

## Product Review

### CM Pro Giles 202 ARF by Les Marriner.



The CM Pro Aerobatic Giles 202 / 140 ARF certainly is a mouthful to say, but believe me, it is a lot of aeroplane. The CM Pro Company is a world leader in the field of ARF Scale Models and the "Giles 202" is no exception. It is very impressive model with a 72 inch (1800 mm) wingspan and fuselage length of 73 inches (1820mm). The recommended engine range is from a 108 - 160 2 stroke or the 120 - 140 4 stroke.

My review model came out at 4.850 kg with my OS 160 FX up front, swinging an 18 X 8 APC propeller. It is constructed from light ply, balsa wood, fibreglass and carbon fibre. It is covered in a durable polyester heat shrink material that is user friendly and can be re-shrunk or re-sealed if the need ever arose. The quality of the model is outstanding and it delivers 100% in overall appearance, flying characteristics, build quality and accuracy, and I sum it up as "bloody beautiful."

#### WHAT YOU GET FOR YOUR BUCKS

The fuselage is fully built up from laser cut ply formers and balsa wood sheet and strip wood. The fibreglass cowl comes fully painted with decals, and the fibreglass top hatch and moulded canopy are similar quality items. The rudder, tail plane and main wing halves are fully built up balsa



*Quality is apparent straight out of the box.*

and ply construction, covered with film. The main undercarriage is constructed in two halves from carbon fibre, which is finished off with two fully detailed fibreglass wheel pants. It also includes a very comprehensive accessory pack containing hinges, pushrods, fuel tank, wheels, control horns, engine mount and nuts and bolts. The main wing halves plug into the fuselage, using a carbon fibre tubular spar. The "Giles 202" is a true 95% ARF that goes together quickly, without any fuss, fantastic value for money and best of all, is an absolute delight to fly.

#### PREPARING FOR ASSEMBLY

The "Giles 202" is a big model that will need some decent workbench space to assemble. My work area consists of a 9 X 3 ft. flat top bench that is cleared of everything and vacuumed. When commencing a new ARF project, I cover the bench area with two beach towels. With this type of preparation, you are giving yourself a fighting chance in the war against the dreaded "Hanger Rash".

Before you ask the question, I shall give you the answer, "No I am not suffering from any form of behavioural disorder, I simply like presenting my models in the best possible condition." CM Pro has done its part by supplying a model in pristine condition, so I believe that it is worthwhile doing our bit in the assembly stage.

#### WING ASSEMBLY

The main wing halves fully covered and trimmed, only requiring the installation of the servos and aileron hinges. CA hinges are supplied and each surface is prepared with the hinge slots. The wing spar is a carbon fibre tube, which is very light and strong. The fit into the wing panels and fuselage tube is perfect. Four 4mm metal screws retain the wing halves, from inside the fuselage into captive nuts that are preinstalled into each wing half. The

aileron servos are flat mounted in each wing half, and are positioned half way along each aileron. This gives very accurate aileron control and no aileron twist during high stress manoeuvres.

For all the flying surfaces I used Hitec HS 475HB servos. These are ball raced, rated at 5.5 kilograms and are great value. I was also very impressed with their accurate centring and sub trim adjustment qualities. You can now put the wing halves away in a safe place as the job is done.

**Building Tip:** When using glues or resins, think ahead and try and pre-empt what could go wrong. If I am about to use epoxy glue or resin, I make sure that I have the mentholated spirit and a rag handy for any urgent clean ups. Likewise if I am using thin CA glue, I ready myself with a tin of auto thinners and a rag. The last thing that you need across the covering of your pride and joy is run of CA from installing the aileron hinges. When dealing with all these types of mishaps, the speed of the cleanup is the key to success.

