F14 Carrier Landing Tips

by Victory 205 *Rev 2*

There is nothing mysterious about flying an F14 aboard a ship. It is a traditional flying airplane in the pattern and groove, and young Naval Aviators have been doing it that way for generations. Don't be intimidated, getting the Tomcat aboard is quite fun and satisfying.

This will be a real world treatise, it's not an artificial cheat sheet and it's not designed for casual flyers who want to fly unrealistic patterns and speeds. Have fun if that is your thing, but don't bother to read any further. If you are interested in what it takes to *"master the art of flight from the deck of a ship at sea"*, then read on. Very few in the history of manned flight have managed to do so.

The guide assumes that you are familiar with the Case I pattern, it's included below. There are plenty of videos out there that show the basic pattern. The serious video creators do an amazing job, but they haven't flown an F14 aboard a ship at sea. With the exception of "Lex", who's Hornet Case I videos are quite useful, none of the videos that I've seen really get into the nuances of getting a good start and flying the ball. Let's see if we can change that.

I am not a fan of video so don't ask. The medium has a place to be sure, but it just isn't practical for sharing detailed information quickly. I am still an active professional pilot who attends training regularly using a variety of techniques, including manuals, Level D simulators, and video. Few of my colleagues prefer video training. This missive will give you a reference that you can use to find quick information to refresh your knowledge on an area of interest. Far better than slogging through a three hour presentation to find the snippet that you need. Besides, you have a valuable, beautifully flying sim at your disposal. Use it.

Overview

This guide can be used to find your way around any VFR landing pattern under any conditions, including in various weapons configurations both at the field and at sea. Apply the concepts, find your numbers and use them to land anywhere.

We will cover Setup, The Break, The Pattern, Flying the Ball, Making Corrections and end with Mindset.

Since we all have a Case I Instant Action Mission on the Caucasus map, we will reference that from time to time, while applying techniques to achieve safe landings anywhere, including at the field.

Flying a jet involves instrument flying skills, you will need these as described. In fact, Naval Aviators got their instrument ratings in the back seat of a TA-4J before they were qualified in the front seat. We did takeoffs from the runway under the hood from the back seat to simulate the night catapult launch and dynamic transition to flight. Instrument flying means learning what power setting and pitch is required to achieve specific performance- Level flight, rate of descent on glideslope, etc.

Some of you only know FBW controls and Fourth Gen HUDS- you are slothful, lazy and complacent. The F14 will teach you to how to actually fly, and with a little training and practice, you can look down your nose at those plebeian FBW cripples and know that you can fly their jet, but they can't begin to fly yours. Every Naval Aviator begins his or her career flying a natural stability aircraft. Embrace it.

I actually prefer analog airspeed and altitude because a glance at a sagging or spinning needle shows rate of change better than a slew of numbers scrolling by rapidly on a HUD. Error is instantly noticeable in your peripheral vision without requiring interpretation.

Start growing a 1980's moustache, it will improve your landing grades by 23.7%.

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Starting Airborne in the Sim

Most quick missions start behind the boat on a run into parallel to the ship's Basic Recovery Course. To get set up in the cockpit, you have a lot to do quickly when you spawn -

First, buy some time by trimming the aircraft so it is level or climbing slightly.

Set 4000 pph on the fuel flow gauges, this will result in 400 KIAS. Note: you many need to move the throttles around a bit to wake up the throttle axis after spawning. Slow down or speed up to 400 KIAS. Sometimes the sim spawns doing 500 knots plus. That's too fast. When you see 400 KIAS, then set the throttles to 4000 pph to sustain the speed.

Setup

Start at the left side of the cockpit and flow clockwise. Ensure the following-

All three SAS Switches - On

Spoiler Brake Switch - Off

HUD Brightness - Reduced/Off or engage the Red Filter. We don't fly off of the HUD.

PDCP - Landing Mode on left side, AWL or TACAN on bottom, and HUD and VDI switches on the right side of the panel both in ICLS.

Turn up the instrument lights on the right console by hovering and clicking your right mouse button.

Set the BRC on the HSD using the course selector knob on the right side if desired for reference. (The published BRC is is 40 degrees, it's really 36 degrees in the IA mission)

Memorize and fly the BRC Heading, then look at the BDHI bottom tick mark to obtain the downwind heading (it's simply the reciprocal of the BRC for you USAF types).

