

YAK 54

Frank Skilbeck tests this 1500 mm span sporty electric scale aerobat from Max-Thrust

While we are all familiar with the progress made in the electronics side of the hobby we don't often think of the development and progress that is going on in the airframe side as well. Foam models are a classic example; a few years back they were a small oddity restricted to small and niche models, but as manufacturing techniques are improving the models are getting better, larger and more diverse all the time and the Max-Thrust Yak 54 we are reviewing here is a prime example, a scale representation of a Yak 54 with a wingspan of some 59" (1500 mm) using a 4S LiPo power driving a 15" x 8" propeller, pretty much a .60-size model.

BOXES WITHIN A BOX

Opening the box doesn't immediately reveal the parts, but a second series of boxes that all fit perfectly inside the main box (like a child's puzzle). Inside each of these separate boxes are the components, further protected in bubble wrap, a very neat and secure way of protecting the model during transit.

Once unwrapped, I was pleasantly surprised at the quality of the mouldings. Century UK advise that it is moulded from Epoflexy, which seems very similar to other high-end foams around, with a very smooth surface, and very white! A reasonable amount of detail has been included, extending to louvres on the cowl and 'ribs' on the control surfaces, which were hinged using proper hinges. Servos, motor and ESC were all pre-fitted, but slightly unusual is the tail section of the fuselage has to be glued on and the model is supplied with two tubes of glue for this that resemble UHU-Por, often used on EPP models. Other parts

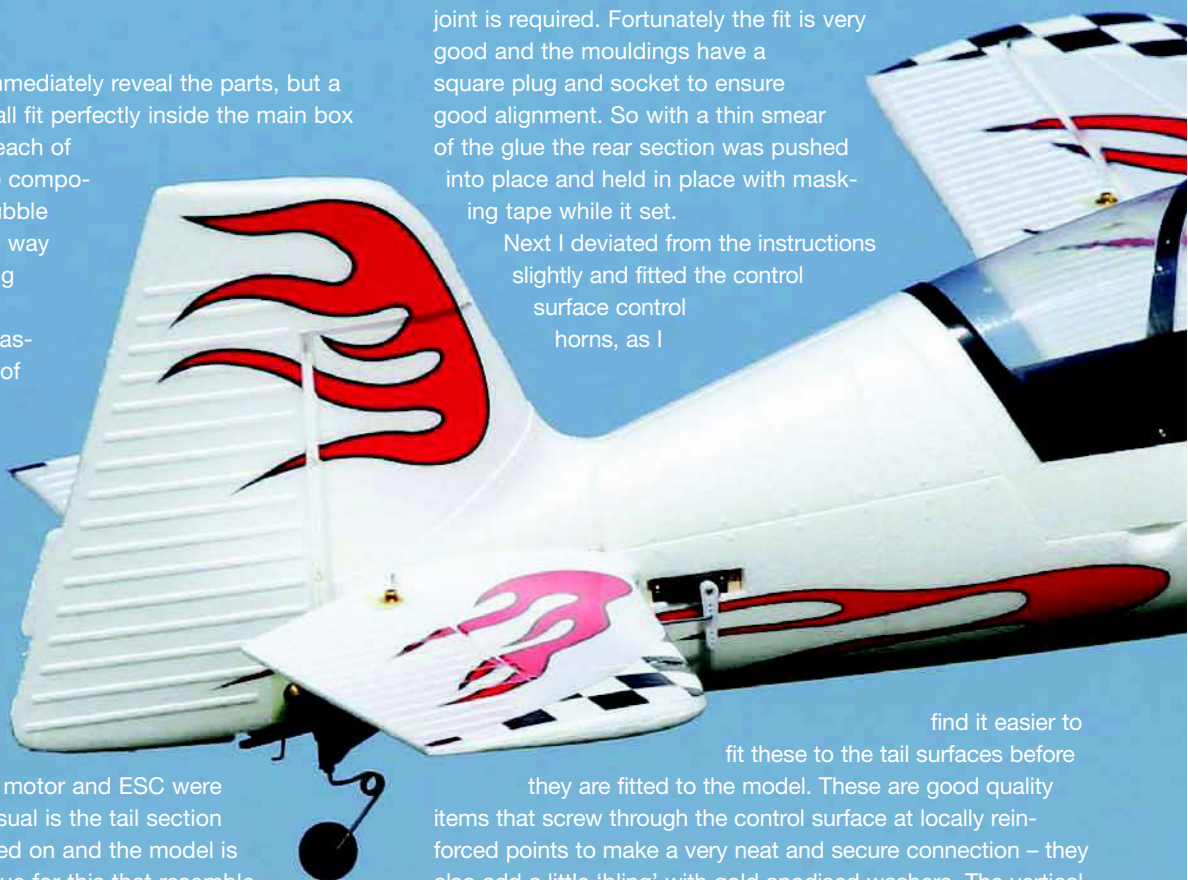
“Servos, motor and ESC were all pre-fitted”