#### FUSELAGE ASSEMBLY

The Giles 202 comes with a schematic plan to aid the assembly. This is quite satisfactory and very easy to follow. I spend a little time looking at what needs to be achieved and what order of assembly will best suit me. With the Giles 202, I decided to fit the main undercarriage / wheels / wheel pants



*Mount the servo, hinge the ailerons then set up the linkages and the wing is done.*

first. This is easily achieved and it sets you up with a stable fuselage to work on. I followed this up with fitting the rudder and tail wheel assembly, for the same reason.

I then fitted the fuselage hatch which is constructed from fibreglass and colour matched to the covering. The hatch is fixed to the fuselage with two spring-loaded pins at the rear (pre-installed) and two dowels that need locating at the front.



**Building Tip,** I find the simplest way to achieve an accurate installation here is by using wood-dowel point markers. Drill two 1/4 inch holes in the front surface of the hatch, fit the two dowel point marker into the hatch and then place the hatch in position, pressing forward into the front bulk head. This gives you two drilling point marks to match the hatch dowels. Fit the dowels and the hatch is ready for the canopy installation.

I trimmed the canopy to the cut line using medium sized scissors, taking small cuts around the front and rear curves. It can now be fitted to the hatch using the supplied 2mm X 8mm self taper screws. I used five screws down each side and one at the front and rear centres. This is achieved by drilling 1mm pilot holes through the canopy and hatch, then removing the canopy and enlarging the canopy holes to 2mm. This will prevent the canopy from splitting when the screws are installed. The hatch can now be finished off by running a

*Accurate aerobatic manoeuvres are much easier to achieve if the control system is up to the job. Short and direct linkages with one servo for each surface produces very positive control.*



smear of silicone sealant down each side where the hatch seats onto the fuselage side. Smooth out the silicone with your wet finger (dipped in water or spit), and you are aiming for a smooth run, approximately as thick as a sheet of paper. This precaution guards against the hatch rattling or drumming where it sits on the fuselage sides during flight. Set the hatch aside to let the silicone dry, as it is not needed again during the assembly.

#### TAIL PLANE ASSEMBLY

The tail plane halves are built up balsa wood ribs and sheeting, that are located by an aluminium central tubular spar and two locating dowels. The fit between the inside rib and the fuselage is again spot on, so all that is required now is to remove the covering from the fuselage and gluing the tail plane to it, using two part epoxy. Clean up any excess using mentholated spirit on a rag. The accuracy of the fit will ensure an accurate installation. Each elevator half can now be fitted using the CA hinges that are supplied.

The rudder servo is installed by removing a section of the fuselage rear bottom, which exposes the pre-installed servo mount. CM Pro supplies an aluminium servo extension arm that is bolted to the Hitec servo arm. This protrudes from each side of the fuselage and is linked to the rudder control horns with two metal

pushrods. This results in very positive and accurate rudder control.

Each elevator is controlled by its own servo, which is mounted just forward of the tail planes leading edge. Elevator servo mounting plates are pre-installed and simply require the removal of the covering with a knife. If you are using digital servos, one will need to be programmed to run in reverse. As I used standard directional servos, I needed to achieve a servo reversal and this can be achieved by introducing a servo reversing lead to one of the elevator servos. To complete the servo installation either use a Y lead or a free mixer on a computer set.

I decided that I would fit my OS 160 2 stroke to the Giles 202. It was originally fitted to a 72 inch CAP 232 that weighed approximately 1 kilogram heavier than that quoted for the Giles. It was a real powerhouse in the CAP, so I was looking forward to the performance in the Giles. The firewall has the required right and down thrust built in, and there is a vertical and horizontal line shown where the prop shaft should be lined up with, for the prop shaft to centrally exit the cowl. The measurement range for fitting the cowl can range from 120mm to 140mm's from the prop drive washer to the centre of the firewall. This will depend on which power plant that you use. I side-mounted the OS 160 and fitted my own design can muffler. There are a



*The aluminium servo arm extension bolts on to give a straight run to the large and powerful rudder.*

*If you are interested in endless vertical performance the Giles 202 with an OS 160FX has it*





*Half throttle take off on the first flight then it got the better of me and I opened the tap and went vertical to 500 feet.*

number of commercially available in-cowl mufflers, the Bisson 160fx is one that should be suitable. The fuel tank was installed using three lines, the first being the clunk line to the carburettor, the second going to the top of the tank and feeding onto the muffler for tank pressure.

