quock 3

Try 'fun-flying' the Italian way with this easy to build .30 size profile stunter designed by Giuseppe Ghisleri

I first saw a "Fun-Fly" model some years ago when a fellow modeller brought to the flying field a "Stunt Wagon" built from a Florio Flyer kit. I was interested in its strange and unusual look, but wasn't really impressed. Some months later the same friend flew a new Fun-Fly model, the type now commonly seen, with a stick fuselage. While this model had some impressive flying characteristic, I did not like the advice I received when handed the transmitter: *"Use full throttle only while climbing to avoid control surface flutter."* I asked my friend for more information on this kind of model and received a bunch of American modelling magazines.

Then I began to understand what a "Fun-Fly" model really was and what it was built for. To be honest, I got no kick from them at all. I don't see any fun in flying a model whose only task is to make as many "touch and goes" or "loops and rolls" in as low a time as possible. So my friend remained the only "Fun Flyer" in Cremona.

One day though, reading through the pages of Model Airplane News, I saw Santich's "Fun Hots" It was not exactly a "Fun-Fly" thoroughbred as it resembled a control line profile stunt model. I thought that a model like that would have different and fancier flying characteristics than its lighter cousins, so I designed and built my first "Quock".

By the way, this name does not mean anything in Italian. I had previously designed a model named Quick, so Quock seemed like a good choice. I accepted some weight penalties in order to have a sturdier airframe, which would be less prone to flutter. So I parted from 1/4" thick ailerons and chose shaped ones. They are a little heavier and take longer to build, but built this way they are sturdy enough. Being a mechanical engineer my job is to design industrial metal structures, such as oil refinery tanks,

pressure vessels, cereal stores, hangars and so on, so I chose a scientific approach to the project.

Wingspan was set to one metre as this is the length of balsa sheets usually found in modelling stores here on the continent. Later, having found 105 centimetre long sheets, the wingspan was increased to this length *(builders in the UK may have to splice two sheet together to achieve the required length–K.C.)* These sheets are 10 cms wide (4"), so the wing chord was chosen and the longeron positions set to allow the leading edge to be sheeted with one single piece without cutting. Trailing edge sheeting width was set at 5 cms (2") so one cut would give both top and bottom pieces. All this helps to reduce building time to a minimum. Believe it or not, having previously prepared the rib cutting template, I built my first wing in just 2.1/2 hours one Saturday afternoon. The only things left to do were to shape the leading edge and install the servo mount. No jig is required, you only need a straight building board and one 1/2" square balsa stick. The only glue used is thin and medium cyano. But more on construction later.

When building a model of this type, it is important to carefully select your balsa wood. A heavy sheet can weigh twice as much as a light one, so use medium to hard 1/4" sticks to build the tailplane, medium to light sheets to build the wing and light balsa for fuselage.

Many Quocks have been built in Italy. From time to time I hear funny things, such as: *"I had to lenghten the nose by two inches to get a correct C.G."*, or, *"Construction seemed weak, so I reinforced this and that. But this model does not really fly the way you promised! It only weights 2 kgs."* (That is almost 50% more than the design weight!) To date I have built three models. The first one, with normal servos and radio gear, weighed 1.5 kg (some 3 lbs.), the next was 1.35 kg, and the last one, with an extended wing, was 1.4 kg and not one needed a fraction of an ounce of lead. So watch your feet, gentlemen!

I said that Quock is not as light as a real fun-fly, nonetheless it should be built as light as possible. Where you can easily gain weight is with the radio gear. I use one micro servo for throttle, two high torque minis for rudder and elevator, and two standard servos for ailerons. I also use a mini Rx and a 250 mAh battery. I have flown six 5-6 minutes flights in a session with no problems. With this setup is it possible to spare as much as 150 grams, or a little more than 5 ounces. While not seeming an impressive gain at first glance, you should consider that this is more than 10% of the total model weight and I can assure you that the difference is readily noticeable.

My model is powered by an SC32 engine,with muffler. This is a powerful, affordable and reliable engine, and it is very light. I use an 11 x 4" propeller cut down to 10.1/2" and 10% nitro fuel. To get 5-6 minute flights, I have installed a 75 cubic centimetre tank (2.1/2 fl. ozs.)

What can you get from a model like this?

Take off straight from your hand is a common and simple task. The roll rate is as fast as a real Fun-Fly model, and loops are as tight as anyone can wish.

You can also do upright or inverted flat spins. Quock keeps flying through the spin, and when you release the sticks it instantly resumes straight flight. Spin descent is so slow that you can get bored before the model reaches a low altitude, so do not enter too high. To enter the spin apply full throttle, full elevator and full left rudder and aileron. Gradually reverse the aileron until halfway in opposite direction (this depends on control surface throw). To get out simply neutralise the rudder and aileron and hold in some elevator.

