to appear on the lens, but do not use it for glideslope information until rolling into the groove. Continue to adjust AOB to roll out on the centerline of the landing area.

- *Never descend below 300ft without a ball in sight*

THE GROOVE

Ideally the aircraft should roll out in the groove at 3/4 mile (15-18 seconds of groove length), a centered ball, on speed, at approximately 500ft per minute rate of descent. *This is the most important part of the approach turn and, if the aircraft did not wind up in these parameters, it is most likely due to a poor pattern or poor abeam position*. For example, a proper pattern, commenced too late off the abeam would place the aircraft too long in the groove and thus low at the start, necessitating a flat approach turn to acquire the ball followed by a correction to reacquire the proper rate of descent.

- *If the aircraft can enter the groove on speed with a steady ball and stabilized, the difficulty of flying the subsequent approach to the ship is dramatically reduced.*
- *As the aircraft rolls wings level, the additional lift provided by the wings being perpendicular to the force of gravity once again may necessitate a timely power reduction to prevent getting fast. Anticipate this reduction, be aggressive, but do not overcontrol the power.*

As you roll out at three quarters of a mile, the Radar Intercept Officer (RIO) will call the ball: "*Callsign*", *Tomcat Ball, "Fuel State".* If he (and presumably the pilot) does not have the ball in sight, the RIO will call "CLARA" instead. At this point, the Landing Signal Officer (LSO) may state where the aircraft is in relation to the ball and tell the crew to continue, or he may wave the aircraft off.

- *Keep in mind that the ship's landing area is angled approximately ten degrees off the centerline of the ship. Attempt to put the extended centerline of the angled deck right between your knees and keep it there with a series of small wing dips to maintain alignment.*

- *Correcting lineup deviations early in the approach should be the goal. Get on centerline and work to stay there. If poor lineup is not addressed early, it will illicit LSO intervention, take your attention away from glideslope maintenance, and induce lift, AOA and power variables into the overall equation that make the already challenging task of landing on the ship that much more difficult.*

MEATBALL, LINEUP, ANGLE OF ATTACK

Once the aircraft is wings level, begin flying the ball. It is generally less effective to fixate on the ball than it is to include it in a scan which includes the aircraft's lineup and the AOA Indexer. Every carrier aviator knows the mantra: "Meatball, Lineup, Angle of Attack. Meatball, Lineup, Angle of Attack."

And many repeat it to themselves as they fly down the chute.

These three instruments should be scanned continually and any deviations should be aggressively addressed with three part power corrections. It is here that the pilot's left hand is almost constantly moving and if your hand is unoccupied for overlong, you are almost certainly doing something wrong.

Here are a few simple guidelines to flying the ball:

- Never accept (or "milk") a low ball. Even on a perfect approach to a steady deck, the aircraft hook will only clear the deck by several feet. Accepting a low gives you no place to go but down. Address a low ball immediately.
- Make small but definite corrections. Work a high ball down in a series of rapid steps rather than sucking the power to idle and trying to "catch" the centered ball.
- Scan across the green datums. It is easier to see the ball this way than by just staring at it.
- When centered, work for a "cresting ball". Due to the narrowing of the ball as you approach the ramp, a centered ball may not remain centered. If you have the ball centered, make tiny positive power corrections to make it just crest above the green datum lights. This prevents the ball from insidiously "sagging" low as you get closer to the boat, necessitating what will probably be an over correction in close.
- Never correct a high ball in close. Anecdotally, more ramp strikes are committed by pilots that are high in close and overcorrect than by pilots that are a little low. This makes a powerful argument for correcting a high early. If you do find your ball the climbing in close, correct to freeze it in place rather than attempting to recenter it.
- Moreover, trying to recenter a ball in close may result in the dreaded "Ease guns to land" call, also known as "going idle in the spaghetti". As you will shortly learn, there is never a guarantee that you will catch a wire on even the best approach, and you do not count on it. As soon as the aircraft touches down, the pilot must immediately go to mil power to ensure that he doesn't dribble off the deck and into the drink. If your power is at idle, particularly if it has been for some time, there is a very real chance of taking an unscheduled swim.
- Always take your waveoff or bolter like a man (or woman as the case may be). As the saying goes, "Some days, you get the bear and some days, the bear gets you". If it's your day behind the eight ball, don't make it worse by trying to salvage the unsalvageable approach and winding up in the spud locker. (naval aviation slang for becoming a dark red smear on the carrier's fantail)

TOUCHDOWN

There is no flare in the carrier approach as there is in non-carrier aircraft. Continue to scan meatball, lineup, and angle of attack constantly as the approach progresses. This is very important, as failure to do so will often result in "spotting the deck" (i.e. attempting to land visually as though you were on land) which in turn usually results in a fly through of the glideslope or a bolter. *The touchdown should come as a surprise and you should be able to recall where the ball was as you hit the deck*. In practice, not looking at the deck as you are about to strike it is fairly unnatural and will require some practice to get used to.

TRAP OR BOLTER

As soon as the aircraft touches the deck, smartly advance the throttle to MIL/AB and retract the speedbrakes. There is functionally no way to know on touchdown whether the aircraft has successfully trapped and very little time/distance to maintain/regain flying speed. Do not retard the throttle until the aircraft has come to a stop.

Also remember that the HUD is not the primary landing instrument in the F-14. It's incredibly tempting to fly the approach with the velocity vector. Avoid this temptation. It encourages spotting the deck…the LSO can always tell.

If the aircraft has boltered, fly it off the deck edge, set a positive climb attitude and perform the crosswind turn to re-enter downwind or depart the pattern as appropriate.

WAVE OFF

Wave offs are mandatory. In the event of a wave off, advance the power to mil, retract the speedbrake, and maintain optimum AOA. Care should be taken for wave offs in close as any tendency to rotate the nose may lower the hook resulting in an in flight engagement.

