

## Product Review

**CM Pro  
Extra 330L ARF  
DZY 48 twin cyl engine**  
by  
Les Marriner.



A company that I have seen expand their range, and are at the forefront when you speak of top quality and value for money, the China Model Productions (CM Pro) certainly rises to the top. At a time where we all have witnessed our athletes break records and attain personal bests, CM Pro really has raised the bar when presenting their latest and largest version of the Extra 330L.

Aimed at the serious scale aerobatics modeler, the Extra 330L measures in at 1960mm wingspan, has a fuselage length of 1790mm, weighing in at 6.5 kgs when fitted with a DZY 48cc flat twin, spark ignition petrol engine. The fiberglass fuselage and fully built up flying surfaces come fully painted, decaled and sealed with a clear coat finish. Quality and accuracy of the product is truly remarkable, and I believe that there would only be a handful of professional aero-model builders in Australia that could come close to producing a model of this standard. When matched to a serious power plant of the recommended 40cc – 50cc range, you end up with a very exciting aircraft that has truly awesome performance and weighs in under the 7 kgs

limit for heavy model registration. An APC 20 by 8 propeller completes the engine power train.

As this is my first review of a large model using a spark ignition power plant, it is my intention to pass on the lessons that I have learnt with this project. I am sure that there are a number of aeromodellers out there who are considering this type and size of aircraft for their next project. How does it fly I hear you ask? It flies just great and it has the performance to match, but more on that later.

The DZY 48cc flat twin petrol engine that I used to power the review model. DZY (Tianqi Aircraft Motion Apparatus Co. Ltd.) also produce a 24cc single and a 100cc flat twin in their range for release here in the near future.

The Extra 330L comes supplied as seven fully painted body parts consisting of the fiberglass fuselage which incorporates the vertical stabilizer, vac formed canopy and canopy floor, fiberglass cowling, fully built up plug-in wing halves, built up horizontal stabilizers and elevators, and a built up rudder. A very comprehensive accessory package is also supplied. This includes a

carbon fibre wing tube and undercarriage legs, wheels and wheel pants, fuel tank, point hinges that incorporate the control horns and all the nuts and bolts required to assemble the airframe. An eleven-page easy to read instruction manual covers general assembly procedures, recommended centre of gravity and control through measurements.

### PREPARING FOR ASSEMBLY

The Extra 330L is a big model that comes fully painted and decaled. The finish on the parts is truly outstanding and the only way to assemble the aircraft without causing any hanger rash is to clear the bench and cover it with some form of padded protection. This way you give yourself a fighting chance to present your model as something to be very proud of and in a way that CM Pro intended.

Plan how you can best achieve the finished article to avoid making simple and frustrating mistakes. Before I commence a new project, I allocate all the radio gear that I will require, connect it all to the receiver then allocate the model a memory setting into my transmitter. By resetting the program on the transmitter, all the servos are reset to zero. This ensures that when you get to the stage of installing the radio gear in the model, no unexpected servo travel should occur, thus eliminating possible servo movement that could result in damage to the servo gears.

### WING ASSEMBLY

The main wing halves come fully covered, decaled and clear-coated, only requiring the installation of the ailerons servos and the hinging of the ailerons to each wing half.

Very robust point hinges are supplied and are easy to install into the pre-drilled holes. The control horns are incorporated into one of the hinges for each aileron.



No covering film the Extra is fully painted.

When glued into place with epoxy, you end up with a very strong and attractive control horn installation, with no visible horn mounting plates. It is imperative that the point hinges are installed so the hinge line is parallel to the leading edge of the ailerons and the easiest way to control this is to bend the hinges to 90 degrees after gluing into the ailerons. You should end



Ensure the hinge line is parallel to the hinge line is to bend them up at ninety degrees after glueing.



The aileron horn is integrated into a hinge point.



Allow yourself a 5mm undercut.

up with the free end of each hinge being at 90 degrees to the leading edge; ensuring that you don't end up with hinges that bind during flight.