You can also fly knife edge at half throttle at a speed so slow that you can really master this manoeuvre with ease. Entering knife edge at full throttle and holding top rudder is the way to start a knife-edge loop.

A "crowd pleasing" manoeuvre is the "Trapano". This is Italian for drilling machine. You go high, then from straight and level pitch down to vertical and feed-in full aileron. The model comes down with a speed corresponding to your throttle setting, the more the better for the crowd, spinning like a boring tool. To stop, simply release ailerons and give some up elevator.

This model can hover like a helicopter. With a little wind you can hover on a fixed point and if the wind is stronger you can go backwards by juggling the elevator to control speed and throttle to control height. With no wind at all you can hover with the fuselage perpendicular to the ground (prop hang) and, if you are good enough, it is even possible to go up and down in the hovering mode.

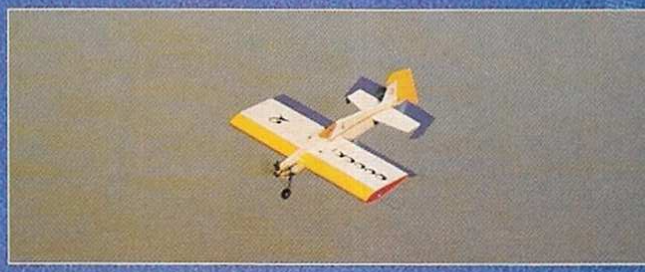
Just in case you wish to fly the Quock like a "normal" model, it does this as well, being fast and really stable. You only need to reduce the control surface throws.

Construction

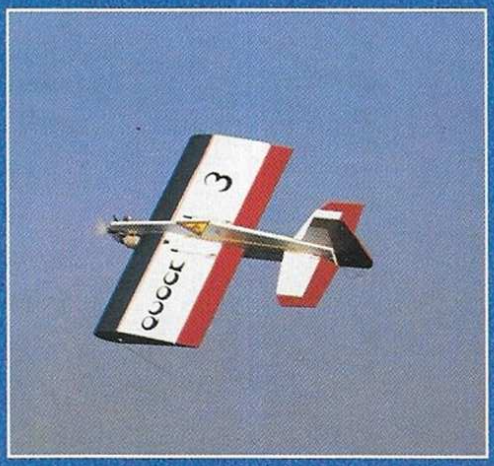
Start construction by preparing a template for cutting the ribs. Reinforce four ribs with ply, these will become the centre ribs. Fix the plan onto the building board and pin the lower spar in position. Mount the ribs, making sure that they are square to the spar. Pin the 1/2" square balsa stick to the plan to support the ribs. The ribs should be exactly aligned at the trailing edge. Insert the upper spar and glue the ribs using thin cyano. Cut the trailing edge sheeting, hold in position on the top of each rib with two pins and tack glue with thin cyano. Remove assembly from the building board and turn upside down.

To hold it straight, weigh down with a long lightweight bar (long steel ruler or similar). Permanently glue on the rear sheeting, previously only tacked in place, then install the remaining T.E. sheet in the same way. With a long sanding bar, very carefully sand both rear sheets to get a straight surface to which to glue the 1/4" balsa trailing edge using thin cyano.

Check that the leading edge sheeting is positioned with its rear edge on the middle of the spar, align it at both ends and glue with cyano along all of its length. Reverse the assembly so as



Quock has a chunky wing in true fun-fly style, but its profile fuselage aids orientation and aids knife edge flight.



Bright colours are best for keeping track of Quock as it gyrates around the sky.

to have the sheeting face down on the building board. Weigh down as before and add some more if needed.

Curve the sheeting over the centre rib and tack glue with cyano. Repeat with the nearest rib to the left, and then to the right, working towards the wing tips. When all of the ribs are tack glued use more cyano to get a permanent bond. Repeat the same procedure for the second row of sheeting.

Glue the centre section bottom sheet in position. Now very carefully sand the leading edge. Using thick cyano, glue the 3/8" balsa leading edge against the rib and sheeting.

Until this moment the wing has very little torsional rigidity. This is achieved only with the gluing in of the vertical spar webs, so it is very important to verify wing alignment before this step. Hold the wing on the building board with weights as previously described. Eyeball the trailing edge for straightness, remembering to use the 1/2" square balsa stick. When satisfied, glue one web at a time in position using thick cyano.

To complete the wing, plank the top centre section, then shape the leading and trailing edges, and install the tip ribs, wing skid retainers and capstrips. Complete the servo compartment by installing the servo tray and add ply gussets for the hatch fixing screws.