Note your fuel state. Fuel is time.

Now that you have time to focus on your flight path, focus on slowing to 400 KIAS. Adjust fuel flow from the initial 4000 pph gouge if necessary, and manually sweep the wings aft to 68 degrees. This will require nose up trim as the center of aerodynamic pressure moves aft with the wings.

You are now noticing that fuel flow is a big deal, and is used to set power. Welcome to jets.

Why am I flipping all of these switches?

These steps set up the aids and set the data you need to help fly the pattern. This includes lighting to help you see the instruments and setting up the HUD and VDI to display the ICLS needles to help put you on glideslope. It is very difficult to see the ball in DCS due to screen resolution and the fact that there is a shiny radar dome behind the lens on the ship *(please petition DCS to paint it dark grey or black. It wasn't shiny to the eye in real life and masks the position of the illuminated ball)*.

If you can't get the tasks completed due to time pressure, then simply enter the Case I holding pattern over head the ship at 3000 MSL and 250 knots. Leave the wings out for now, slow as you climb to

3000 MSL, and enter a left, 25 degree angle of bank turn with the ship positioned at the nine o'clock position. These parameters result in about a five mile diameter circle.

Set everything up as above at your leisure. When you have your courage up, from the three o'clock position (across the circle from the boat), extend aft of the ship while heading downwind, begin a descent to 800 feet and accelerate to 400 KIAS. Move the wings aft to 68 degrees as you accelerate through 300 KIAS. The wings are moved aft in order to set up a higher induced drag delta wing profile to facilitate a rapid deceleration and also to make formation easier and tidier.

Remember where that AUTO wingsweep switch position is on your throttle quadrant.

No really, *remember where that AUTO wingsweep switch position is on your throttle quadrant.*

Turn back in at three DME aft of the ship.

Roll out on the ship's course (note the reciprocal heading if you forgot before) at 800 MSL and 400 KIAS. Fly just to starboard of the ship, take it down the left canopy rail. Continue upwind, carefully holding wings level to fly the ship's heading.

Continue upwind for no more than 4nm. Break left when you dare, but the farther you go upwind, the more time you will have to trim and get stable on downwind, At the same time, the probability of lateral error increases due to simple geometry. Hold the BRC heading tenaciously.

The Break

I recommend initiating the break at 400 KIAS. Slower and things happen too quickly, faster and the turn radius is too large unless ample G is applied.

Find your sweet spot. Some like slower with less G, some prefer faster. Do you feel lucky, punk?

From 400 knots, roll into a left, 60 to 70 degree angle of bank turn and pull. Roll, then pull, immediately. Establish the pull, then reduce both throttles to idle and extend the speedbrakes. Keep your head out of the cockpit. Visually pull the nose along the horizon (you can reference the semi-useful flight path marker on the HUD if you like). The speedbrake switch must be held aft until full extension is achieved. Conversely, they are fully retracted by a momentary "in" selection.

About four to five G's are in order, but don't look inside at the G meter. You must get a feel for doing this maneuver visually.

If the nose sags below the horizon, then roll right to under bank as necessary. If climbing, then roll left to over bank, holding a constant back stick position initially. You are managing the lift vector to control altitude.

A few seconds into the break, your scan should move to airspeed, then back to the horizon. As you pass three hundred knots, click the wingsweep switch to AUTO and ensure the wingsweep mode on the ACM panel flips to AUTO.
Keep your scan going- back to the horizon, make any necessary correction in bank while you glance at the wing sweep indicator. You should see the wing mode in AUTO and the wings moving forward. If the wings aren't moving forward, then check the horizon and altimeter again, and manage your bank for a level turn.Try again to move the switch to AUTO. Check the wing tape and mirrors again to ensure that they are moving towards 20 degrees. Your human RIO should call out that the wings are moving. If all is well, you will be continuously reducing angle of bank as the aircraft slows in order to maintain altitude at 800 MSL.

If you can't get the wings forward to 20 degrees, then ease your pull, get your lift vector vertical, push the power up, get the speedbrakes in, ensure your descent rate is zero, and stop your deceleration at no less than 250 knots before investigating the problem. You don't want to get slow with the wings aft- you'll end up mushing into the water. That's happened in real life too. If you foul up the break, fly the pattern level at 600 feet and try again.