required to finish the model, including the decals, were all supplied in various plastic bags together with colour photocopy instructions.

GETTING BUSY WITH THE STICKY

First job is to glue the rear section of the fuselage into place; this supports the tailplane and tail wheel so a good joint is required. Fortunately the fit is very good and the mouldings have a square plug and socket to ensure good alignment. So with a thin smear of the glue the rear section was pushed into place and held in place with masking tape while it set.

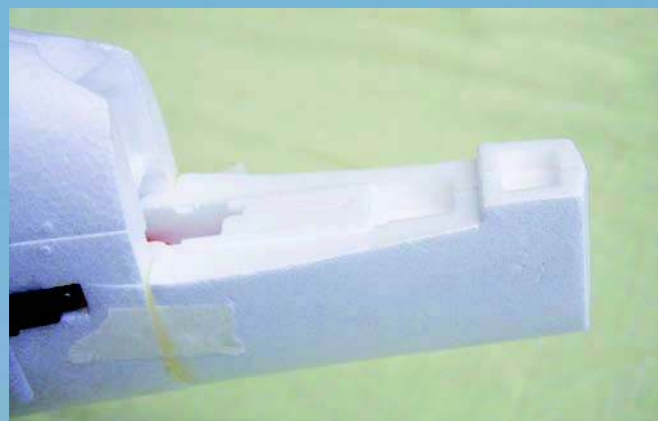
Next I deviated from the instructions slightly and fitted the control surface control horns, as I



find it easier to fit these to the tail surfaces before they are fitted to the model. These are good quality items that screw through the control surface at locally reinforced points to make a very neat and secure connection – they also add a little 'bling' with gold anodised washers. The vertical and horizontal stabilisers are then attached to the rear of the



All main parts were further protected with bubble wrap

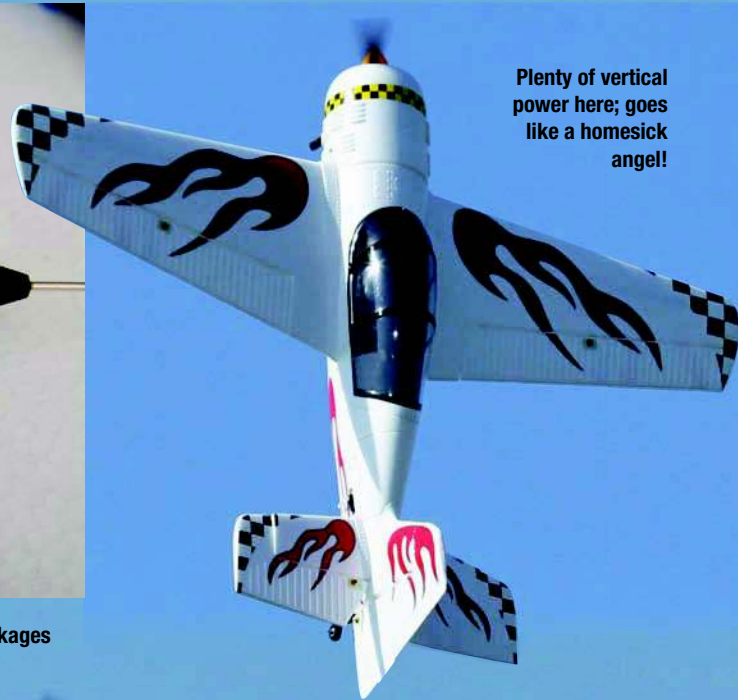


The unusual support for tailplane, and tail wheel is glued to rear of the fuselage

