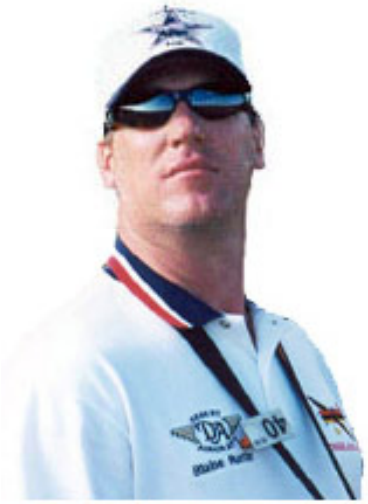

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3D TIPS

3D with Blaine

You've heard about these new 3D maneuvers, maybe even seen some but if you're like most flyers you really don't know exactly how to do them. Below Blaine will try to explain some of the maneuvers and how to do them. Blaine has also asked some of his good friends and fellow 3D flyers to help out with their explanations on a few maneuvers.

What is 3D Aerobatics?

It's maneuvers performed when the airplane is in a stalled condition. Maneuvers that are done with the airplane nose high at 45-degree angles, hanging on the prop or tumble tail-over-nose gyro rations .

What makes a good 3D airplane?

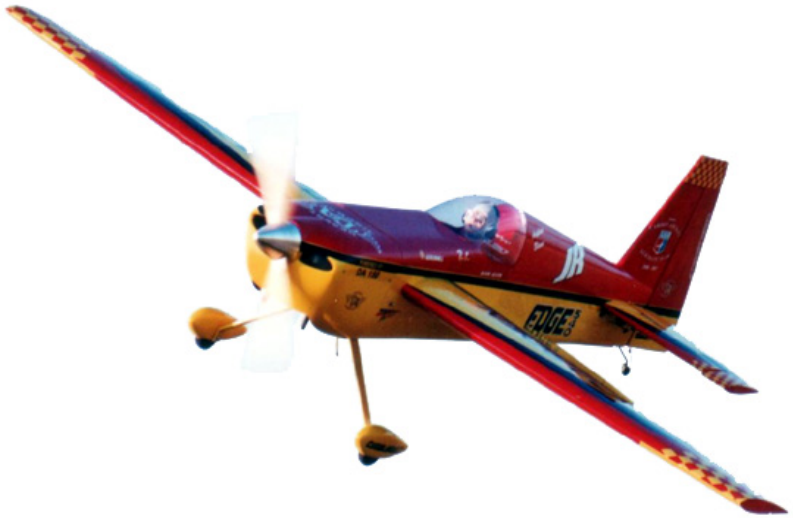
I get asked this all the time. You need to have a plane that's capable. What's capable? Well, it starts with having lots of throw in your control surfaces and you need a very powerful reliable engine. Some airplanes just 3D better that others. I personal like the EDGE & EXTRA for doing 3D. I think it is hard to beat the way these two planes fly in 3D attitude.

Links

Jeff Newman

Legal Information

Updated 08-08-09



The Maneuvers

Blaine and a few of the best 3D pilots in the World will cover the "How To's" of the most popular 3D maneuvers and a few original ones

"The Torque Roll"

"The Pogo"

"The Elevator"

"The Harrier"

"The Waterfall"

"The Panic"

"The Blaino Draino"

"The Snap Up"

"The Yo-Yo"

"The roller coaster"