Practice actuating the AUTO wingsweep switch and seeing the wingsweep mode at a safe altitude before trying this at 800 feet above sea snake infested waters.

After ensuring that the wings are moving forward, the scan goes back to the horizon and then to the airspeed indicator repeatedly. When you see 250 knots (and two G's or less), extend the gear handle, *without looking at the keyboard or your controller*. Map the gear, flaps and hook to physical switches. Invest in a throttle quadrant, it will save your life. If not, well, sharks gotta eat too…

You can hear the gear move and thunk into place. No need to stare or wait for the gear to lock down.

Same with the flaps. Continue scanning the horizon, altimeter and the airspeed. When you see 200 KIAS, move the flap handle full down. As soon as your hand leaves the flaps switch, push the power up to at least 4000 pph to arrest the deceleration rate.

But Victory, your speeds are wrong!

Most squadrons were conservative with speeds. The gear/flap placard speeds are indeed 280/225, but waiting until 250/200 KIAS resulted in fewer flap/slap lockouts and gear issues. Remember, this is real world technique. *It is a sequence where speeds dictate actions.*

Monitor heading and roll out on the downwind heading that *you forgot to memorize* before. If this is the case, simply reference the heading at the bottom of the BDHI. The ship's BRC should be under the 180 degree reference mark.

You want to be close to wings level when deploying flaps, in case you get an asymmetry.

Speedbrake extension causes a mild pitch down, gear extension a moderate pitch down, flaps a moderate pitch down and finally DLC extension causes a mild pitch down. All require nose up trim.

You must monitor the speed to ensure that you don't get slow. When wings level downwind, engage and check DLC (I find that I have to look at the spoilers visually, in the real aircraft, DLC engagement was easily felt without looking, Heatblur is looking at modeling this). Just bump the switch in the down direction to ensure the spoilers extend fully and DLC is in fact, working.

Descend to 600 MSL, trimming as you decelerate. Attitude in the descent should be about 7-8 degrees nose up. As you approach 600 AGL, raise the nose to approximately 10 degrees and trim like a mad man. Watch the VSI for trends. If it sags, don't wait for the change to show on the altimeter, add power. The VSI shows trends immediately, but lags for actual rates. All barometric instruments lag somewhat.

Look at the AOA indicator. As the tape rises towards the 15 unit approach reference, lead with throttles and push the power up to approximately 5200 pph while placing the nose at approximately 10 degrees nose high. There is a pitch line at 10 degrees of attitude.

You are transitioning speed reference from the Airspeed Indicator to the AOA Indicator to the AOA Indexer. The Navy flies AOA for landing due to its superior precision.

This is a critical- You must trim to hands off in pitch, roll and yaw after the power is set, and you must take time to find the power setting that will produce on speed in your aircraft's configuration. *It will change* if you have tanks, missiles, bombs or even battle damage or asymmetric stores left. You have to find the fuel flow setting that works for your airplane on that day.

The thrust line on the F14 is below the center of gravity, so when you add power the nose pitches up, and when you reduce power it pitches down. That's why trimming on downwind needs to be accomplished with the power close to a stable on speed setting.

You must get trimmed hands off on downwind, and you don't have much time to do it.

Forget using the pitch on the HUD or the E Bracket. Both ratcheted in the aircraft, weren't accurate, and updated too slowly to be of use. The pitch isn't referenced to the actual horizon. If you try to fly the HUD like you did in a Hornet, then you will be disappointed. Everyone I knew turned the HUD off for Case I Landings. We even turned it very dim for Case III approaches. Use the AOA Indexer.

In the sim, the velocity vector works better than it did in the aircraft, so if it works for you, feel free to put it where you think you need it. It isn't very accurate, frankly, but if it makes you feel better…

Run the Landing Checklist when able - Say it out loud to Jester, and move your left shoulder so he can see and confirm the gear and flap indicators. It is one, long sentence, checking each item-

"Wings are twenty auto, Gear's down, SAS on, flaps full, DLC engaged and checked, Hook down, Harness locked, Speedbrakes out, Spoiler Brakes off, Brakes are good, Fuel is _____"

Ensure that your fuel state puts you below the Max Trap Weight (54,000 lbs).