LANDING SIGNAL OFFICER (LSO)

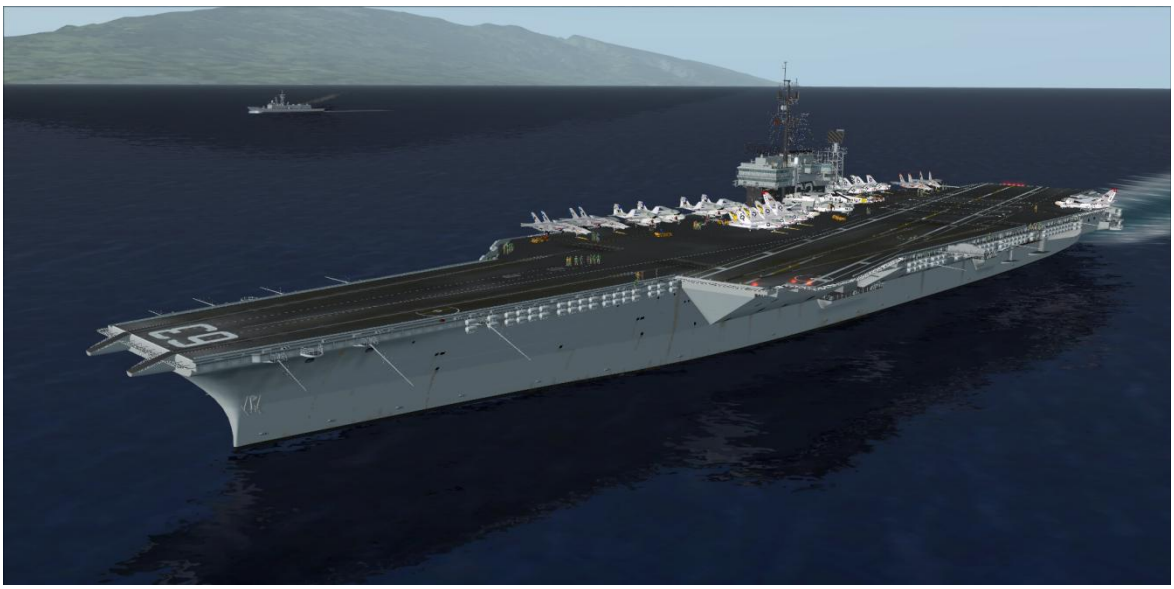
Every carrier landing is observed, graded and debriefed to the pilot by LSOs. LSOs are pilots from squadrons aboard the carrier with additional training and qualifications to observe and evaluate the carrier landings of their fellow carrier aviators. They are generally formed into teams of 3-4 individuals, with varied backgrounds on each team. For example, an LSO team may have an F-14 Tomcat pilot as team lead, with an E-2 Hawkeye pilot, an EA-6B Prowler pilot and an F/A-18 Hornet pilot as additional team members. In this manner, a wide range of experience and expertise on each LSO team is guaranteed.

For each carrier landing, an LSO is observing the approaching aircraft's glideslpoe (the "Controlling LSO") while a second LSO ("Backup LSO") is observing lineup. Each LSO has a "pickle switch" to control the waveoff lights mounted next to the meatball, and also has a radio handset to answer the ball call and communicate with the pilot, when necessary, during the pass. Once the pass has been flown (to a trap, a waveoff, or a bolter), the Controlling LSO evaluates the pass and assigns a grade. The comments are recorded in a notebook (usually by a junior LSO, or an LSO under training) so the pilot's performance can be debriefed and his/her landing trends and tendencies can be tracked over time. The grading of each and every approach to the ship builds competition and camaraderie, and fosters a mindset of continuous improvement amongst the pilots.

Grading is as follows:

- **WO** = Waveoff. Pass was waved off for poor pilot technique.
- **B** = Bolter. Tailhook did not engage an arresting wire, either due to poor pilot technique or happenstance.
- **OK** = OK Underline. The perfect pass. Almost never happens, and when it does it's usually due to the pilot performing well during inclement weather or in dealing with an aircraft emergency during the approach.
- **OK** = OK Pass. Reasonable deviations with good corrections, i.e., usually no more than ½ ball deviations combined with timely and appropriate corrections by the pilot.
- **(OK)** = Fair Pass. Reasonable deviations, i.e., one ball high or low, corrections come late and/or are insufficient, maybe requiring LSO verbal intervention.
- **---** = No Grade (or "Stitch"). Below average pass, but safe. Typical example is a pass flown ½ a ball to a ball high, then overcorrecting in close with a big power reduction which results in a large rate of descent at the ramp and a trap into the 1 wire. At night this is known as a "Sparkler One Arrival" due to the hook dragging along the deck and kicking up lots of sparks while it approaches, and eventually engages, the first arresting wire. Not good.
- **C** = Cut Pass. Unsafe pass, usually due to gross deviations inside the waveoff window. Probably should have died, but didn't.

USS KITTY HAWK (CV-63)



The USS Kitty Hawk was laid down in December 27th, 1956 and launched May 21, 1960. Commissioned on April 29th, 1961 she was designated CVA-63 and became the flagship of her class that included three supercarriers. The Kitty Hawk circumnavigated the global on her first deployment, and then performed 8 Western Pacific (WESTPAC) deployments over the next twelve years. Books could be written her endeavors and accomplishments of this era.

On April 29th, 1973, the Kitty Hawk arrived in San Francisco for a major upgrade. New jet blast deflectors were installed to enable launch and recovery of F-14's, and the carrier designation changed to CV-63. The "A" (Attack) was dropped to signify multi-mission capability. The first F-14's arrived for WESTPAC deployment in 1977 with VF-114 and VF-213. After 17 tours with A model F-14's, VF-154 was the last squadron on the Kitty Hawk in 2003. Some of the most significant event locations and destinations are described in the following pages as the basis for the carrier tracks in FSX.

After 37 years of calling San Diego home, on August 11th, 1998 the Kitty Hawk moved to a new home port of Yokosuka, Japan and became the third permanently forward deployed carrier in the Navy's history. In November of 1998 she became the oldest ship in the fleet and flew the First Navy Jack until being decommissioned in 2009 after 49 years of service. She currently rests in Puget Sound Naval Shipyard.

FLOLS (COTINUED)

CV-63 has a custom implemented FLOLS system that is compatible with any aircraft, but a gauge must first be installed prior to use. It is a simple line addition to an aircraft's panel.cfg:

IN PANEL.CFG

```
[Vcockpit01]
.
.
gaugeXX =..\..\..\..\Aerosoft\F-14A\FLOLS\CV63_FLOLS!FLOLS_CV63
```