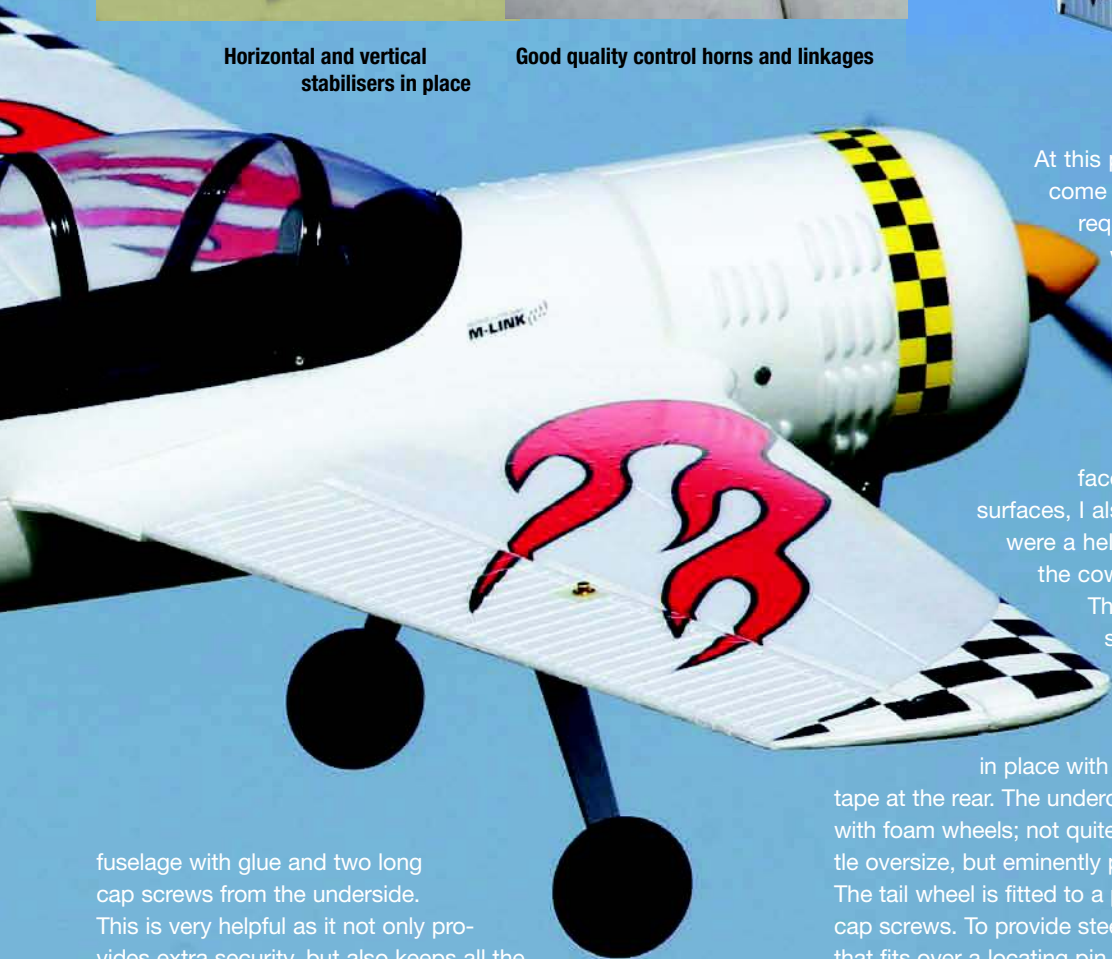


Horizontal and vertical stabilisers in place

Good quality control horns and linkages



Plenty of vertical power here; goes like a homesick angel!



fuselage with glue and two long cap screws from the underside. This is very helpful as it not only provides extra security, but also keeps all the parts aligned while the glue sets. The control rods for the tail surfaces were all fitted next and these are pre-bent to the correct length, were a snug fit in the servo control arm, and used a screw to fit onto the control surface horn; not only very easy to fit but providing negligible slop and a very secure connection.