If at anytime you get slow, you'll get wing rock, pick up a ton of drag and start to settle. Get the power way up, either actuate up DLC or turn it off and reduce the pitch attitude. Never accept a full slow condition (AOA Indexer Green) anywhere in the pattern.

Abeam Distance

I love the gang at Heatblur. Not only are they are geniuses that fought like hell to get the flight model and unique F14 handling characteristics correct, but they even put a Ticonderoga Class Cruiser exactly one mile abeam the aircraft carrier for reference. How awesome is that?

The abeam distance should be 1.1 to 1.3 NM abeam, based on the ship's TACAN. The cruiser escort is at 1 DME, so take it down your port side canopy rail. With the TACAN Mode selected on the PCDP, you should see about 1.5-1.6 DME on downwind with the bearing needle at 45 degrees left of course. If you are well off, take a quick cut and turn back to the downwind heading by the time you are abeam the boat.

With experience, you can just look at the ship out of the break and have a good idea as to where you are. Don't blindly follow the aircraft in front of you, he may be AFU on the abeam distance.

Note: *The pilot that fouls up the pattern gets waved off*. A long in the groove aircraft for instance, screws up the landing interval for the following aircraft. Therefore, the LSO's waves off the long in the groove and lands the following jet. If interval permits, then Paddles may let a long in the groove land, but the pilot will be debriefed and be expected to fix it. The point is to land all airborne aircraft as quickly and efficiently as possible. The longer it takes, the less time for re-spot, maintenance, and the ship remains predictable the entire time it is steaming into the wind.

The pressure is always on.

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Distance from the ship affects time of turn, length of groove and therefore, altitude required for a centered ball at the start . Therefore, if wide abeam, you turn earlier and use less angle of bank and a lower rate of descent, if close aboard you turn later, use more angle of bank and a higher rate of descent.

Sometimes due to the smaller vertical component of the lift vector in a larger bank angle turn, slightly more rate of descent requires more power.

Let's look at a typical Max Trap Approach Speed of 137 KIAS and the required geometry to arrive in the groove. We will assume 20 knots WOD for a closure speed of around 115 knots

TACAN Distance Abeam	Actual Turn Diameter	Angle of Bank Required	Time to Turn 180 degrees	Delta Time in Groove	Delta Distance in Groove
0.9	1.0	30	39 sec	-10	- .32 nm
1.0	1.1	27	44 sec	-5	- .16 nm
1.1	1.2	25	49 sec	0	0
1.3	1.4	22	56 sec	7	.22 nm
1.4	1.5	20	60 sec	11	.35 nm

Turn diameter is slightly larger than TACAN DME because the aircraft overshoots the axis of the ship to align with the angled deck, and the location of the TACAN itself is on the ship's mast to the right side of the deck.

Analysis shows that the wider abeam, the earlier you need to turn to arrive at the same point in space to achieve a proper 15-18 second groove length. The difference in turn diameter between a 1 mile turn and a 1.5 mile turn using 30 vs 20 degrees AOB is three quarters of a mile in distance. That's huge in terms of altitude if the pilot uses the same standard, 700 fpm rate of descent. He'll be low if starting wide abeam, and high if starting close abeam without adjusting rate of descent for the lateral error.

You start each descent from 600 MSL, so the difference in time to turn means that closer abeam requires a higher descent rate to get to the glideslope altitude intercept, while the wider abeam means a lower descent rate is required.

On the downwind heading, with the TACAN bearing needle 45 degrees left of course, 1.5 to 1.6 DME will result in 1.2 DME at the abeam point. If you pass this benchmark too close or too far, you can take a quick cut to reduce the abeam distance error. This seems less than it was in reality, but that's what I've found so far in DCS.

Hopefully, this shows why abeam distance is critical, and why getting it right in order to get consistent, good starts is worth the effort.

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The Approach Turn

Let's assume a baseline of a correct 1.2 distance abeam, on the downwind heading, trimmed on speed. *You are flying instruments, 10 degrees nose up, looking at VDI.*

Glance at the BDHI - the tick mark that is 90 degrees to left of the downwind course shows the "90" heading, which will be your heading when you want to be at 450 MSL. If wide, be higher at the "90", if close abeam, be slightly lower.