The aileron servos are mounted into flat moldings that are fitted into recesses in the underside of each wing half. When preparing the servo cutouts, allow yourself a 5mm undercut inside the servo bay. You can then remove the cutout piece of covering, which can be used to test what heat range can be used to seal the covering into the servo mount cutouts. I found that a medium heat is all that is needed to do the job and when the servo mount is inserted into the hole, you end up with a neat job that will last the life of the airframe, as you

have eliminated any possibility of fuel or wind getting under the covering.

The 25mm diameter carbon fibre wing tube is a slop free fit into the preinstalled mounting tube in the fuselage. Two 4mm bolts position and fix each wing half to the fuselage. This method of wing fixing is strong and positive, however I go one step further and use a 25mm servo disc as washer for each 4mm bolt. This adds a lot of strength to the wing fixing, as the loads on the sides of the fuselage are spread over a larger area.

#### FUSELAGE ASSEMBLY

Once again, it is wise to plan your sequence of assembly and while your fuselage has no appendages hanging off it, this is the perfect time to install your



elevator servos into the mounts at the rear and on each side of the fuz. This process is very straightforward and well designed. I decided to use an SJ Y lead that contains a reversing circuit for one of the servos. This small item costs about \$20 and makes life very easy when using a separate servo for each elevator half.

The undercarriage fixing is a simple mounting job that involves drilling three 4mm locating holes for each leg and fixing with the supplied 4mm bolts and blind nuts. I continue on and complete the undercarriage by adding the wheels and wheel pants. You end up with a fuselage that is now self-supporting because of the undercarriage and unlikely to sustain any

hanger rash. The supplied axles consist of two 4mm by 50mm bolts which would work fine, but it is my preference to use 3/16th DuBro axles (65mm in length). The extra length allows the axle to protrude through to the outside of the wheel pants by about 4mm.

By placing a 6mm length of fuel tubing over the end of the axle and running inside the pant, you give extra strength and support that prevents the pants twisting and eventually fracturing when landing on grass landing strips.

#### CANOPY ASSEMBLY

The first job here is to trim the canopy and canopy floor to the cut lines. I use a pair of Weiss tin snips for this job by taking small cuts and proceeding with care. The floor and canopy are glued together using a minimum spread of builders silicone sealant. I used about 20 wooden clothing pegs as clamps and set this aside to dry over night.

If you are accurate with your cutting to the cut lines, the canopy and floor fits the fuselage opening perfectly. It is attached to the fuselage with six 2.6mm by 12mm screws, using a 2mm length of silicone fuel tubing as a home made spring washer on each screw. This allows the screws to be tightened, but not over tightened to the point where it eventually fractures the canopy material.



If you follow the cut lines the canopy is a perfect fit.



### ENGINE MOUNTING

A pre-assembled engine-mounting box requires mounting to the firewall and any modifications to the box will depend on your choice of power plant. The supplied box has been prepared for a 45 cc petrol engine, however as I am using the flat twin, I had to make some modifications to cater for the twin exhaust pipes, which protruded into the box area. This is a simple enough task to do, but did weaken the structure so to rectify this situation I



After assembling the engine mount box I let gravity do the work when fitting the cowl.



This original ignition installation had to be changed by separating that wiring from the radio battery pack wiring.



mounting bolts. It may sound like a lot of work, but in reality if you follow this procedure you end up with a top job, and your fellow club mates will wonder how you achieved such an accurate engine mounting; unless they have read this article also!



glued a second skin of 4mm ply around the front of the box for a distance of 50mm rearward from the engine mounts.

After attaching the engine box mount onto the fire wall as described in the instructions, you need to be able to support the engine onto the box mount, then trial fit the cowl so the thrust washer on the engine exits the cowl centrally and in exactly the correct position. I let gravity work for me and I use the following procedure to attain a very accurate and pleasing result. I firstly support the fuselage in the vertical position with the firewall uppermost, by using my workbench and whatever frame work that I require to safely support the airframe (see photo). Trial fit the cowl, which will sit into the recessed area that surrounds the firewall, then remove the cowl and rest the engine, (minus its exhausts pipes and carburetor) on the front of the mounting box. Replace the cowl into the recessed area, which will keep the cowl fully supported. You then carefully position the engine, ensuring that the engine shaft exits the cowl exactly where you want it. The next step is to remove the cowl again making sure that the engine is not disturbed. Mark the position of the four engine mount holes on the front of the engine mounting box and drill for the 5mm

### COWL MOUNTING

The cowl is mounted in its predetermined position, using eight 2.6mm by 12mm screws using the same system as mounting the canopy. The cut outs to cater for the exhaust outlets and the spark plug leads will depend on your choice of engine. The front-end





Depending on your choice of engine the cowl may need to open to clear the spark plug leads.