The Yak uses separate servos for each elevator half and one of these comes ready reversed so they can be connected to a single elevator output on the receiver using the supplied 'Y' lead.

I moved onto the main wings next. Control horns fitted first and then the control rods, using a servo tester to centre the servo and hold it in position while the control rod length is adjusted.

At this point I applied all decals. These come pre-cut and are self-adhesive only requiring the backing to be removed while positioning them and smoothing them down. I must admit that I am not too brilliant when it comes to applying decals, but these went on fairly easily just needing a little patience on the control surfaces where they go over the ribbed surfaces, I also found that a spare set of hands were a help when applying the decal around the cowl.

The main undercarriage attaches to a substantial ply plate with four cap-headed bolts into pre-installed captive nuts, tidied up by a small fairing on the fuselage that is held in place with a tab at the front and double-sided tape at the rear. The undercarriage itself is a typical Dural type with foam wheels; not quite scale and the wheels seemed a little oversize, but eminently practical for a typical UK flying site. The tail wheel is fitted to a ply plate with a further two 3 mm cap screws. To provide steering the tail wheel has a slotted arm that fits over a locating pin on the rudder.



Tail wheel is bolted to fuselage and steering provided by pin on rudder

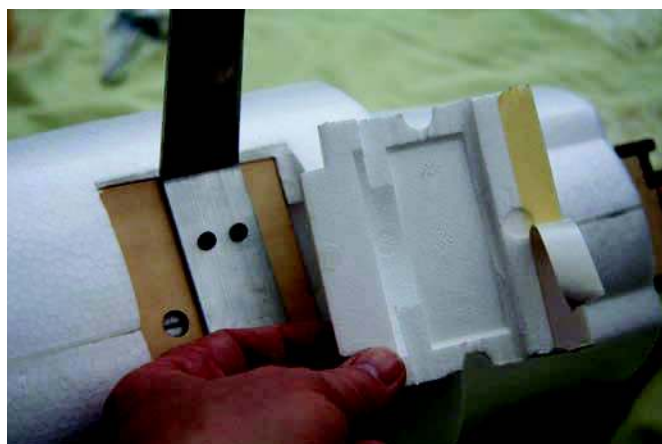
Nice axial rolls; note contrasting colour scheme on underside



“The propeller and spinner wouldn’t be out of place on an I/C model”

Next up was to refit the cowl (I’d removed it to apply the decal to it) and fit the propeller and spinner. The prop driver is fitted to the motor with four bolts, the spinner back plate and propeller fitted, and finally the front of the spinner held on by two self-tapping screws. The propeller and spinner wouldn’t be out of place on an I/C model.

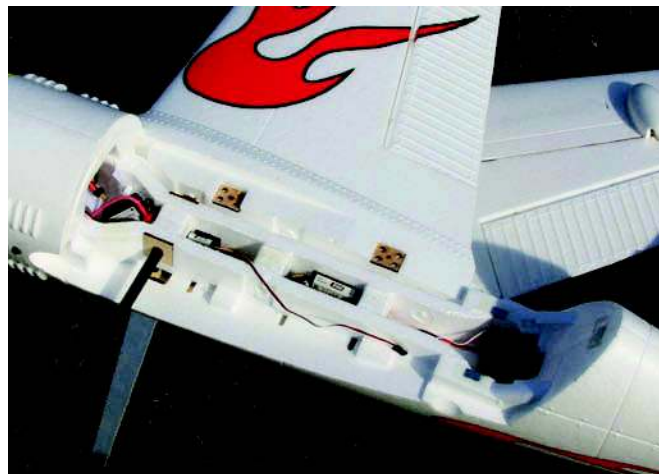
The clear canopy was fitted to the foam canopy frame using the supplied small self-tapping screws. Ply mounting blocks are provided in the foam, and to get a good fit I put some masking tape over these and drilled a small pilot hole into the mounting block. The masking tape was then partially pulled back, the canopy positioned and held down with the masking tape, which now marked exactly where the holes were