As the TACAN needle approaches 90 degrees on the BDHI, prepare to turn. Glance at the ship..

Abeam the LSO platform, just before you see the end of the flight deck, it's a couple of potatoes past the Ticonderoga, if it's there. *Using coordinated rudder and lateral stick*, smoothly roll into a 25 degree angle of bank. You are looking for a slight rate of descent, about 150 fpm in order to arrive at the 90 heading at 450 MSL. This requires *a very slight addition of power.* Sometimes, simply trying to stay level results in the correct descent rate. Pitch attitude should be about *a degree or less than level.*

This is where we're going to cheat by using the ICLS needles to offset the difficulty in seeing the ball. As you approach the 90, the ICLS needles will flutter and pop into view. If you are on glideslope, then ease the power slightly to smoothly to set a 5-600 fpm descent. I find that with a clean jet in the release build that around 43-4400 pph is in the ballpark. This will change as the engine thrust is tweaked, and will be very different in the F14A.

If you are high, then ease the power a bit and reduce the pitch a degree to achieve 7-800 fpm, but once approaching a centered GS, you should lead your power application and go back to the baseline pitch attitude and fuel flow *before arriving on GS*.

If you are low, then add power to reduce your rate of descent, increase the pitch attitude if necessary, and lead the power and pitch reduction back to baseline as you sneak up on the glideslope from below.

Every time the power is changed, the pitch will change. You can help the response to the power changes by easing the nose up or down *slightly* with the stick. Make small fuel flow corrections around the baseline setting, watching and tweaking the pitch on the VDI. Don't over control with stick in pitch.

Your hands work together.

Since the turn commenced, we still haven't looked at the ship. We are flying solely on instruments using the VDI for pitch, a little stick input for AOA, fuel flow for power and constantly refining trim.

On final, the pitch will be about 7-8 degrees nose up, with fuel flow around 44-4300 pph, 700 fpm descent should hold you on glideslope.

The way to find your baseline on glideslope is to set up a long, on speed, precisely trimmed up final approach from say 3000 MSL fifteen miles behind the boat. Fly the ICLS glideslope down as carefully as possible. Write the fuel flow and pitch in grease pencil on your computer screen. In SME testing, I've probably flown 200 miles in the landing config, performing level flight and approach descents to find my own baseline numbers.

Just past the 90 degree point, after you have made a correction for the glideslope error, take a peek at the ship. You probably won't see the ball yet, or if you can, you won't be able to tell where it is on the mirror. Go back inside, check rate of descent, pitch and power, the ICLS needles if they pop into view, and ensure that you hold the angle of bank that you set at the beginning of the approach turn.

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When you begin to look at the ship, there is a tendency to shallow the bank angle. Don't do it or you will overshoot. The ship looks close, you may feel high, but since the ship is moving away or there is at least 23-25 knots of wind, you are fine. The geometric glideslope is higher than the apparent glideslope due to wind and or movement.

Play the turn to the rollout on centerline. The deck is short, making lineup difficult to ascertain, so overshoot the wake slightly, tuck it under your left armpit to align with the centerline of the angled deck. Roll out two or three degrees right of the angle deck course (Final Bearing, just eyeball it).

It's worse at night without a horizon. The tendency is to match the ship's roll angle and drift accordingly. Be glad that it is daytime. You are inside and outside, referencing the ship and performance instruments in the cockpit.

Anytime you reduce angle of bank, you need to reduce power. The opposite is also true. We are transitioning to a visual approach now, but we are still glancing at the VSI and pitch on the VDI. Guess what, you can also reference the actual horizon in relation to your canopy bow, and you don't need a HUD to do so. Simply be aware of the attitude using the natural horizon like a 1920's Airmail pilot did.

In the sim, this is where it may be worthwhile to keep the HUD turned down or in night mode. It allows you to reference the ICLS needles until you can make out the ball. Don't reference pitch or the E Bracket on the HUD, just the ICLS needles. Better yet, turn it off and use the ICLS needles on the VDI.