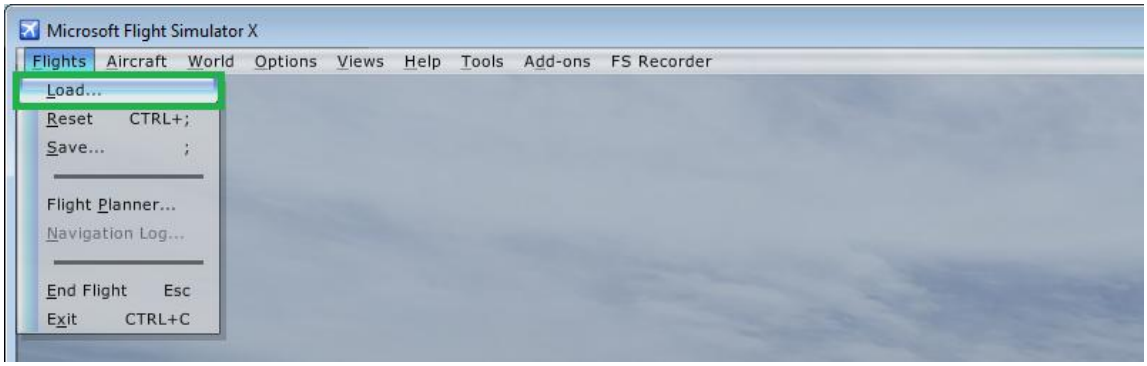
**Where XX is the next available gauge number*

CARRIER ROUTES IN FSX

11 routes for the CV-63 carrier group have been added to flight simulator. Each route is approximately 300nm long and runs over 24hr clock (12 hours out and 12 hours return). For each route there is a saved flight that allows users to start on the deck of a moving carrier. To load a flight, simply go to the Free Flight menu, select the flight and condition of your choice and press **Fly Now!**

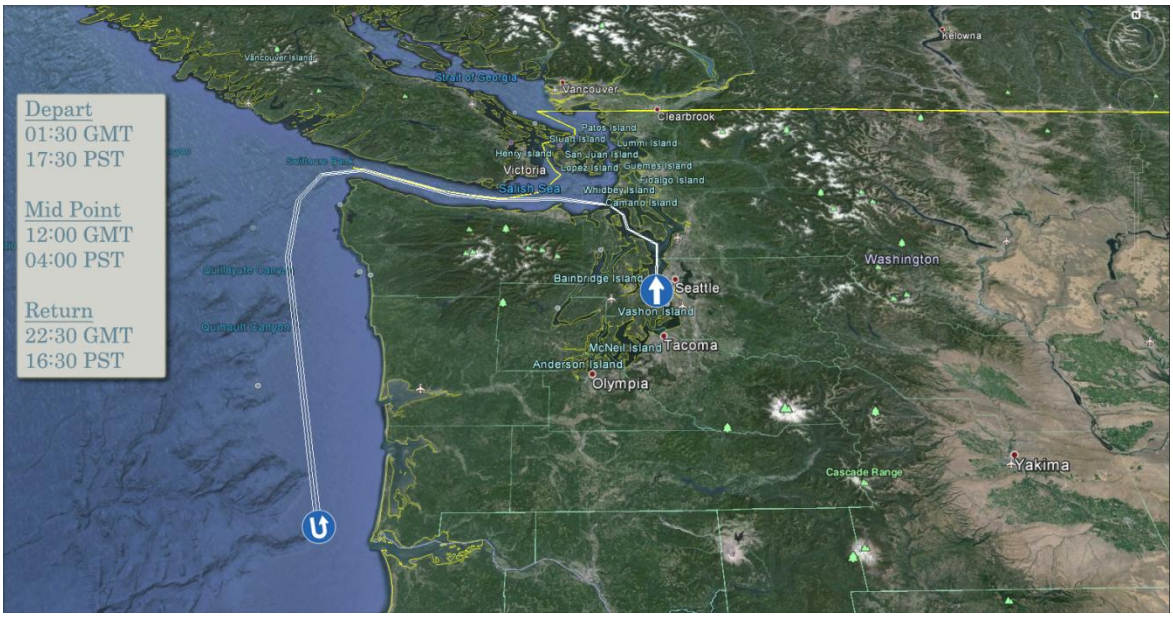
Saved carrier flights break some normal FSX conventions, it is strongly recommended that if you have any anomalies on the loading the flight (unusual payload for example), that you ensure that the default flight with the Aircreation Ultralight is installed.

If something goes wrong with the flight, and you are forced to reload; beta testing has shown better results by completely reloading the flight. E.g. Menu->Flights->(Select Flight) opposed to resetting the flight.



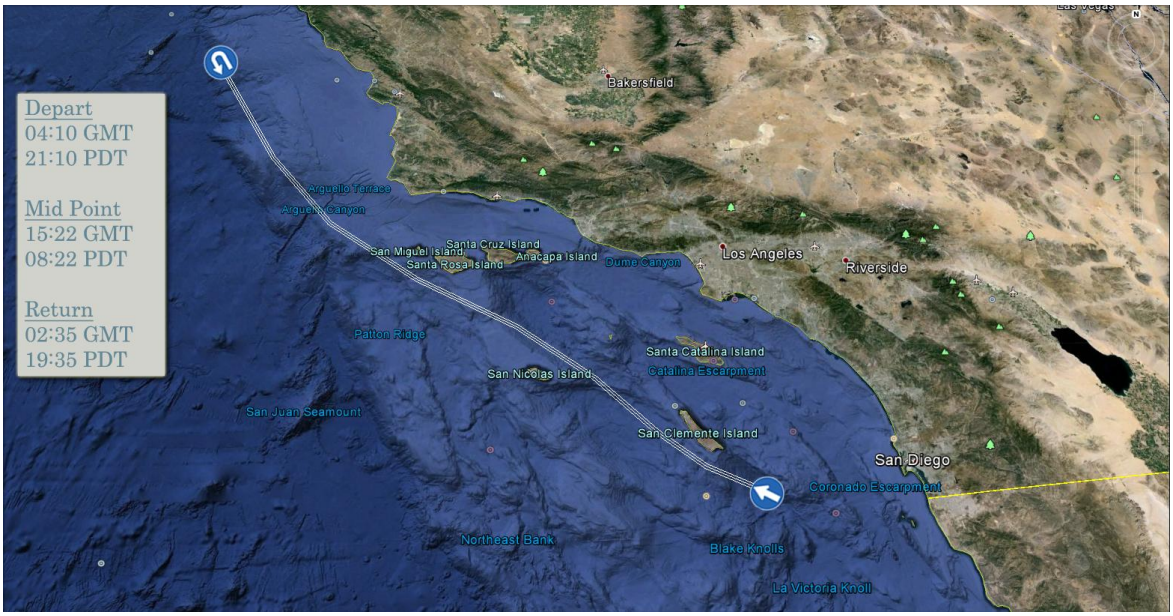
PACIFIC NORTHWEST

The Kitty Hawk's official home port was Puget Sound Naval Shipyard in Bremerton from first commission until 1998. However, the Kitty Hawk rarely visited home and was frequently deployed out of San Diego, CA. An import site for upgrades, major overhauls were started in 1964, 1976, and 1982.