Dural undercarriage is fixed to substantial ply mounting plate with cap head screws and captive bolts. Undercarriage fairing held in place by forward tab and double-sided tape

required in the canopy. These were drilled, masking tape then removed and canopy screwed into position. Quite a secure fitting and useful as I didn’t have a pilot for the maiden flights, but this allows me to easily install one at a later date. The completed canopy slots onto the main fuselage and is retained by some strong magnets and an internal rubber band for additional security in those high ‘G’ manoeuvres, while being easily removable to get at the battery and radio components.

All that was left for now was to fit the wings and install the receiver. The wings are joined to the fuselage by a carbon tube, which is threaded through some plywood mountings in the fuselage and then into the carbon tubes that run the full



Wings slide onto carbon joiner tube; plenty of room for receiver and telemetry sensors



Inverted flight only needs a dab of down elevator

length of the wing. Note there are no stops in the wings for the joiner tube so you need to make sure that you keep it central while installing the separate wing halves. The wings are held secure by two cap-head bolts on each side, which go into captive nuts in the fuselage and not only retain the wing but also provide the alignment.

RADIO INSTALLATION

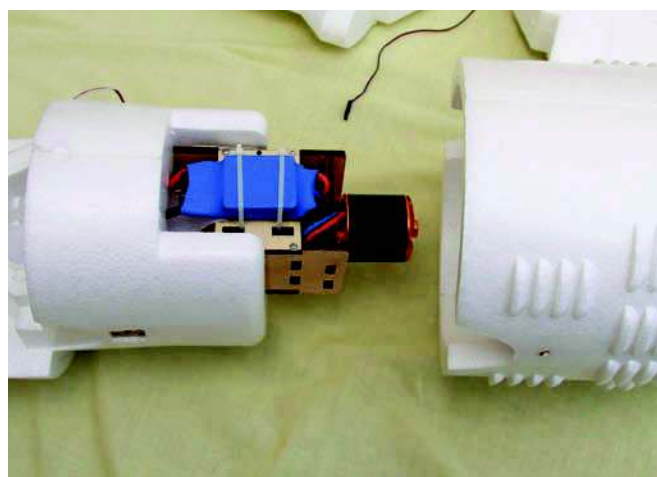
The Yak as supplied comes with 'Y' leads for the aileron and elevator servos, so it could quite easily be flown with a 4-channel receiver. I opted to use a receiver with more channels and dispense with the 'Y' leads and use the inbuilt mixing capabilities of my transmitter, allowing me to fine-tune the

individual control surface movements electronically; not strictly necessary but if you have the capability you might as well use it. Due to the design of the fuselage the space for the receiver is quite narrow but I had no problems fitting a Multiplex RX-9-DR 9-channel 2.4 GHz receiver and positioning the two aerials, with space to fit telemetry sensors to measure amps, volts and temperature via M-LINK.