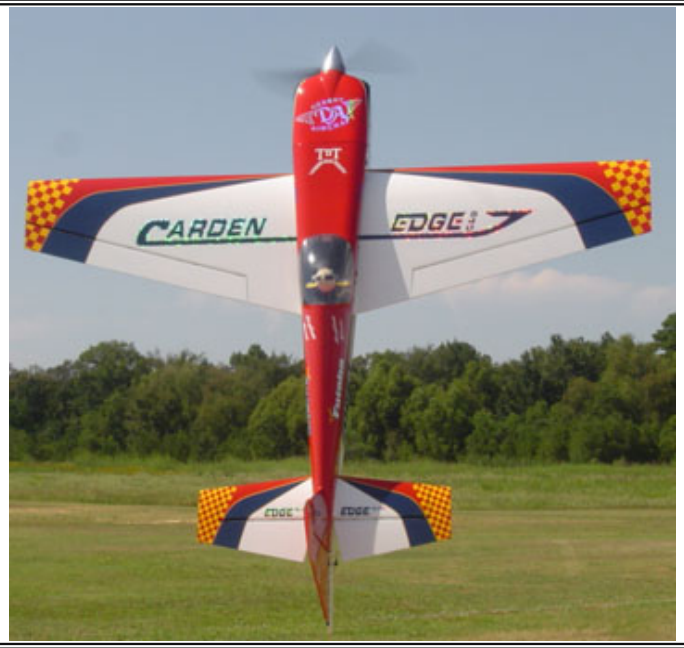
"The Terminator"

"The Wall"

"The Harrier Roll"

Click on the pictures below to view a short video on the maneuvers. ***Coming soon.***

Snap up video & Blaino Draino active



The Torque Roll

With Airplane Blaine

What it is:

Plane "Hovers" vertically in place, rotating left around its roll axis.

Plane set-up:

Full 3D throws in elevator and rudder are a must. An aft CG helps a little also. Some flyers will run their CG back to make this maneuver easier, however I have found that a plane that is balanced will Torque Roll just as good as one that is tail heavy. It all about getting the plane in the sweet spot. Once you get the plane completely vertical it become very easy. That is the hardest part is recognizing the true vertical plane. The pros will also tell you to add 3/4 degree of up thrust to your

engine. This helps keep your plane from falling forward in the Torque Roll, and it'll fly straighter up lines in non-3D maneuvers, too.

How to do it:

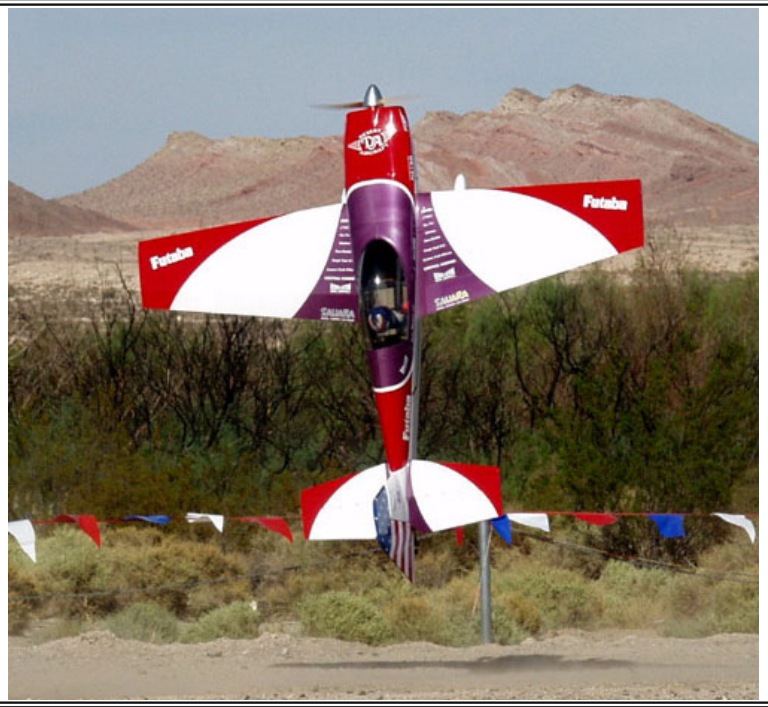
The easiest way to learn is to start by learning the "Elevator" and then the "Harrier". After you have mastered this it is an easy transition to the Hover. Once you can "Hover" then "Torque Rolling" is the next step. As your plane descends in an "Elevator" start adding power as your near the ground this will transition you into a Harrier. All you have to do from here is give a short burst of power and your plane should stand up vertically. Adjust throttle to keep the nose pointed up and make corrections with rudder and elevator to keep things straight. One thing to remember is that most planes want to fall off to the left and toward the landing gear. (Tip: Most of the inputs that you give are up elevator and right rudder.) The throttle curve is key for this maneuver. Set your ATV or Travel to the maximum %. You will then need to find a servo arm that enables you to open and close the carburetor completely without backing down your travel. This is getting your throttle mechanically perfect as you can get it. The next step is setting up your throttle curve. This takes a little time and patience but it is well worth the time and effort. The key is that once you find the stick position that the plane will hover, you want to set your curve so that your are hovering when the throttle stick is at half throttle. You adjust your curve from there as needed to barley let the plane climb or decent with one click up or down on the throttle. This really keeps you from fighting with the throttle and lets you focus on controlling the plane.