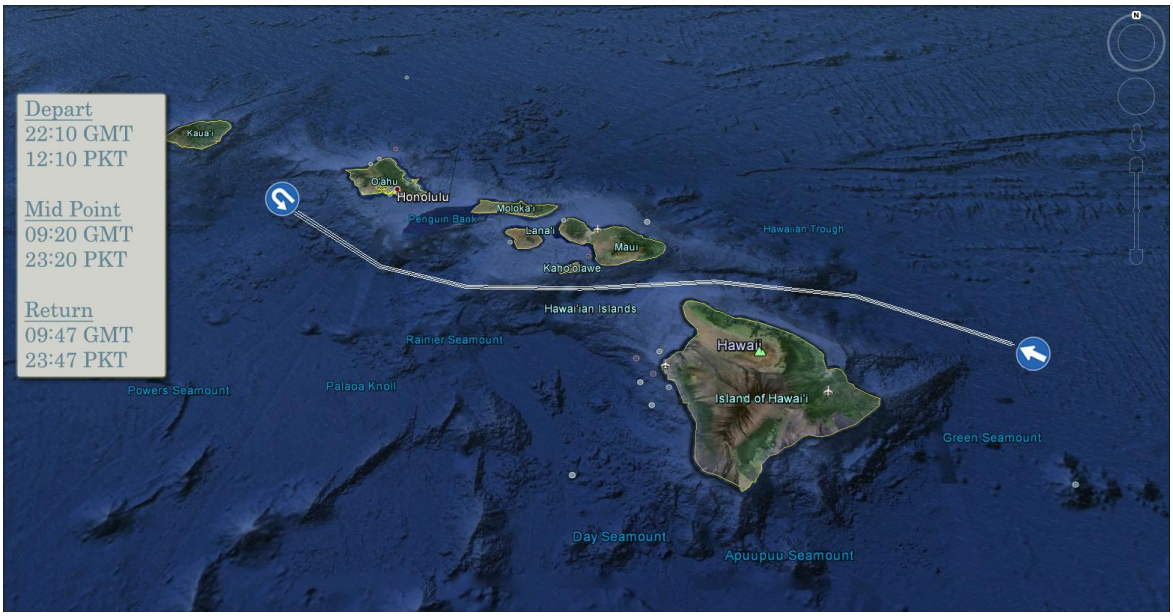
SOUTHERN CALIFORNIA

While not her official homeport, Naval Base San Diego was the Kitty Hawk's primary port of deployment until 1998. Aside from routine naval exercises, the Kitty Hawk served as a rescue vessel for three passengers on a ship that was sinking just south of San Clemente Island.



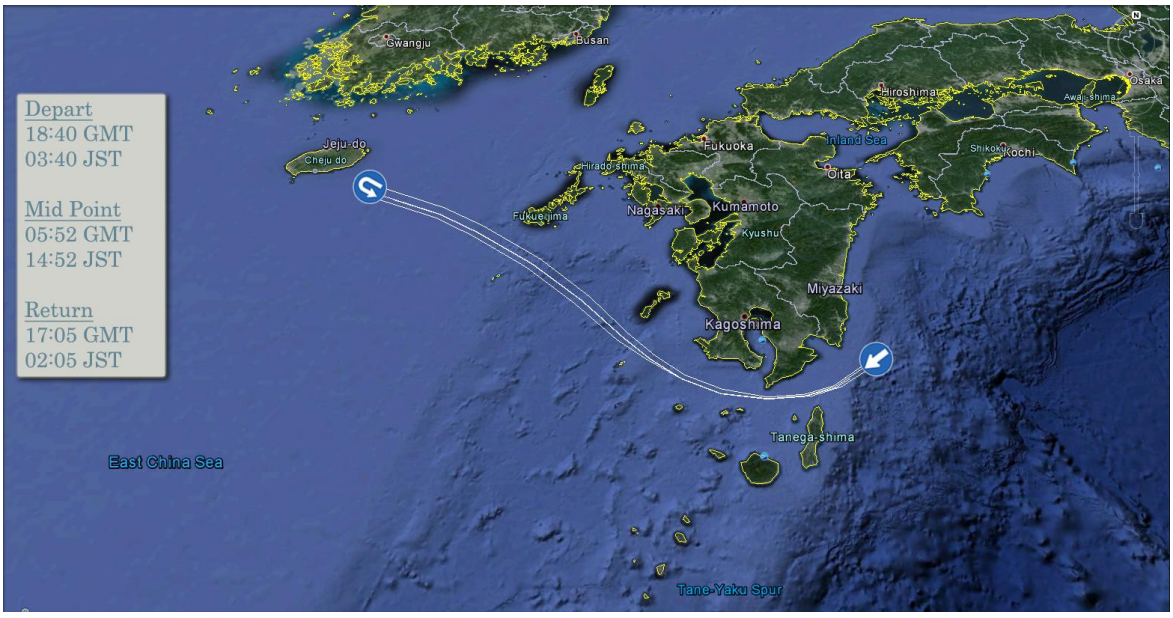
ISLANDS OF HAWAII

The hub for all Western Pacific Operations, the Kitty Hawk would have passed through Hawaii on nearly every tour.