Ailerons

Glue together two 3/8"balsa triangular sticks. Use slow setting cyano and do not glue the entire length. This assembly will become a straight, preshaped aileron leading edge. Glue it to the 1/4" false aileron leading edge, keeping the assembly straight. Pin onto the building board. Pin down some 1/4" scrap balsa pieces to hold the 1/4" square balsa trailing edge at the right height on the building board. Cut 1/4" balsa sheet to the desired length and glue between the leading and trailing edges. Repeat this step using 1/8" balsa sheet to form diagonal ribs. Insert the balsa block to reinforce the inner section. Fix a sheet of rough sandpaper to the building board with double sided adhesive. It should be at least 50% more than the length of the aileron. Sand the aileron to shape with the help of this straight sanding bar. Of course, you have to move the aileron, not the building board!

The tailplanes are built directly on the building board. Leading edges for both are built as previously explained, but use 1/8" triangular balsa strip. Glue 1/32" ply roundels where the control horns will be inserted. I use 3 mm diameter bolts as horns.

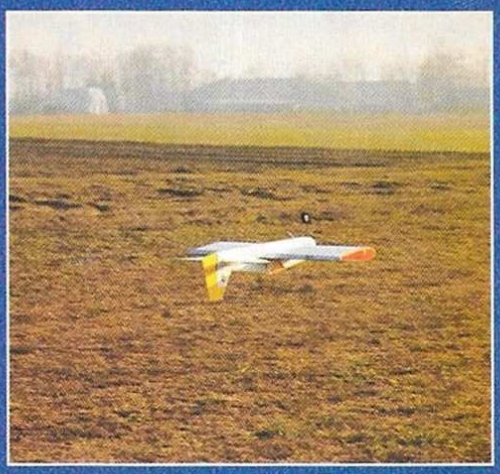
DATAFILE

Plan Specifications

Name	Quock 3
Designed By	Giuseppe Ghisleri
Aircraft Type	Profile Fun-Fly
Wingspan	41.1/2"
Wing Chord	16.1/2"
Wing Area	685 sq.ins.
Aerofoil	Symmetrical
Dihedral At Each Tip	None
Fuselage Length	40.1/2"
Tailplane Span	22"
Tailplane Area	176 sq.ins.
Tailplane Section	Flat plate
Fin Height	8.3/4"
Engine Range	28 -.35 cu.ins.
Fuel Tank	2.1/2 oz.
Rec. Number of Channels	Four
Control Functions	Aileron, elevator, rudder, throttle
C.G. (from L.E.)	4.1/2"
Elevator Throws	Max. possible
Aileron Throws	Max. possible
Rudder Throws	Max. possible
Sidethrust	None
Downthrust	None

Materials Used in Construction

Fuselage	Balsa, ply, spruce
Wing	Balsa. ply, spruce
Tail Surfaces	Strip balsa, spruce
Weight, Ready to Fly	1.4 - 1.5 kg



How low can you go?

Fast fuselage

Building the fuselage is very simple. Note that the tail end is left open to allow the elevator to be fitted. Cyano the fin in position, insert the wing into its slot and glue to fuz with white or aliphatic glue. Drill a hole for the landing gear rod. The rod should be filed to give a better grip when it's glued in position.

To keep weight down it would be desirable to cover the model Fibafilm, but I had some problem finding Balsaloc, so I covered my model with Solarfilm.

Flying

The tank is fixed with rubber bands, and the Rx and battery are installed between the leading edge sheeting, held in position with some foam. Mount the switch on the removable hatch, together with the connector for battery charging.

Surface movement should be set to the maximum possible without stalling the servos. If using a programmable radio, set it up so that with two servos driving the ailerons, they can be coupled to the elevator to move as flaps. A 1:2 ratio is advisable, so that the flaps rotate half as much as the elevator, but in the opposite direction. It is advisable to use exponential on all moving surfaces. I have set my radio to 30%, but this still requires some attention around neutral. For your first flights it can be helpful to use the rate switch. I also have a three position flap switch, giving neutral, up and down.

On Quock 2, I experienced some slow flutter on rudder whilst diving at full throttle. This was caused from a flexing nyrod. On Quock 3, I have replaced the plastic snakes with 1/32"dia. wire running inside a plastic sleeve. This solution is no heavier, but is much more rigid. As an added bonus the trim does not change with different temperatures.

All in all this is a model that requires little time to build and that flies both like a "Fun-Fly" and a conventional model. With reduced surface movements it is stable and forgiving, and flies like an advanced trainer. Who could ask for anything more?

Have FUN with the Quock!●