Close ups of the modified throttle linkage for a petrol engine. If using a glow motor the servo can be mounted at the firewall under the cowl. With an ignition system the servo must be mounted inside the fuselage and all radio wiring routed separately.



air intakes are completed at the factory, but to ensure that there is ample cooling air to exit the cowl I removed a section 140mm wide and 120mm deep, measuring from the rear of the cowl.

This gives very effective engine cooling and allows the cowl to

be removed and re-fitted when required, without removing any engine parts. Even though this seems like a large cutout, in reality it isn't even noticed during flight or when at rest in the pits. Any other cowl alterations will depend on your power plant.

#### THROTTLE MOUNTING

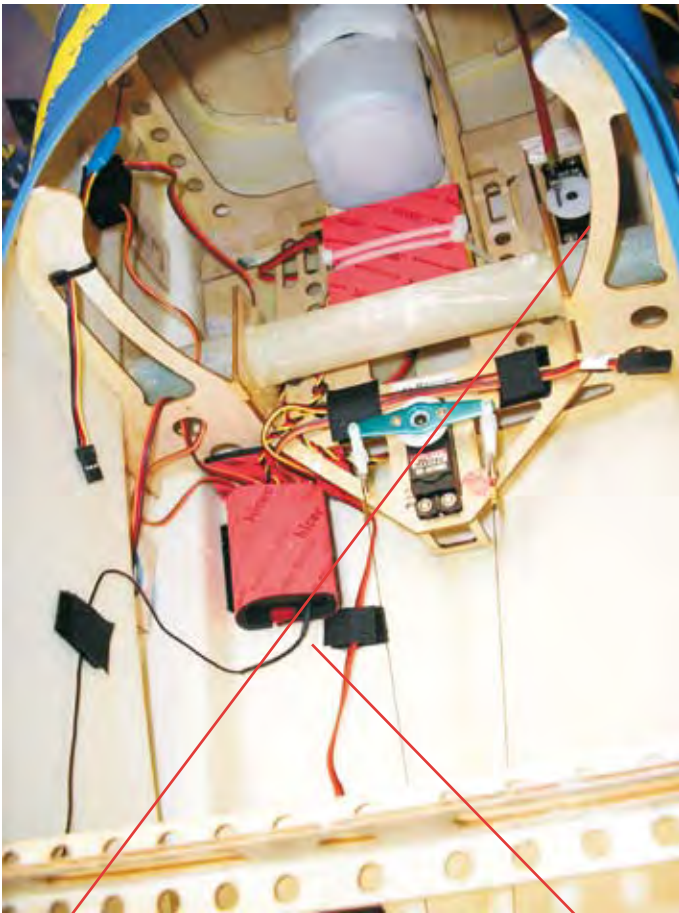
The instructions depict the throttle servo being mounted in the engine bay, on a supplied ply mount. This system of mounting and location of the servo nearly ended in tears (mine) on the test flight. I conducted range checks with the engine operating at idle and got quite good results. Range distance without the engine running was outstanding. The one thing that I failed to check was the range when the model was pointing straight at me, placing the engine and all its electronic wizardry between the PCM receiver and my transmitter. I also made the mistake of routing the throttle servo lead through the same pre-made access hole in the firewall that I used for the fuel lines and separate battery supply lead to the electronic ignition. It operated fine when the engine was at idle, however what was about to happen, could have been very tragic.