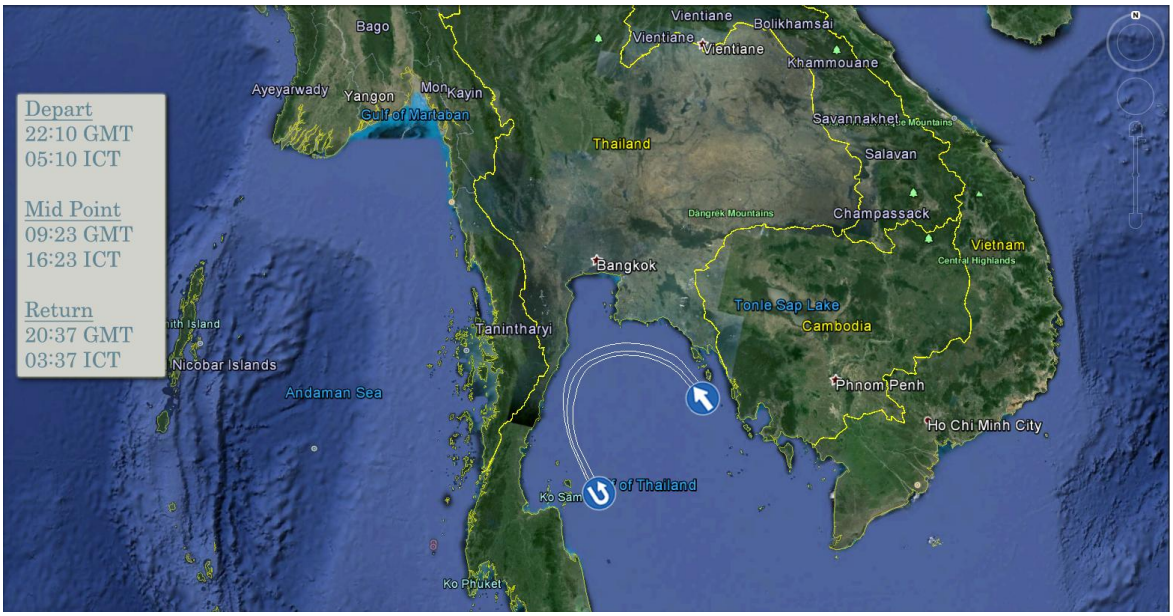
EAST CHINA SEA

In August 1998, the Kitty Hawk arrived at her new home port of Yokosuka assumed the USS Independence's role as the Navy's forward deployed carrier. In November, she was awarded the First Navy Jack as the longest active serving ship in the fleet.



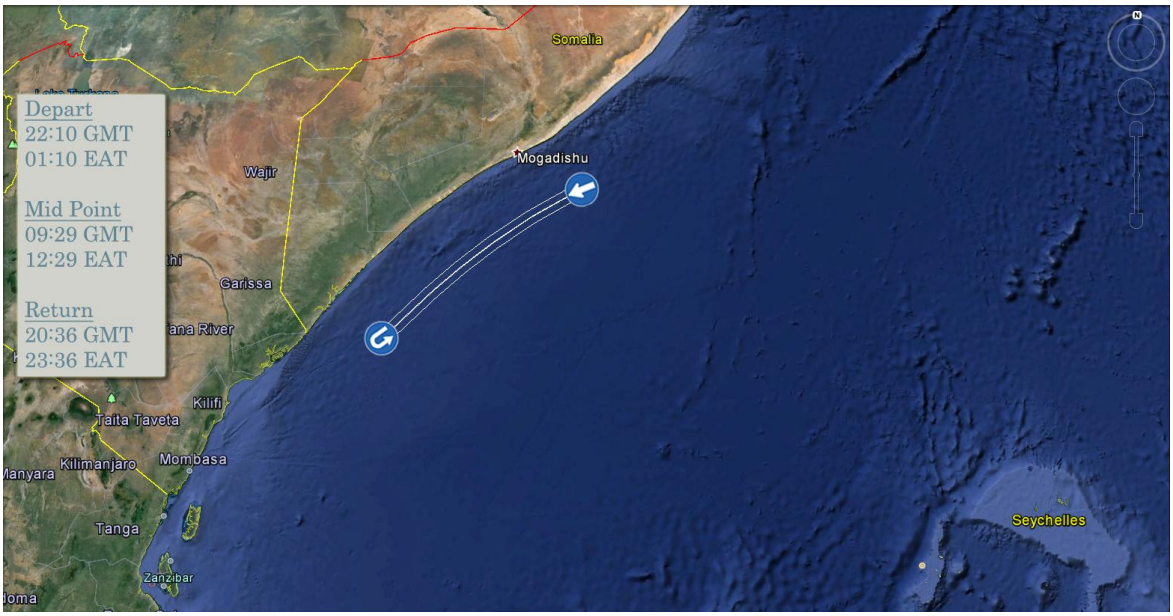
GULF OF THAILAND

In 1979 the Kitty Hawk coordinated rescue efforts for 114 refugees fleeing Indochina. In 2000, the Kitty Hawk participated in Exercise Cobra Gold with the Royal Thai Air Force, where her aircraft acted as aggressors in air-to-air and low level bombing missions.



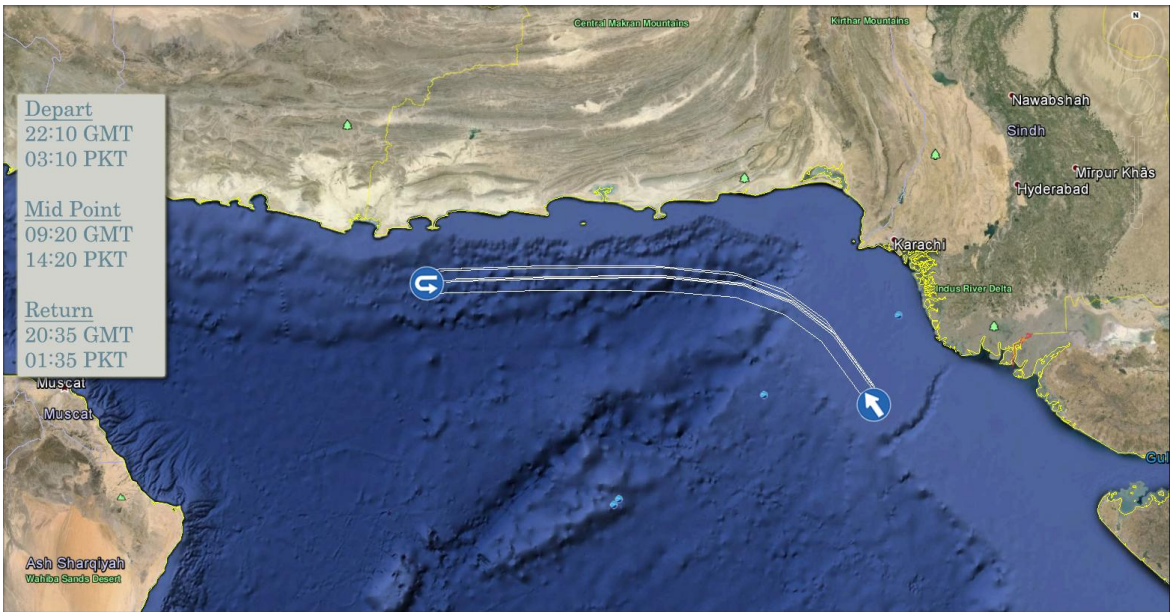
SOMALIAN COAST

During Operation Restore Hope in 1992, Kitty Hawk's aircraft flew 446 missions in 8 days as warlords attempted to seize relief supplies to famine victims.