Trickiest part:

Recognizing your correction when the plane's belly is toward you. (Tip: Think push the rudder toward the low wing when the belly is toward you.) You have to be fast with throttle corrections. Most flyers add "bursts" of power, along with rudder/ elevator corrections. If you simply hold full throttle, you'll climb out of the maneuver. One of the most common mistakes is giving wrong rudder inputs when the plane is belly in.

Recovery:

Fly out at full throttle.



The Pogo

With Jason Shulman

What it is:

Hover that climbs and descends.

Plane set-up:

Normal 3D set-up.

How to do it:

Establish your controlled hover. Make sure the plane is vertical and stable before performing. Apply power (3/4+) for 5 feet. Bring the power back (1/4-). "Fly" the plane back down the line. Apply throttle as needed, but in short bursts. Make sure the plane remains vertical on the descent.

Trickiest part:

The descent. Trying to fly the airplane backwards without any prop wash over the surfaces can make for some very uncontrolled times.

Recovery:

Full power (away from anyone or anything). It's just like getting out of a hover.

Thanks
Jason

The Elevator

With Chip Hyde

What it is:

The Elevator is when you completely stall the aircraft with a massive amount of elevator, either up or down, and it descends almost vertically down (Elevator) upright or inverted.

Plane set-up:

There are two things needed to do the Elevator correctly, 1. The CG on the tail Heavy Side. 2. 45+ degrees of Elevator

travel. Of the two, the 45 degrees of travel is the most important to have. A straight Leading Edge wing will also make it easier along with having Counterbalances on the elevators.

How to do it:

The easiest way to enter this maneuver is to go up a mistake or two high, and dive straight down. once the plane is pointed at the ground, after making sure the high rate elevator is on , pull full up, and hold it. Do not release it or hesitate when pulling, that allows the nose to come down and the plane will try to start flying again, then the wings will start rocking, and it won't look very much like an Elevator. If the nose comes up when you pull and then drops again, you can either add a click or two of power immediately after the pull, or move the CG back a little more.

Trickiest Part:

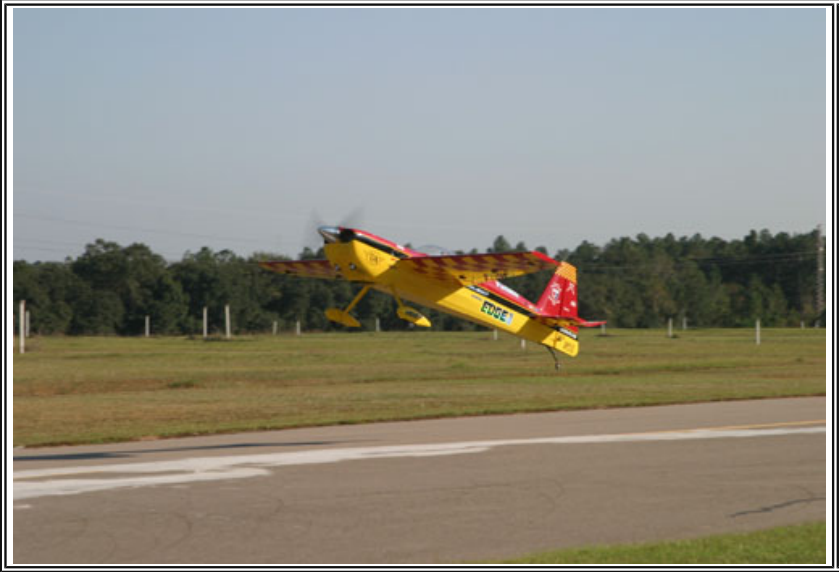
There is not anything super hard with this maneuver, as long as the above is followed. Most of the time people will not pull and hold the elevator, and the plane tries to fly out of it, still at a stall though and then starts rocking the wings (PIN THE STICK)