As you roll wings level, the lift vector is again vertical, so the aircraft will tend to balloon. A relatively large power reduction is required to avoid going high. Don't let the nose drop, try to hold what you've got. As soon as you have the power off, you will need to put most of it right back on to the baseline setting. This must now be done by feel of the throttle position while you look outside, and is much more difficult than in real life, where seat of the pants helped. With small power corrections, your careful trimming should be taking care of Angle of Attack, and it shouldn't be a variable anymore.

There is a tendency to get slow here in the sim, because the pilot subconsciously holds the nose up during the power transient, and doesn't trust trim. You must be on speed, and the slight crab angle to the right is to account for the landing area's left to right movement. *There is always a crosswind effect at the boat.*

I know, it's tough to see the ball with the HUD camera and canopy frame in the way. Move your freaking head until you can see what you need to see.

You've got the ball now and can tell where it is in relation to the greed datum bars, tell your RIO and he will call it for you. I just say "ball" over the ICS and let Jester do his thing.

The scan is now outside, and is Meatball, Lineup and Angle of Attack (the Indexer Donut). If lineup is squared away, you can glance at VSI, but look immediately back at the ball and lineup. Your mind's eye will remember the VSI picture. If it is greater than 700 fpm and you are on GS, then add a little power. If it was less than 700 fpm and you are on GS, then reduce a little power. Don't wait for the ball or GS needle to move, you are making a correction before the need manifests on your visual aids. The farther out, the larger the width of a given cell on the IFLOLS so you can see a centered ball while descending through the centered ball "window" on your way to being low, if that makes sense.

If you are confident in your trimming with respect to AOA, as you get closer, transition your scan to meatball and lineup only, and standby for a settle behind the round down due to down draft. Tell yourself, "keep those eyeballs moving".

Is the burble really modeled? Damned if I know, but there tends to be a "psychological" burble for me, perhaps it is ingrained in my subconscious mind from seeing the ass end of too many boats.

The “burble” is simply a downdraft behind the stern that hits the water, bounces off, and causes an updraft further out. Nothing mysterious, just airflow over and around the boat as it glides on the sea. It’s not supposed to be modeled yet, but I still tend to settle. Weird.

If you do suffer from hallucinations like me, and see the ball even begin to twitch, then add power to stop it, and get it right back off. Each power correction requires three movements. One to initiate the change, one to arrest it, and one to get back to baseline. It is exactly like flying formation in that regard. Each power change requires a little pitch change as well. The amount of throttle movement comes with time and practice.

If you go flat over the ramp, you will notice a rising ball. If this is the case, then ease the power and *bang twice on the DLC.*

You thought I forgot about DLC didn’t you?

“Bang twice, no more no less, never thrice and never just once. Twice it shall be if needed at all to fly the ball…”

You can quote me on that.

Don’t hold the button down, but don’t be timid, hit it twice to keep the ball from rising while easing the power a smidge and get it back on when you see the ball stop going up. You may need a burst of throttle if you hold the button and come down like a ton of proverbial bricks, but usually not. If you need more DLC than what I described, you’re probably out of parameters. Take your Bolter like a man.

Fly the pass with throttles for glideslope control. DLC is not designed for use throughout the approach for reasons beyond the scope of this missive. There are warnings all over NATOPS about this. The engines are quick to respond, put them to good use for glideslope control.

Do not get mesmerized by lineup and forget to look at the ball. In close, the scan goes from meatball, lineup, to meatball, meatball, while relying on peripheral vision and LSO calls to address lineup.

When you trap, go to mil power, hold the speedbrake switch in (they retract at mil anyway) and hold mil power until you stop. Immediately raise the flaps and engage nose wheel steering. Look for the yellow shirt to your right. He’ll tell you when to raise your hook. By the time that’s done, your flaps will be retracted and he’ll give you the signal to sweep your wings aft. Wing wrestling will now commence.

In the sim, go to an outside view, chase works well, and look for the cable to become rounded and just forward of the hook point. When you see slack, you can retract the hook without fouling, engage NWS and taxi out of the wires. Be patient, let the crew pull you back and release the tension.

If you bolter, then go to mil power and let the nose pitch to 12-15 degrees. It will take a strong push and you will have to hold the trim switch in the nose down direction to stop it due to the pitch up moment of power and excess trim from the approach. Climb straight ahead for ten seconds or so, then turn 10 degrees to the right to parallel the ship’s BRC. At 400 feet, reduce the power to baseline (5200 pph), set ten degrees nose up pitch on the VDI and manage the level off at 600 MSL. Trim like a mad man.