ARABIAN GULF

The Arabian Gulf has been the site of some of the most significant naval events in the last 40 years. The Kitty Hawk was on station as flagship during the Iranian Hostage Crisis of 1980; enforced the Iraqi 'No-Fly' Zone after Iraqi violations in 1992, 1999, & 2001; and as a forward operating platform for Special Forces during Operation Enduring Freedom, SEP-OCT 2001.

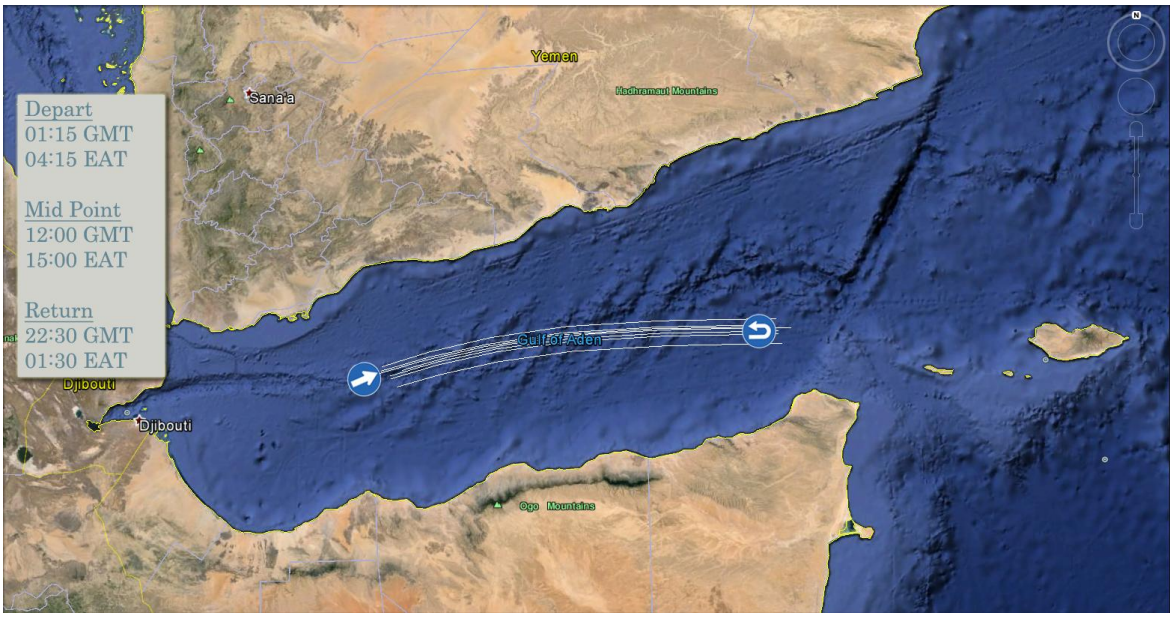


PERSIAN GULF

The Kitty Hawk patrolled the Persian Gulf on surveillance during the Iran-Iraq War in 1985 and 1987, coming to the assistance of the USS Stark after an attack that killed 37 sailors.

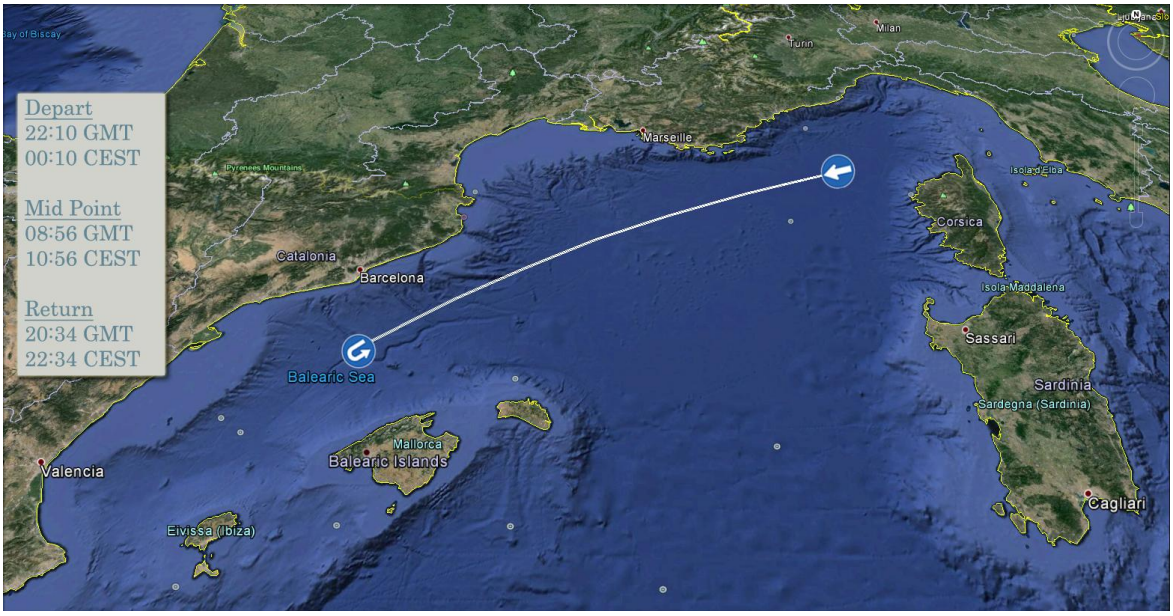
GULF OF ADEN

The USS Kitty Hawk made routine trips to the Gulf of Aden. Most notable was the 'Hallmark' cruise of 1985. Serving as the flagship of Battle Group Bravo, the Kitty Hawk completed consecutive cruises with no casualties, no accidents during launch & recovery, and 100% availability of all cats & wires. The city of Aden, South Yemen also served as a base from which Soviet Il-22, Il-38, and Tu-95 aircraft would make runs to test the Kitty Hawk's defensive perimeter. F-14's from CVW-15 frequently handled these intercepts.