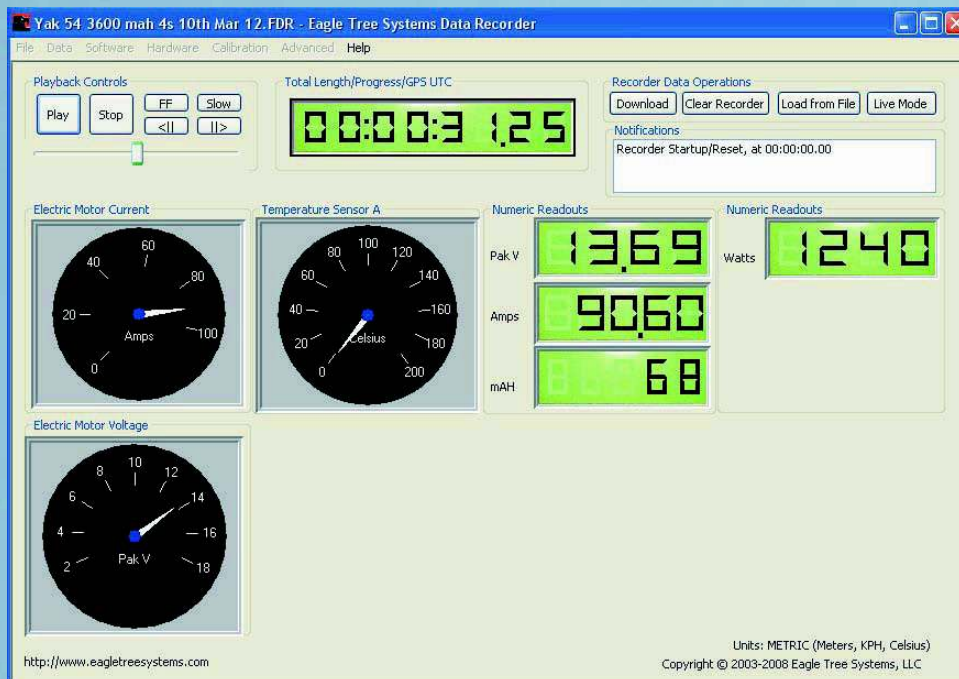
The instructions recommend that all control surfaces are set for 10 mm deflection each way for initial testing. This didn't seem very much so these were dialled in for the low rate setting and increased to 20 mm each way for the elevator and ailerons and 25 mm for the rudder on high rate, with 30% exponential for good measure.



Wings aligned and held in place by four cap-head screws



Access to motor and ESC



Telemetry readout shows no shortage of power here!

Once happy with the radio installation I added the covers over the aileron servos, as these are glued on I just tacked them into place in case they ever need to come off again.

NO SHORTAGE OF POWER

Max-Thrust recommends a 3350 mAh 4S LiPo battery for the plane. I didn't have this size so I used a 3600 mAh 4S instead. This fit neatly into the battery bay and the Yak balanced right in the middle of the recommended range.

Next up was to do a power run on the ground, so I hooked up my Eagle Tree Logger, secured the plane and gingerly opened the throttle. Wow, it span up smoothly and was initially pulling just over 90 amps (1250 watts) dropping off to 80 A (1100 watts) after 15 seconds or so, spinning the 15" x 8" prop at just over 8,000 rpm. As the plane weighs 2.25 kg (or just under 5 lb in old money) this is over 200 watts per lb, should be adequate then.

For flight, rather than set a timer I programmed the telemetry to alarm when the battery level got to 15% (540 mAh) left or flight pack voltage dropped below 12.6 V.

BLUE SKIES BECKON

The day after finishing the model the weather conditions were perfect for the maiden; just a light breeze and clear blue skies, so after a power on range check and the obligatory ground photos, the plane and photographer were in position and it was time to go.

The Yak took to the sky in a few yards on less than half throttle and immediately it was apparent that this is one smooth model. A couple of clicks of aileron and elevator trim had it flying around very smoothly on the low rates, and at this setting it is easy to do very smooth aerobatics, the full BMFA 'B' schedule is, as you'd expect, no problem, and it will knife-edge the length of our field.

The rest of the first flight was spent doing low passes for the flight photos and after 7 minutes, the telemetry battery mAh alarm went off and it was time to bring it in.

The Yak was very steady on the approach and I opted to bring it in on the mains. After a short roll out I ran out of elevator authority and it gently nosed over, so a mental note was made to leave a bit of power on next time until the tail is on the ground.