Remember the BRC. The turn downwind is as critical to the pattern as is the turn to the groove. Maintain slightly above on speed (you will be fast after the bolter) and bank angle at 25-27 degrees. Don’t be shallow on the bank angle.

Engage DLC, extend speedbrakes and slow to on speed as above. Trim, watch your altitude and roll out on the downwind heading that you previously wrote on your computer screen. Check fuel, you just added time to your flight. Do the Landing Checklist again. Take a deep breath, do better on this pass.

If you wave off, hold forward pressure on the stick to prevent an increase in pitch, which lowers the hook, and can result in an inflight engagement and violent slam onto the deck.

I recommend that you select mil power on a go around *in the sim* by banging the throttles full forward and then immediately pulling them back to where you think mil should be. This technique will ensure that the speedbrakes retract and DLC disengages. The engines won't spool up quickly enough to engage AB.

I also strongly recommend that you put the hook up and do touch and goes as often as possible. You'll get twice the number of passes in a given time span. Put the Hook Bypass Switch in FIELD to get rid of the flashing AOA Indexer.

Corrections

Abeam distance. If wide, turn a few seconds earlier and use the appropriate bank angle from the nifty matrix above. If close, turn two seconds later than normal, go immediately to 30 degrees AOB, and add a little more power than usual to keep the rate of descent slightly higher than baseline. You will still need a little more power because your lift vector is more horizontal due to the steeper bank angle.

Again, if ***slow***, add generous power and reduce pitch with the stick. Slow will cause wing rock, increase the drag massively and result in a high descent rate if not arrested immediately. Significant power will be required to remedy a full slow condition. Slow makes a mess. Avoid it at all costs.

If ***fast***, then ease throttles to put fuel flow below baseline. Hold the nose up to negate the natural pitch down, and as the aircraft decels to on speed, go to baseline pitch and power as you approach within a half unit of on speed. You have to use both the AOA indexer and the donut, and you may have to nudge the stick to get things heading to where you want them. If you are low and fast, pitch up and used the excess energy to climb to the desired altitude, input power as necessary as you approach on speed. If slow and high hold your power and reduce pitch to accelerate to on speed. Play your energy.

Do not accept being out of ***trim***. Work the trim to hold the 15 units approach reference *hands off.*

Slightly slow around the turn before rolling out in the groove is fine. As you roll out, you'll go on speed. Full slow is not acceptable. Full slow or Fast will result in a technique waveoff. The jet must be on speed. Fast or slow affects hook to eye distance dramatically in a long jet like the F14. If you are slow with a centered ball at touchdown, you'll catch an early wire. If fast at touchdown, the opposite is true, and you'll have a propensity for hook skip bolters as well.

If you ***overshoot the centerline***. Use no more than 30 degrees angle of bank during the turn. Wave off and take it straight up the starboard side of the ship if necessary. Take your waveoff like a man (even if you are, or identify as a girl), and live to fly another approach. No one said that this was easy.

Stay in coordinated flight in all turns, especially late lineup corrections close to the deck, don't use bottom rudder in an attempt to sweeten your turn.

Angling approaches tend to cause overshoots. If you are angling, then lead the turn into the groove, knowing that it will be more acute than normal. Angling puts you closer to the ship while off centerline. It complicates things dramatically due to the real world lens geometry. Know the bank angle for abeam distance in the matrix above.

Due to lens roll angle, a centered ball when left of centerline is actually low- right of centerline is high. The visual glideslope is only accurate when the aircraft is on centerline. Roll angle is used to shift the plane of the glideslope to accommodate the difference in hook to eye distance on different aircraft.

Your eye references the visual glideslope, but the hook is hanging 10 feet below. The Tomcat had the largest hook to eye distance in the fleet. AFAIK, it isn't modeled in DCS….yet.

Additionally, if you are fast you have a lower pitch attitude. So with a centered ball the hook is on a higher glidepath than it would be if you were on speed. Fast with a centered ball often results in hook skip or even long bolters. If slow, then the hook is lower with less ramp clearance than if on speed. If you landed a little fast, then you could try to "set the hook" by pulling back on the stick right at impact. Sometimes it worked and you'd snag a "lucky four wire".