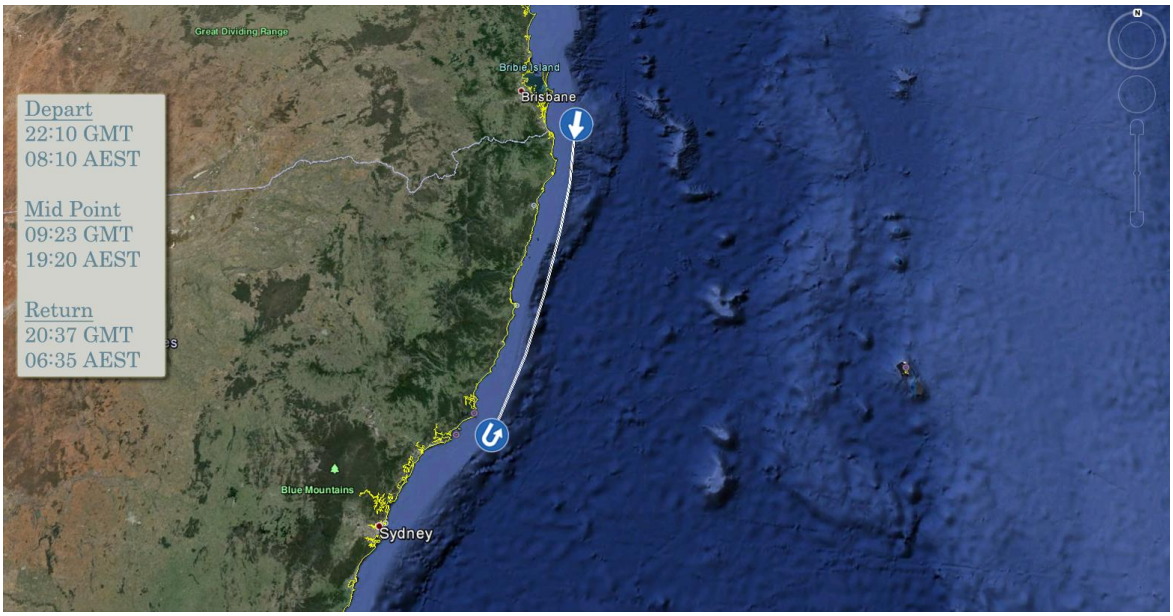
MEDITERRANEAN SEA

As a Western-Pacific (WESTPAC) ship, the Kitty Hawk was not a frequent visitor to the Mediterranean or Atlantic. However, she would have passed through during circumnavigation of the globe in 1987, departing San Diego and arriving at Philadelphia Naval Ship yard.

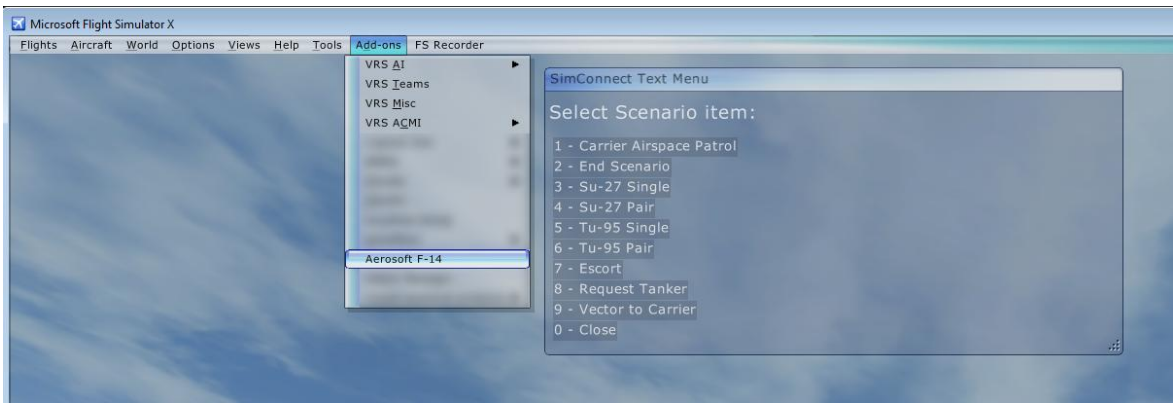


NEW SOUTH WALES

During her farewell tour of Pacific operations, the Kitty Hawk sailed from Brisbane to Sydney in July of 2007. In the same tour, she participated in a combined land, sea, and air exercises with 12,000 Australian and 20,000 American personnel in Talisman Shield.



CARRIER AIRSPACE



In an effort to provide a more immersive military and naval environment, we have included a set of AI aircraft that can be called on demand at any time and anywhere in the world where there is an aircraft carrier.

There are two hugely important considerations to make this script work.

(1) You must be tuned to a carrier's TACAN frequency
(2) At some point, you must have been within 50nm of the carrier while tuned to the TACAN frequency. This is based on a limitation that FSX only sees ships 50nm or closer.

If you use any of the presaved flights, both of the above criteria will be met as soon as you load the sim. However, if you start from land and fly out to the Kitty, or use AI carrier to spawn a carrier you'll have to make sure the two conditions are met.

VECTOR TO CARRIER

If you spend enough time flying in the naval environment, sooner or later you'll wind up asking "where the hell am I and where is the damn carrier?!". In Flight Simulator X, there can be two sources of this issue. First, as mentioned above, the TACAN system can only see out 50nm miles, so if you get caught up trying to catch the perfect shot of the Flanker or Bear pilot that you're escorting out of your carrier's airspace. The solution to this is relatively simple, since the AI Menu provides bearing and distance to the carrier.

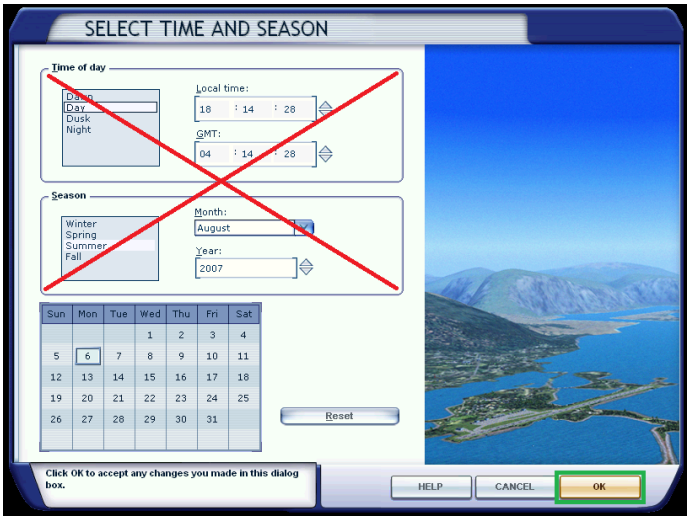
More alarming is the instance when you fly back to the carrier, only to find it isn't there! When you fly outside of the TACAN range for an extended period of time, FSX will remove the carrier group from the displayed group of shipping traffic. The solution to this is a three step process:

1) Use the AI Menu to direct you within 30nm of the carrier.
2) Go to the FSX Menu-> World->Time and Season and then simply hit "OK", do not change the settings
3) FSX will reload the local shipping traffic automatically and the carrier group will return

In pictures:

(1) The AI Menu gives you a carrier bearing 347 at 0 miles; you're right on top of the carrier group but it's nowhere to be seen.

