

Product Review

**Precision Aerobatics
35% Extra 330L ARF**
by
Anthony Demarco.



Over the past 20 years I have been involved in many aspects of our hobby. I have flown everything from control line models (and got very dizzy), to helicopters, gliders, sports models, scale models, 3D models, competed in pattern competitions and I am now competing in IMAC in the Unlimited class. So I guess what I am trying to point out is that I have a pretty good knowledge about our aero modelling hobby.....ahh sport.....addiction?!

With the current generation of ARF kits on the market, the art of building a kit or even scratch building a masterpiece is slowly disappearing. I have scratch built my own and others designs, I have built kits and I am not afraid to say I hated it and I have never been good at it. Thanks to Pilot Ez (I think they were the maker of the first ARFs??) for starting the stampede of ARF kits to save modellers like me. I bought my first ARF kit in 1987 (a little electric called a 'Snark'...No lipos...no brushless...no speed control...no fun!!!) and I have built many ARF kits since.

Many of the sport ARF kits serve a purpose for most modellers but now that I am flying IMAC, the smaller cheaper ARFs just don't tickle my fancy. Yep, I may

be an aero modelling snob, but I am not interested in building or flying a model that doesn't fly straight and doesn't pull like a freight train.

THE PA330L

I have always liked the colour scheme on the Precision Aerobatics 35% Extra 330L (PA330L), the yellow, black, grey and white colouring will be easy to see on both sunny and cloudy days. That big 'Precision Aerobatics' on the bottom of the wing looks great too. The PA330L is a large model with a 2700mm (106") wingspan and a length of 2500mm (98.5") and is estimated to weigh 11.5kg (25lbs). The size, light weight and wing loading makes the PA330L a potentially perfect 3D airframe so I jumped at the chance to build and review one of these kits.

Right from the start the guys at Precision Aerobatics were helpful, friendly and efficient, these guys aim to please. I spoke to Shaun and Adad about getting one of the PA330L's and with a blink of an eye, I had three big boxes delivered to my door. Opening the boxes revealed one of the highest quality ARF's on the market. The

covering unlike other ARF kits was done correctly having the covering seams in the airflow direction with a 8mm overlap of colours, usually you will only find this on professionally custom or owner built models.....very impressive!

Mine came with the optional hardware kit, carbon wing and stab tubes, wing bags and helmet head pilot. The optional hardware kit comes with every item you will need to complete the model. It comes with a 32 ounce Dubro tank, petrol safe fuel line, T piece and fittings. The hardware kit includes beautifully made carbon fibre dual control horns for the elevator, rudder and ailerons. Also supplied in the hardware kit are nuts, bolts, pushrods and main wheels to complete the model etc and there is no going to the hobby shop for any additional bits and pieces.

I decided that I wanted to build the model as light as possible and the use of the optional carbon stab and wing tubes will lighten the overall weight of the model. For the guys who do not want to spend the extra money and are not worried about a couple of hundred grams here and there, the standard wing and stab tubes are made from quality aluminium although at the moment there is a special on the Extra and you get free carbon wing and stab tubes when buying an engine with the plane.

The wing, stab and rudder carry bags are custom made for the plane out of a padded waterproof canvas and are lined to keep your model in perfect condition These are beautifully made and are good enough to wear yourself, they even have handles!!! My wife thinks the wing bags are the best part of the whole model..... maybe I can sew them together and make myself a Precision Aerobatics jacket?!?! The helmet pilot is moulded out of fibreglass and is extremely lightweight. The helmet pilot can be supplied as painted or standard white, for the artists among us.



The Stig.



Ready for the gear

It is secured with the use of the supplied mounting plate which was simply screwed to the canopy floor.

Let's face it, it's not like us blokes to read a manual and I have built enough models to know what I am doing, but there is a well detailed manual that is certainly worth reading. Some of the building tips that are highlighted in the manual make you ask yourself 'why didn't I think of that?' This manual was written in Australia and the pictures are of Shaun's actual PA330L. I suggest you follow the manual which will result in a well built plane.

BUILDING

I started building the model by putting on the landing gear, wheels and wheel spats. This is an easy task and gets the model off the ground. Isn't it funny how putting the landing gear on a model makes it look almost built?! The next step was to glue in the Robart style hinges and seal the gaps with the supplied covering. For a guy who hates building, so far this wasn't too bad.

The canopy comes already tinted with the yellow painted around the outside. Not much to do on the canopy except glue it on. I gave the inside of the canopy and the covering a quick scratch up with some sandpaper and glued it on with canopy glue. Before you glue the canopy on make sure your pilot is firmly in place. I used the supplied mounting frame and some screws to hold down 'the Stig'. I assembled the model and found that the overall fit of the wings, stab and canopy frame was perfect. Did I mention the size of the model is impressive too.