The Tomcat was also heavy and taxed the arresting gear. The rollout length was logged for every landing to ensure that the arresting gear was set correctly and also that the total energy of the landing was within limits. Because of this, a full fast would usually get you waved off in real life. LSO's determine the angle of attack of the aircraft by the relationship of specific items on the jet, not so much the external approach indexer. Landings made well above 15 units in the sim (14 units is OK if single engine) are invalid in my book.

I don't care which wire you snagged, it's how you got there that matters.

A three wire is meaningless if you are fast, slow, got a bad start, overshot or angled on final, landed more than two or three feet left or right, or had drift either way at touchdown. Fair at best, No Grade likely depending upon magnitude.

If you are struggling with speed control, then for training purposes, you can try slightly fast (donut and chevron) to start the turn, and help throttle corrections with pitch inputs, but no faster. This will give you a little energy to work with as you develop feel and experience. Then work towards on speed the whole way, using throttle and small pitch corrections to control rate of descent.

You should be aligned with the centerline when you land. A gross lateral correction in close to attempt to touchdown on centerline from a full left in close can put you over the port side of the ship. Very embarrassing. You can also break an arresting by cable landing off centerline. I saw that happen once.

Land within a few feet of the centerline, *parallel to the centerline*. The Tomcat has a long wingspan, and will start clipping expensive government property not to mention wiping out good people if you get careless with the centerline. If you like to land anywhere you please, go see a USAF recruiter.

At the field, the pattern is slightly higher, mostly for noise abatement and visibility over trees and such. The break was typically at 1000 AGL and downwind flown at 800 AGL. Less power is required for descent. The engines and therefore the ball also reacts more slowly because there is usually less headwind so you are back on the power compared to the ship.

The reason we land with speedbrakes extended is to put the engines into a higher thrust band where they are more responsive. It also allows the pilot to dump drag immediately to correct a high rate of descent.

The gear and flaps are left in the landing config to reduce wear and the chances of a gear up landing (it happened once in the F14 during FCLP). The Navy does a massive amount of touch and goes.

Autothrottles require a different approach technique that will diminish your understanding of normal ball flying. It requires pitching the nose, which changes the hook to eye and ramp clearance as described. I only used them on downwind or when flying the Case III pattern for an Autoland attempt or workload relief when busy doing something else- which at night, was usually praying.

F14 Carrier Landing Tips

by Victory 205 *Rev 2*

Fuel Management

Fuel is managed by declaring a *desired fuel state* at the actual recovery time a flight is expected to land. Flight leads would set this fuel state based on host of factors, and work backwards. Crews made a matrix listing the total fuel needed at the max conserve fuel flow every fifteen minutes. If the actual fuel was above the required fuel at a time on the matrix, then you had fuel to play with. If the actual fuel state ever reached the calculated fuel at a point in time, then the crew had to go to max conserve fuel flow to make their desired fuel at the recovery time. It is a simple concept- a fuel vs time Howgozit. Fuel states is constantly checked. Think of fuel as time. Navy pilots know to conserve fuel.

Mindset

*Work like hell to get a **good start***. Traps are easy if you roll out in the groove on speed, on centerline and on glideslope. Do that, and you've got it made.

If you are inconsistent in the pattern, you will be inconsistent in the groove.

Trim is your friend, but it requires constant attention. Constantly check for hands off trim.

Coordinated rudder and lateral stick in all maneuvers in the landing configuration.

Spend some time learning the **baseline** pitch and fuel flows for **level**, a **200 fpm descent** in a 25 degree AOB turn, a **700 fpm descent** in a wings level descent. Go to those numbers when you are on profile. <u>You must</u> take a few minutes to find what works for you. Write the numbers down. I do.

Once trimmed on speed, make tiny pitch corrections in concert with power changes only.

Practice. Don't blow all of this off and show up asking for help. Do you want to be a carrier or pilot or not? It takes time. Put in the work. You'll get there if you do.

See you in the groove, on speed, with a centered ball.

Remember*. "Fly Pretty, Anyone Can Fly Safe…"*