After a coffee, we fitted the second battery and the 'Snapper' said it would make a good shot if I could climb vertically straight from take-off, so this time I gave it a few more beans, lifted off in a few feet and was climbing vertically in no time. I then tried the high rates and as expected the Yak becomes much more responsive, but with exponential I'd dialed in it was not at all

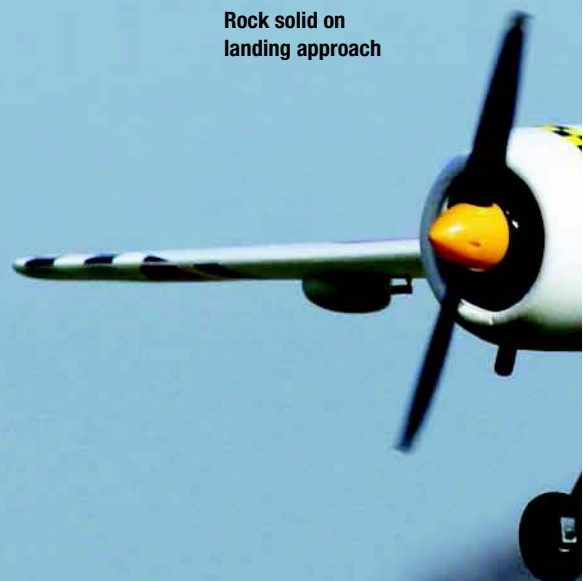
twitchy. Rolls were now much faster but still axial and there was a slight tendency to screw out on tight loops. Although no expert, I found I could get the Yak to prop hang and it was quite controllable in high-alpha manoeuvres.

PROPELLERS

In view of the high amps being pulled with the 15" x 8" propeller and the excess of power I thought the Yak would fly fine on a smaller propeller so a 14" x 6" APC I/C and 14" x 7" APC-E propeller were tried and the results are below:

PROPELLER	RPM	AMPS
15" X 8"	8,100	90
14" X 7"	8,350	74
14" X 6"	9,100	62

Rock solid on landing approach





Author shows off the hi-vis' scheme

Based on the results the plane was flown with the 14" x 6" and this proved to have ample power, just needing a higher throttle setting for vertical climb outs (on the 15" x 8" it will go vertical on under 60% throttle), so if you are a throttle happy pilot and concerned about pulling too many amps then I can confirm that the Yak is perfectly happy on a smaller prop.

SUMMARY

On a subsequent flight I handed the sticks over to a fellow pilot (thanks Gary) who predominantly flies aerobatic models, but not of the foam variety. After a few seconds to familiarise himself with the Yak and my transmitter he put it through its paces. He noted it flew well but needed a slight amount of rudder elevator mix in the knife-edge, and on high rates the elevator was maybe a little too sensitive. (Tx adjustments will soon sort this; Ed.)



SPECIFICATION

INFORMATION

NAME:	Yak 54
MANUFACTURER:	Max-Thrust
DISTRIBUTOR:	Century UK
PRICE UK:	£199.99
OPTIONAL PILOT:	£4.99
MODEL TYPE:	Aerobatic Electric Stand-off Scale
MOTOR:	Brushless Outrunner
ESC:	80 Amp pre-fitted
BATTERY:	4S 3600 mAh LiPo
PROP:	15" x 8" prop
CONSTRUCTION:	Epoflexy Foam

R/C FUNCTIONS

Rx used: MPX RX-9-DR M-LINK	
Five 17 g metal-gearred servos pre-fitted	
1 Aileron (2 servos)	3 Throttle
2 Elevator (2 servos)	4 Rudder (1 servo)

SPEC

WINGSPAN:	1500 mm (59")
WING CHORD:	370 mm root, 200 mm tip (14.6"/7.9")
WING AREA:	0.36 m ² (3.94 sq ft)
LENGTH:	1210 mm (47½")
TARGET WEIGHT:	2250 g (5 lb)

DISLIKES

Decals a little tricky to apply neatly

LIKES

- Well packaged
- Fit and finish
- Good quality hardware
- Flying performance

CONTACTS

CENTURY UK
WWW.CENTURYUK.COM
 01795 437056

So apart from the initial motor woes, I am really pleased with this model. It goes together well, looks the part and flies even better. The fit and finish of all the parts is very good and the supplied hardware well up to the mark. At just under £200, while it may seem expensive for a foamy, it is incredible value for a 60-sized aerobat, which comes with everything bar the flight battery and receiver. **RCMW**