The installation of the radio gear was straight forward with two servos used in each wing panel, one servo on each elevator and two servos on the rudder. I am using Hitec 5955TG servos with 24kgs of torque. These servos are bigger than needed for IMAC style flying, but the slop

free gear train and high torque is needed for the 45deg deflection of the large control surfaces used in 3D flying. These servos will be guided with the use of my Futaba 9ZAP WC2 and DP149 PCM receiver. In addition to the radio set up I am using an Emcotec 5 mini power distribution unit. The Emcotec Unit distributes 5 channels of your receiver to eight servos. This supplies each servo with constant current which is selectable from 5 to 5.9v. The power to the unit is supplied by two Precision Aerobatics 7.4v 2200mah Lithium Polymer batteries. The Emcotec unit is a simple setup

that will supply your servos with constant current needed for all your 3D and IMAC demands. They even supply a stand off vibration mounting system for the Emcotec unit. This mounting system will supply the unit with the adequate ventilation necessary for the required heat distribution. It is this impressive attention to detail that sets this model and Precision Aerobatics apart from their competition.

The final step is to mount the motor, canisters and fuel tanks. I have chosen a DA100 and BMB 60XL canisters from Desert Aircraft. The DA100 is a 100cc twin engine made in good old US of A. The motor weighs 2600g and puts out just under 10 horse power. I want to get the PA330L down on the deck so I want power and reliability. The last thing I want is to have the motor quit when I don't have the airspace to recover. You can get Desert Aircraft motors from the same place you buy this plane. I decided to use canisters because of the need to quiet my engine down due to noise restrictions at my local field and I will also benefit from an increase in performance. The BMB 60XL canisters were also chosen because they are only 60mm in diameter and the opening for the canister tunnel was a total of 130mm.

Mounting the engine was extremely easy with the help of ply laser cut standoffs. Connecting the throttle to the throttle servo



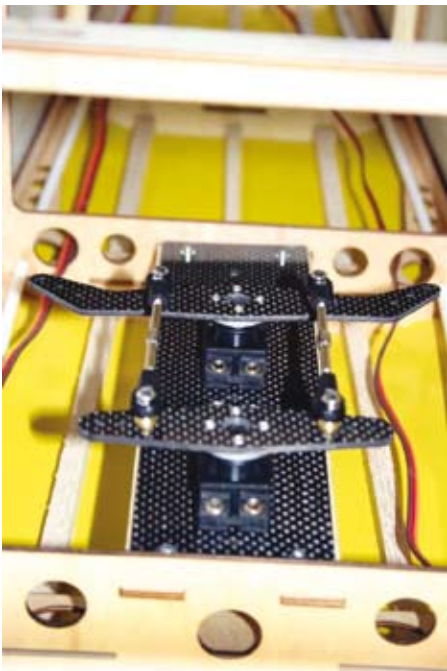
Twin cylinder
Desert Aircraft DA
100cc engine

was also easy using the supplied carbon pushrod, I simply glued a ball link on either end of the push rod and connected it to my servo and throttle. It doesn't get much easier than that. Mounting the canisters proved to be a little more difficult as the room inside was getting a little cramped. A additional tank tray designed to raise the tank above the canisters was supplied and I cut out the existing tank tray and made up a former out of light ply to hold the canisters in place.

I also was supplied a header kit to make up custom headers to fit the PA330L. With some cutting and silver soldering by Chris Swain, the headers were a perfect fit. Final mounting of the motor was done using 6mm steel bolts and blind nuts, I then put nylon lock nuts behind the blind nuts to stop any possible chance of the bolts coming loose. To complete my engine package I am using a Precision Aerobatics 4.5in carbon spinner and a 28/10 Mejzlik prop.

I should probably add that at this stage I decided to reinforce the fire-wall. Shaun does recommend that you fibreglass the outside of the firewall to reinforce it. I went one step further and used two 100mm light aluminium angle and bolted it to both sides and front of the engine box. That ain't going anywhere! To mount the cowl I followed the instructions and glued in the ply retaining ring, this enables you to attach the cowl with bolts into blind nuts which are accessed through the canopy hatch. The ring is reinforced with the use of fibreglass cloth. There is a bit of fiddling to do here, but the result is worth it.

It is an Australian Scale Aerobatics



The Precision Aerobatics twin servo rudder pull pulley system.

A header kit for this engine combination is available. BmMB 60 XL canisters really pull the noise level down and increase the power.



Association (ASAA) requirement that all scale aerobatic aircraft participating in Australian IMAC competition must have a second means of engine kill via the transmitter. This requirement is obviously directed towards petrol motors. Options for second engine kill are servo operated choke (a servo cut out is provided for by Precision Aerobatics) or an ignition kill switch. I chose to use a Smart Fly Optical kill switch, which can also be purchased from P.A This kill switch goes between the battery and ignition and is operated by a spare channel on your radio. I then dry assembled the model to check the centre of gravity.

Because I used canisters I expected the model to be nose heavy, with careful placement of the radio gear inside the model I found the centre of gravity balanced according to the recommendations. The balance point was at 220mm from the leading edge measured at the root rib.

My radio set up is very close to that recommended in the instructions. I have the model set up with high rates for 3D flying and low rates for IMAC flying. Those big PA carbon fibre servo arms are giving me huge deflections. It had only taken 4 good days in the workshop to have the PA330L ready for flying. I guess the crappy weather was good for something.

Finally the test flight day was here, and the weatherman proved to be right for a change, the predicted gale forced winds were still here.....bugger!