The model was taxied out and the throttle was opened smoothly. As the model reached a very safe flying speed, the elevator was brought into play. As the test pilot, my main focus was on keeping the model on track and gaining sufficient air speed for take off. I was unaware that the aileron servos were receiving massive interference via the throttle servo lead. As the model left



Drilling the spinner backplate.





Throttle servo relocated inside the fuselage. As per the radio system instructions the receiver antenna should be kept away from all wiring.

the ground it instantly rolled right to knife-edge, at a height of about 2 meters. My immediate reactions saved the model from destroying itself and I managed to regain some form of control by reducing the power. I flew the remainder of the circuit, which involved two further uninitiated surprise roles and several major glitches, to a point where it was safe to land.

The relief I felt to have my pride and joy safely on the ground without any damage was unbelievable. One of my club mates commented, "That was great Les, I recon that you have just performed your personal best and I wouldn't bother buying a Tatts Lotto ticket this week." Anyway, if my experience saves one of your models from total destruction, then this review article has done its job.

I have since relocated the throttle servo to a position well inside the fuselage and it is connected to the throttle via a cable, with no metal-to-metal joints linking the throttle arm to the servo cable. All the electronic components that are required for the engines opera-



Safely back on Terra Firma.

tion are now mounted in the engine bay and at a distance of 35cms from the receiver.

#### FLIGHT TEST (TAKE TWO)

The following weekend came along and I was quietly confident that this was going to be a very pleasant experience. Starting the DZY 48cc engine is quite easy using the factory recommended procedures. Basically the choke is fully closed and the engine is cranked over by hand, which draws the fuel into the crankcase until the engine sounds wet. The choke is fully opened, the throttle set on idle and the ignition is switched on. A warning beep confirms that the ignition system is now armed and ready for starting. The propeller can be activated by your preferred method. I personally hand start my engines, but a quality electric starter will also do the job.

Big models are great to fly and this big Extra 330L is no exception. The (take two) take off was a pleasure, with only minimal right rudder being used to keep it on track. The tailplane lifted and the model reached flying speed at about half throttle. Introducing elevator saw the Extra rotate and start climbing out with complete stability and no need to alter any of the flight trims for hands of flying. Loops, rolls, inverted flight and knife-edge manourvres can be performed with complete confidence.

One of the most important flight tests is to perform a stall, at a safe altitude. A climb to 400 feet saw the Extra turned into wind, throttled back to idle and a gradual application of full up elevator. The ensuing stall was a non event, with no wing dropping as the Extra simply stayed pointed into wind and started to mush forward whilst losing height in a very controlled manner. I then performed a further test at altitude and into wind to see how slowly the Extra could be flown to replicate a landing approach. Again the Extra remained solid, showing no tendency to drop a wing, which gave me full confidence that I could perform the landing at quite a slow speed.

#### SUMMARY

The CM Pro Extra 330L is certainly the most impressive scale aerobatic model that I have had the pleasure to fly. It is capable of performing very scale like aerobatics, and could be safely flown by the intermediate skilled pilot. The high gloss painted finish that has been achieved by the factory, will take a lot of beating and members at my flying club have been truly amazed at the finish quality of the model.

The DZY 48 cc flat twin petrol engine behaved impeccably during the flight and makes for very economical operation. The horizontally apposed twin setup ensures very smooth running and idling: in fact I would go as far as to say that it runs as smoothly as a large capacity glow/methanol engine. It will idle safely at 1700 rpm and was pulling a static 17,500 rpm whilst being restrained by a club mate. The factory recommends running in the engine using a 25:1 petrol and mineral oil mix, then going to a 40:1 synthetic oil mix for general flying. As no nitro is required as an additive for the petrol, each 10-minute flight equates to fuel cost of approximately \$1. The DZY electronic ignition system ensures smooth engine running and user friendly starting.

If you would like any further information regarding the CM Pro Extra 330L or the DZY 48cc petrol twin used in this review model, I am happy to give you my email address which is [marriner@alphalink.com.au](mailto:marriner@alphalink.com.au) Regards, Les Marriner.

The CM Pro and DZY are distributed to hobby shops by Model Engines Australia. Tel 03 8793 5555. [www.modelengines.com.au](http://www.modelengines.com.au)