The third is the fill line that goes to the bottom of the tank and is capped off during engine operation. This line allows you to empty the tank at the conclusion of flying for the day. The only remaining job is to fit the throttle servo and pushrod connection. The servo mount is preinstalled and is a simple installation. Avoid any metal to metal connection between the pushrod and the throttle arm, as engine vibration can cause radio noise and interference.

#### CAWL INSTALLATION

The OS 160 required some cowl removal around the engine head fins. This ensures good cooling and gives easy access to the glow plug for engine start-up. The needle valve and exhaust exit also require removal of some cowl material. This will depend on your choice of power plant, however my golden rule is, to give the cowl a generous amount of venting exits as cool engines run happier, last longer and provide more power. Again, I accomplished the removal of cowl material by drilling a series of 5mm holes and finishing it off with my drum sanding bit in my Dremel drill.

Control Throws and Centre of Gravity. The schematic plan does not give any indication of recommended control throws for any of the flying surfaces. Possibly because this product is intended for the more experienced pilot, my model was set up with mild throws to start with and I haven't seen the need to change them.

- Ailerons - 25 mm up and down with 30% expo
- Elevators - 30 mm up and down with 20% expo
- Rudder - 70 mm left and right with 60% expo

The Centre of Gravity came out as per the plan, without the need for adding any extra weight to the airframe. Again this would depend on your choice of power plant.

#### FLIGHT TEST

The review model was finished within eight days of delivery, which involved a concerted effort on the weekend and two hours of tinkering after work. The finished model was taken to my clubs monthly meeting and it generated a lot of interest from the members present. I announced that I planned to conduct the test fly on the following morning at our club field at Lilydale, Victoria. Test day started off quite windy and overcast with the forecast of late rain. I decided that the test needed to go ahead and after, all the Giles is a big aircraft with a generous amount of power

available. Seven club members arrived to give me support and after an engine tune-up and range test, the model was taxied out on the strip and turned into wind. The Giles was accelerated and tracked straight as an arrow. A gentle take-off and climb out was achieved at just above half throttle. I am afraid that the moment got the better of me and I pulled to vertical and opened the tap. The combination of the OS 160 and the Giles 202 was very impressive as it tracked vertically without the need for any rudder input. It has limitless vertical performance and at about 500 feet, I backed off the throttle and performed a very controlled rudder stall turn. After that rush of blood, I thought I had better fly some conventional circuits and land and conduct an airframe check. This is a good habit to get into when testing any aircraft for the first time.

Everything checked out so I decided to hand the transmitter over to fellow club member Damien Mould, who put the Giles 202 through its' paces. I respect his opinion greatly and I knew he would give me an honest appraisal. He performed some very impressive aerobatics that included slow rolls, four point rolls, Cubans, stall turns and very accurate inside and outside loops. He remarked that the Giles 202 was the closest thing to an all out pattern-ship that he had ever flown.

What really impressed all those present, were several knife-edge passes at half throttle, which were performed with rudder input only. The stall was very predictable and nonviolent, as were the spins that came out on command when the sticks were neutralize. Landing was a nonevent, showing no tendencies to drop a wing when the model was slowed up during the final flare out before touchdown.



#### SUMMING UP

The Aerobatic Giles 202 -140 ARF is the best and most attractive scale aerobatic aircraft that I have ever flown. The power of the OS 160 is a perfect match to the Giles 202 and it allows the pilot to perform unlimited aerobatics. Assembly time is minimal and the kit quality is outstanding.

If you are considering purchasing this aircraft, please feel welcome to contact me via my email address at [marriner@alphalink.com.au](mailto:marriner@alphalink.com.au). I am more than happy to clear up any queries you may have or give you general advice regarding our hobby/sport.

Regards, Les Marriner