(2) Go to the FSX menu and select World->Time and Season. Press "OK" without making any changes.



(3) The carrier regroup has been spawned back into the sim environment.

SCENARIOS

Four general scenarios are available from the AI Menu:

(A) Carrier Airspace Patrol
(B) Intercept
(C) Escort
(D) Refuel

Carrier Airspace Patrol is a randomized interaction that creates advanced combinations of Intercept & Escort and adds a scenario of a lost civilian pilot.

Intercept is a randomized interaction that generates a either a fighter flight (Su-27) or a bomber flight (Tu-95) in a single or two ship formation with a combat split. The flight will attempt to penetrate the carrier airspace and overfly the carrier as a show of capability. It's your job to apply timely and effective measures to prevent the fly over.

It is important to note that weapons we fired only in the rarest of circumstances (Gulf of Sidra 1981 and 1989) while the majority of encounters were non violent displays of aerial prowess. A relatively recent event illustrates the restraint displayed by ships in the carrier battle groups to prevent escalation even during successful fly overs.

http://abcnews.go.com/International/story?id=81971

Escort is a randomized interaction that generates one of three aircraft that will request safe transit across the carrier's airspace. Every once in a while, an Su-27 will make an appearance to investigate.

Refuel: A tanker will spawn several miles in front of your ship and turn to fly directly into the wind to minimize the influence of gusts during the delicate procedure.

Spawn times
There are two different spawn behaviors to accommodate the desired normal flight time. If you are sitting on a carrier deck and call (A), (B), or (C), the program will simulate a ready-alert state and AI aircraft will be spawned within 60 seconds of the request and be within 50nm of the carrier. If you are airborne when a scenario request is made, then program will simulate a combat air patrol and the AI aircraft will begin to spawn 10-30 minutes after the request has been made and spawn as far as 150nm from the carrier.

If a request for a refueling tanker is made, it will spawn immediately whether you are in the air and or on the ground, and then automatically be removed when separated by more than 15nm.

Limitations
In the current implementation, AI aircraft are guided by the stock FSX autopilot. This imposes a 25 degree maximum bank angle and a maximum vertical speed of ±6,000ft/min. Aircraft will respond intelligently, but do not expect realistic combat maneuvers.

AI TACTICS

INTERCEPTS

Each AI aircraft has a randomly generated personality and level of aggression. Specific tactics will need to be applied for each airframe, and the AI's personality dictates at what point the pilot becomes intimidated and returns home. The tactics employed have been developed with advice of a veteran F-14 driver.

Sukhoi Su-27

Flankers will use speed to their advantage. Dense air at Sea Level is associated with a relatively low maximum Mach. If you fall behind, they will be difficult to catch. For non-TacPack users, Flankers will disengage with either a Single Target Track or a GUNS solution. For TacPack users, Flankers will only disengage with a valid firing solution of either GUNS or a flashing SHOOT. For all users, the aggression level of the AI will determine how close you must be and how long you must hold the firing solution.

Tupolev Tu-95

Bear pilot's are more difficult to intimidate. Escorting fighters will frequently RTB first because their aggressive maneuvers are too easily misinterpreted and their ultimately peaceful missions were not worth the loss of machine and life. Bear pilot do not have such concerns and most will not respond to a missile or guns solution, at least at first. Close quarter, high speed passes (think M1.6) or running forward thatch weaves to disrupt airflow will do the trick.

Wandering Pilots

These will come in all sizes, but have one thing in common, they are oblivious to their position and not responsive to radio inquires. Fly parallel to the pilot and say hello face to face.

ESCORTS

Escorts will be one of three different aircraft. They will be on a straight course that does not intersect the carrier.

Tankers

Once aligned with the prevailing wind direction, Tankers will fly straight until you are finished taking on fuel. Airspeed is constant at 240 KIAS, the optimum airspeed for refueling the F-14.

AI SUBSTITUTIONS

It is possible to swap out any of the AI aircraft for another aircraft of your choosing. The procedure to do so is almost identical to swapping out the default tow plane, and an example is shown below.

Swap Su-27 for F-16 Aggressor
1) Go into the Su-27's directory at ***SimObjects/Aiplanes/Sukhoi Su27 AI***
2) Open the **aircraft.cfg** and change the **title** to read

[fltsim.0]
title=Sukhoi SU27 Red 01 AI SWAPPED

3) Now go into F-16's directory at ***SimObjects/Aiplanes/F-16A 9***
4) Open the **aircraft.**cfg and create a copy of the desired **[fltsim.X]**
5) Change the **title** and **atc_id** to read

[fltsim.X]
title=Sukhoi SU27 Red 01 AI
.
.
atc_id=SU27R01AI

The F-16 Aggressor will now be called as the first fighter intercept instead of the Su-27. The directories, title and atc_id of all the AI aircraft in the F-14 package are listed below.

[Fighter]
Simobjects/Airplanes/Sukhoi Su27 AI
title = Sukhoi SU27 Red 01 AI
atc_id = SU27R01AI

title = Sukhoi SU27 Blue 03 AI
atc_id = SU27B03AI

[Bomber]
Simobjects/Airplanes/Tupolev Tu95 AI
title = Samdim Design Tu95MS AI
atc_id = TU9501AI

title = Samdim Design Tu142M AI
atc_id = TU14201AI

[Escort]
Simobjects/Airplanes/Aerosoft_F14_b747_400_AI
title = Boeing Air Force One F14AI
atc_id = F14ES01AI

Simobjects/Airplanes/Aerosoft_F14_737_AI
title = Boeing P-8 F14AI
atc_id = F14ES02AI

Simobjects/Airplanes/Aerosoft_F14_Lear45_AI
title = Learjet 45 USAFE F14AI
atc_id = F14ES03AI

[Wandering Pilot]
Simobjects/Airplanes/Aerosoft_F14_DHC2_AI
title = DeHavilland Beaver DHC2 F14AI
atc_id = F14AI01A

Simobjects/Airplanes/Aerosoft_F14_DHC6_AI
title = de Havilland Canadian Twin Otter WCA F14AI
atc_id = F14AI02A

title = de Havilland Canadian Twin Otter CAF F14AI
atc_id = F14AI02A

Simobjects/Airplanes/Aerosoft_F14_C208B_AI
title = Cessna Grand Caravan F14AI
atc_id = F14AI02A

Simobjects/Airplanes/Aerosoft_F14_B350_AI
title = Beech King Air 350 F14AI
atc_id = F14AI03A

Simobjects/Airplanes/Aerosoft_F14_A321_AI
title = Airbus A321 F14AI
atc_id = F14AI04A