Recovery:

To get out of this maneuver, power can be added while releasing the elevator slowly and just let the plane fly out, or simply release the elevator, the nose will fall through, build some speed and gently pull out

This is how I set my planes up and how I do an elevator.

Chip



The Harrier

With Blaine

What it is:

Very slow forward flight in a very nose high (about 45º) attitude.

Plane set-up:

The same as the elevator.

How to do it:

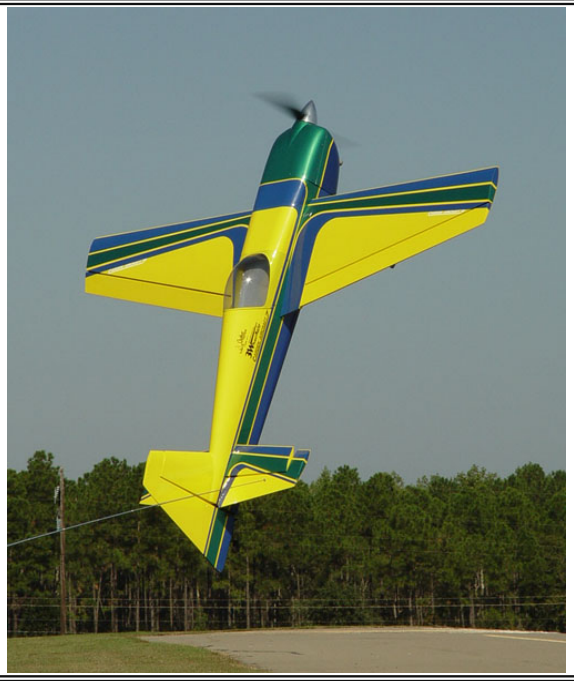
Start by entering an "Elevator". Let the model drop a little, then slowly add power until the vertical descent stops and it begins to fly forward with the nose very high- holding full up elevator (on 3D rate). Use throttle to control the plane's attitude and forward speed. In a head wind, you may also have to work your elevator to keep the plane from rotating up to a vertical attitude. Use the rudder to steer the plane around in the Harrier attitude. Try to use the ailerons very little, as they will cause the plane to wobble side to side.

Trickiest part:

Keeping the plane from standing up vertical and controlling your altitude.

Recovery:

Simply add full power and reduce elevator to transition into normal forward flight.



The Waterfall

With Wes Batson

What it is:

The waterfall is a maneuver where the plane pivots 360 degrees in the pitch axes with very little forward motion and altitude gain or loss.

Plane set-up:

The primary control surface is the elevator followed by the rudder and finally the ailerons. The control rates should be set for maximum deflection, not that you will need that much, but it's a good place to start. Later, if you find that your consistently not using max to do the maneuver, you can dial some out. Remember the plane will be VERY sensitive in these rates. There's two ways to manage this. One, is to have dual rates, the other is to have a lot of expo dialed in to make the plane less sensitive around the neutral point of your radio.

How to do it:

The waterfall is a fairly easy 3-D maneuver to learn. There's two ways to enter. One, from a harrier, the other is from just above a stall. Let's start from just above a stall. From a safe altitude, slow the aircraft until you feel that it's at it's slowest CONTROLLABLE speed. When the plane is directly in front of you, push full down elevator and apply enough power to rotate the plane 360 degrees back to the upright position. How much power? That will depend on the type plane and engine. Start by using full power, after a while you will be able to tell how much it actually takes to get the plane to rotate.
Entering from a harrier will basically the same. It's actually a little easier because the plane is in a nose high attitude and will have more momentum as the nose comes down on the rotation.