FLYING

The next day (a Monday of course) the winds were gone and the sky was blue. Work is a dirty word on days like this, so I went flying. A couple of phone calls and a bunch of mates were at the field to lend a hand. A couple of photos were taken and it was off to the flight line to start the DA100 up and shove the PA330L in the air. The

brand new engine started for me like we had known each other for years. I ran the motor to check its tune. Sounds good to me.

The Extra was pointed into the wind, I opened the tap on the big engine DA100 and it flies. I left the climb out on a shallow angle for about five seconds, reduced the throttle and started to do a rolling circle to turn the model 180 deg. Not bad. The rest of the first flight consisted of vertical up lines, down lines, rolls, snaps, spins, point rolls, inverted flight, knife edge, a so so rolling harrier, flat spins, the most awesome water fall you have ever seen, a blender, a bit of hovering and a wall.

FLIGHT BREAKDOWN

On to the important stuff, the flying. I have broken down the first couple of flights into the individual manoeuvres I did in more detail. The PA330L is easy to fly through any 3D manoeuvres and is graceful and forgiving. Kind of like a big 3D trainer. The model was controllable in the Roller, but with deflections recommend for low rates and the rearward CG, it was way too twitchy. That is not to say the roller was hard to do, but took a bit more concentration. Getting used to the model would help a lot too. The vertical performance with the DA100 was unbelievable. I have flown many 50cc, 100cc and 150cc sized planes and the power in this light airframe is awesome. Love me D.A. The up lines require a bit of right rudder and the down lines need a bit of down elevator. This is easily mixed in your computer radio.

The rolls and point rolls were very good, but the model does need a hint of differential for the model to roll axial. An eight point roll from one end of the sky to the other was not a problem, but could be made easier with a bit of mixing. Snaps start and stop, now! Light wings are the go. Doing multiple snaps in the upline was very easy and unloading the snap helped a lot to keep

the model on track. Spins are nice and easy but I did find they are a little hard to do in the wind. The PA330L just floats and floats and.....

The model just seems to lock in while in inverted flight. Cruising across the sky inverted, the model just sits there making the pilot look good. The recommended CG will make the PA330L fly an inverted 45deg up line without any down elevator. Knife edge flight is very easy and applying full rudder will just make the model climb into a knife edge loop. A tiny bit of up elevator needed to maintain heading, but that is easily mixed into your computer radio. High alpha knife edges down the runway are sweet.

The rolling harriers were a bit high and the timing was wrong on the first flight. A couple of flights later had me easily doing rolling harriers across the sky. I think the PA330L made it look like I can do rolling harriers ?

Flat spins are flat as a tack. I had to release some of the elevator to stop the model from wanting to go back up. Not really much to do except watch. The model stopped the instant I let go of the sticks. Imagine putting a rod through the wing tip and out the other wing tip, get two people to hold on to the rod while the model is spinning end over end. I don't think the model lost any height during 4-5 rotations. That is the Waterfall and Blender. The blender wasn't violent at all and easy to do. There is something about blenders that make the crowd go....ooohhhh

My mates in the back ground were my good conscience on this one. I started to hover the model and in the background I hear "It is a new motor!!!".....yeh your right....damn it! Later flights had the PA330L hovering with ease. There is



How that for a flat spin. Now that's flat.

heaps of power with the DA100 to pull the PA330L out of the hover. Torque rolling is very easy to maintain and hold. As for the Wall, I just did tell them I was going to do one, bam! The big Extra stopped all forward speed and hung there, cool. There was no sign of rolling off to one side or the other, it was like it hit a 'wall'. The model also does the coolest Knife edge spin, often call the Hanno Screw. It will fall on one wing tip and stop the instant you let go of the sticks.

MIXING:

With these settings my PA330L flies hands off in an upline and downlines plus knife edge flight.

7% up elevator with rudder application;

2% down elevator at low throttle;

A hair of right rudder with full throttle; and 60% expo on all surfaces.

To give you an idea on how easy it is to fly, I gave my brother, who hasn't learnt to land yet, a fly. He did he's first positive snap roll with the PA330L. A couple of others from 3 to 20 years experience got to steer the

PA330L around the sky. All agreed that it was easy and great to fly.

HITS AND MISSES

Hits: Well thought out design. Excellent covering application. Light and straight airframe. Easy to see in the air. Great 3D airframe.

Misses: Covering gets wrinkled very quickly. Nothing an iron won't fix. Canister tunnel is too small.

CONCLUSION

Like I said in the beginning, I am not a builder and do not really enjoy it. I didn't mind building the PA330L because everything fits and the supplied hardware was picked for a reason. There were no major problems and I would think anyone with a couple of ARFs under their belt could build one easily. I would recommend that a novice get help from an experienced giant scale modeller just to point out the do's and don't's.

If you are considering getting into a 35% aerobatic model that will do every 3D manoeuvre you can think of, I can recommend the Precision Aerobatics Extra 330LL. PA website (PrecisionAerobatics.com) features about 4 videos showing different set ups and different flyers (including myself) and I recommend watching!



Hovering, seems like just above idle.