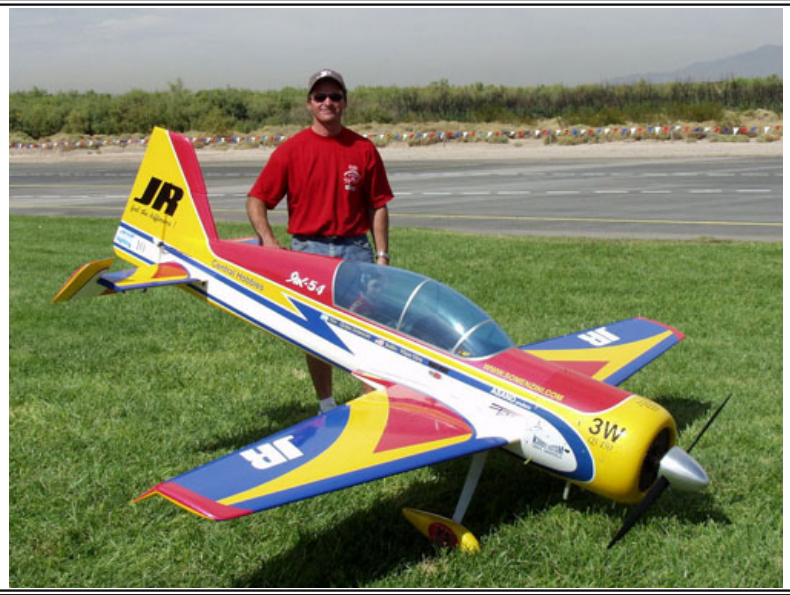
Trickiest part:

The hardest part is keeping the plane from falling off of one side or the other. The rudder is the most effective control having the most air moving by it because of engine thrust. The first few that you do, the plane will probable fall one side or the other. Use rudder opposite to the fall to keep it upright. Ailerons help some, but remember, this is a 3-D maneuver and the plane's not flying. There's very little air moving over the wings so the ailerons are not very effective. The other tricky part is stopping the plane as it comes over the top. You can either fly out by releasing the elevator and keeping the power in, or go right into another by not releasing the elevator. With practice, you can get the plane to make consistent small tight circles in a very small space.

Recovery:

This is a pretty safe maneuver if you keep enough altitude. The thing to remember is, THE PLANE'S NOT FLYING! If you over rotate the nose pasted level and want to recover, first get the plane flying by releasing the elevator and keeping the power in. If you fall off to one side, again, RELEASE THE ELEVATOR, use ailerons to get the plane upright, and use enough power to get the plane flying

Thanks
Wes



The Panic

With Quique Somenzini

This is an original maneuver by Quique

What it is:

The Panic, or Blender maneuver is a vertical diving roll that virtually stops its descent as it instantaneously enters into a flat spin. Presented at TOC 1998 and named by Blaine, I designed this maneuver always looking for the highest performance at what it is called surprise factor and I remember it did work very well. You climb high, guessing 300 feet idle and punch down to a perfect vertical line, add some left aileron to do a kind of slow rolls during that dive. Then when you reach an altitude that is good for you, the airplane will suddenly go to a flat inverted position.

Plane set-up:

Simple, nothing special here, you need to go to your set up that you use to do the 3D aerobatic, so high rate a a lot of deflection. I recommend you to have at least this numbers. Rudder 45 degree, elevator 40degree ,aileron 35degree. If you can go for higher number it will be better because the quick spinning will be quicker and tighter. CG do not need to modify for this maneuver, I found a bit better when the CG is on the nose heavy for 3D aerobatic.

How to do it:

Climb as I explained before, make sure before you push vertical to have all at high rate, this is important to avoid crashes!, so dive rolling slow left and when it is the time to spin, use this technique, full down elevator, full right rudder and full left aileron, this is the best sequence too. This sequence needs to be done continuously, this means as soon you reach full down you go right rudder and as soon you get with the rudder to full go with the aileron. All the movement of your thumbs needs to be quick. This is a very hard maneuver for the airplane and you actually can bend the wing tube! or if the wing it is

not strong enough even worse you can crash the airplane! so to reduce the G's when you decide to do the spin go with the sticks slower to the full position, this will make the airplane to start to spin with less angle of attack loading less the airplane. If you feel you putting to many G's to your airplane try this sequence, full aileron then full rudder and elevator at same time, but the rudder and elevator should not go so quick to full stick position, go a bit slower. Once you see your airplane it is spinning flat open the throttle to full position to increase the spinning and to maintain altitude, keep the power at that position till you feel the airplane wants like to fly out of the spin. From that inverted flat spin you can do any thing you want!, like go to a torque roll, Cobra, etc.
Then you can do what I called "multiple Panic", so you go higher and do 2 or 3 panics depending on the altitude, once your airplane it is on inverted flat spin, idle it back neutralize all flying surface and pull full up till you see the nose vertical down, then you are again in position to do another panic and so on.

Take care.

Quique

Click on PIC for video

The Blaino Draino

This is an original maneuver by Blaine

What it is:

It is very similar to the Panic. It was unveiled by Blaine at the XFC.

Plane set-up:

Full 3D throws.

How to do it:

Start from about 10 feet straight and level, pull vertical. When you get to about 150 to 200 feet, chop throttle and pull full elevator and flip back over with the nose straight down. As soon as the plane is diving straight down at low throttle, add full right aileron. Let it complete 5 or 6 rolls, then quickly stop the roll about 25 feet of the ground and pull full up elevator and full power all at the same time. If you do it right, the airplane will instantly transition into a Harrier with rudder getting very close to the ground. When you get good at this you can actually touch the ground with your rudder. This is a very daring maneuver and should only be done with lots of practice up high.

Hardest Part:

Getting your timing down and not hitting the ground to hard.

Recovery:

There is really no recovery from this. You either do it great or hit the ground hard.

Click on PIC for video

The Snap Up

With Blaine

What it is:

The Snap-Up is when the airplane comes to a stalled stop into a vertical position from a horizontal flight path with a snap-roll in the middle. This is very similar to a Pop-up or Wall.

Plane set-up:

Full 3D Throws.

How to do it:

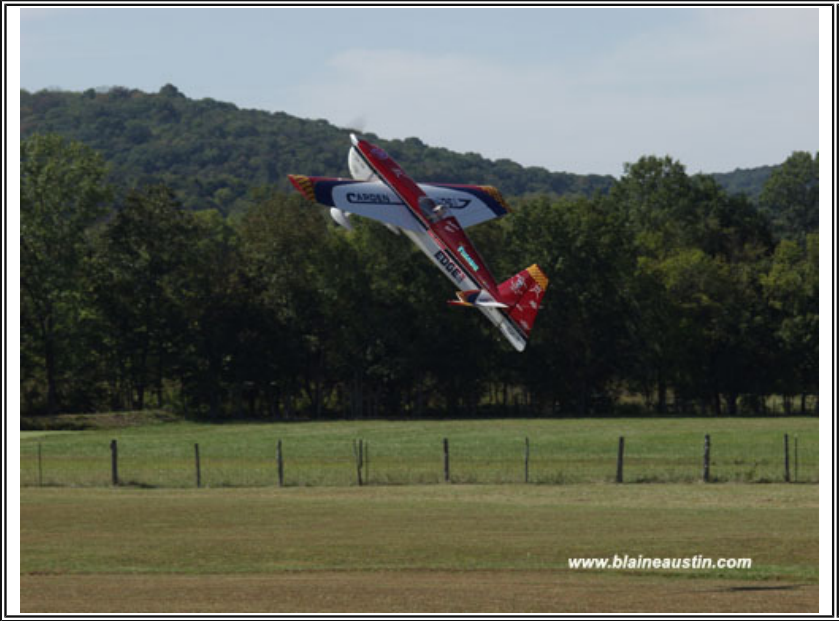
Enter from level flight into the wind with power off. Pull full elevator and full right aileron at the same time. (neutral on the elevator and aileron as soon as plane is vertical) The plane does a snap roll into a wall basically.

Trickiest part:

Don't under rotate. If you do the plane will be pointing nose down toward the ground. That's not good unless you have plenty of altitude. Practice this up high until you get your timing down. This is a real crowd pleaser when done correctly.

Recovery:

Full power climb out.



The Yo Yo

With Blaine

What it is:

This is an upright Water Fall. There are a lot of variations with this maneuver.

Plane set-up:

Full 3D Throws

How to do it:

From a Hover, power out vertical. After the plane has reached 75 to 100 feet, pull power back give full up elevator and give a

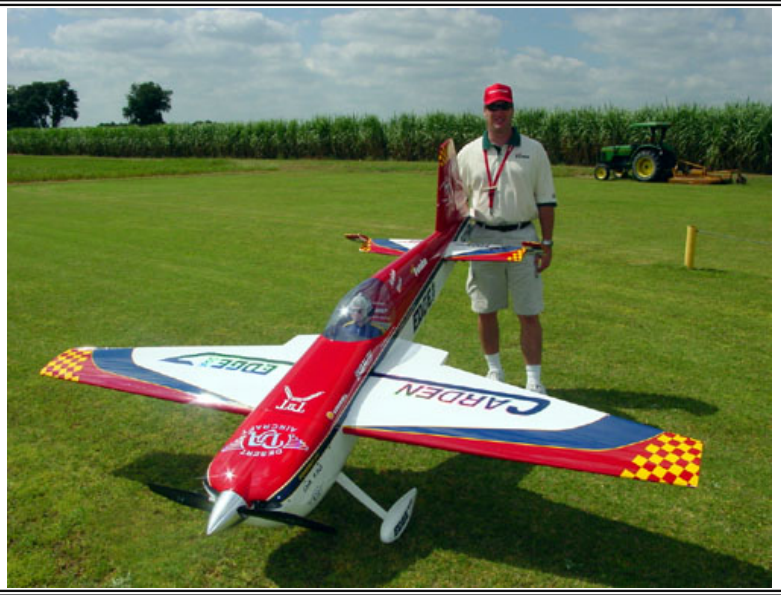
short burst of power. The plane will flip around into an Elevator. Let the plane fall back to the ground and power up and do it again. This maneuver looks best doing it two to three times making the loop smaller and lower each time.

Trickiest part:

Getting the plane to flip over into the Elevator position when you are doing it low.

Recovery:

Full power, flight out straight.



The Roller Coaster

With Blaine

What it is:

Plane is rocking back and forth from full up elevator to full down elevator diving straight to the ground.

Plane set-up:

Full 3D rates

How to do it:

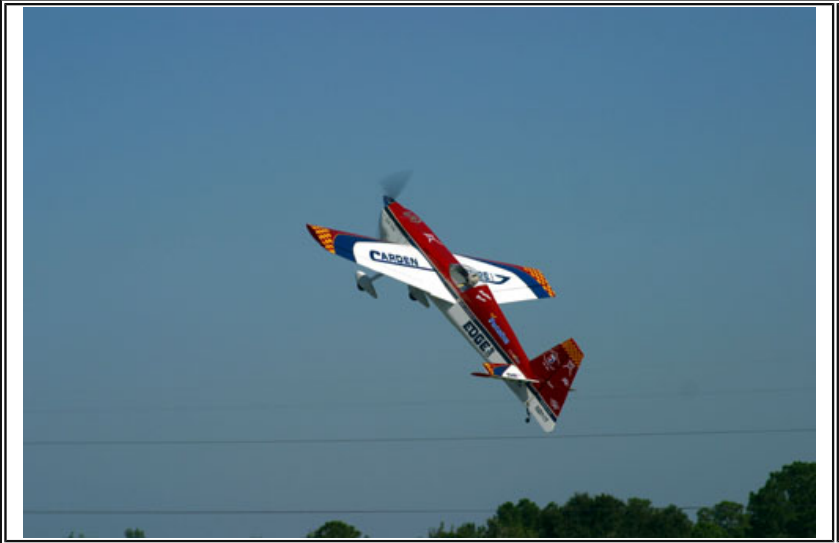
Take the plane up to 200 –300 feet of altitude. Bring the plane to a complete stall, as if you are doing an Elevator. This maneuver will be done with low throttle. You may need to give short burst of power to help control. Once you get the plane in an elevator you will be giving it full up elevator. You will then need to reverse the elevator input to full down. You will continue to reverse the elevator inputs pausing a little to let the plane get into either an upright or inverted elevator. Hold this till the plane reaches the ground. This is when you will decide to exit the Roller Coaster either in a inverted or upright Harrier.

Trickiest part:

Getting the timing down and keeping the plane straight.

Recovery:

Full throttle, and slowly release some elevator.



The Terminator

With Blaine

What it is:

Its when the plane is flying straight and level and then makes a 90 degrees dive straight down toward the ground. When the plane gets close to the ground, you pull up.

Plane set-up:

Full 3D rates.

How to do it:

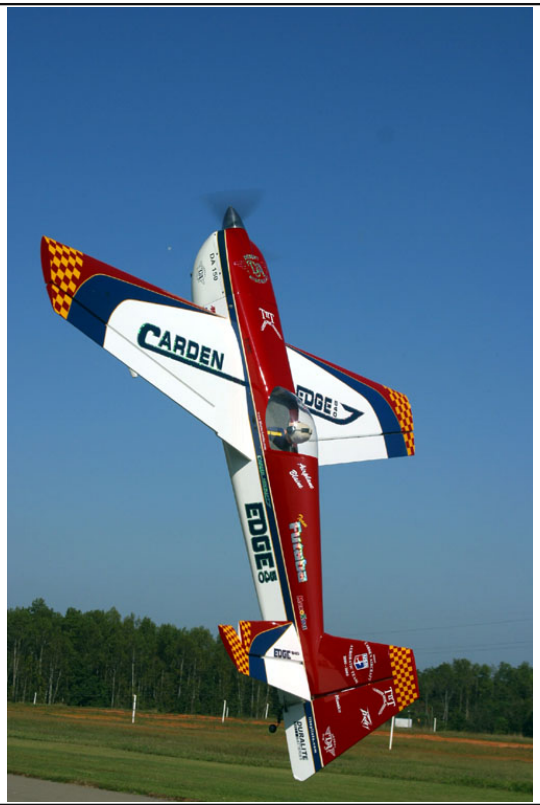
You will start out by making a straight and level pass down the runway. This maneuver can be done from a lot of different altitudes. To start out you need to be pretty high till you get your timing down. Speed is something else that you can play around with to do different variations. It looks better at a slower speed. After you have established your speed and altitude you will give the plane full down elevator. This will make the plane dive straight toward the ground. Let the plane come down to where ever your comfort level is. You will then pull full up elevator and add power. Once you have mastered the basics of this maneuver you can play around with different variations.

Trickiest part:

Getting your timing down to just when to pull out.

Recovery:

There is really no recovery from this. You either do it great or hit the ground hard.



The Wall

With Blaine

What it is:

The Wall or the Pop-Up: is when the airplane comes to a stalled stop into a vertical position from a horizontal flight path.

Plane set-up:

Full 3D Throws.

How to do it:

Enter from level flight into the wind with power off. Pull full elevator, neutral on the elevator as soon as plane is vertical. You can also enter from inverted which is one variation. Another variation is the Wall Slide, which enters going downwind... you, can actually maintain altitude for a few seconds without throttle while the wind slides the plane down the runway. You can also do a Wall slide with a twist. As the plane slows down in the vertical position, add rudder to make the plane spin around heading back into the wind.

Trickiest part:

Don't over rotate. The idea is a vertical stop.

Recovery:

Full power climb out.

I hope all these tips will help you in your quest to learn 3D.

Thanks

Blaine

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