SPITTY CLUB COMBAT

Michael Oates reports on the Basingstoke MAC's model of choice for their 2023 club challenge

Words & Photos: **Michael Oates**

In looking for a new challenge for Basingstoke Model Aero Club I came across streamer combat where pilots try to cut an opponent's trailing 30-foot crepe streamer with their propeller. The concept developed into a team challenge with points and prizes awarded and the top team crowned. Each participant would have a similar spec plane: size, weight, motor and propeller. However, when searching for suitable kits a lack of stock prevented the purchase of the number of models required. So, we would need to build our own and in searching for plans I came across the Spitty. It would fit the bill, being a small, light foam model that was easy and cheap to build and repair. The plan was free, in German, and the plane could be built for around £30.

The key material was Depron, which was difficult to source as the white Depron was no longer manufactured and the grey version was found not to be suitable. However, we sourced a supply at a reasonable price from Germany. A prototype was built and flown, trailing its streamer, and was found to be an excellent flyer. The combat event was presented at one of our club nights and sixteen members signed up.

Deluxe Materials kindly offered a prize for the best model and sponsored a build that would be raffled.

PERSONAL CHOICE

One great thing about this model is that it can be customised. Most models have been built as Spitfires, but some have had their outline changed to resemble a P-40 Warhawk, Bf109, P-51 Mustang and a P-47 Thunderbolt. We have even had a twin-boom EDF version representing a Vampire. We have also seen models 'improved' by lowering the wing, changing the fin outline and adding dihedral!

Some variations in construction method and detailed design have been tried. Of these we have found that models really need the CG at least 1 cm further forward than stated, at least for the first flight. This is easier to achieve if you and extend the nose and move the motor forward 15 mm. You can download the Spitty plan from here: https://www.flugmodell-magazin.de/?s=spitty

Spitty is a small, light, foam model that is easy and cheap to build and repair.

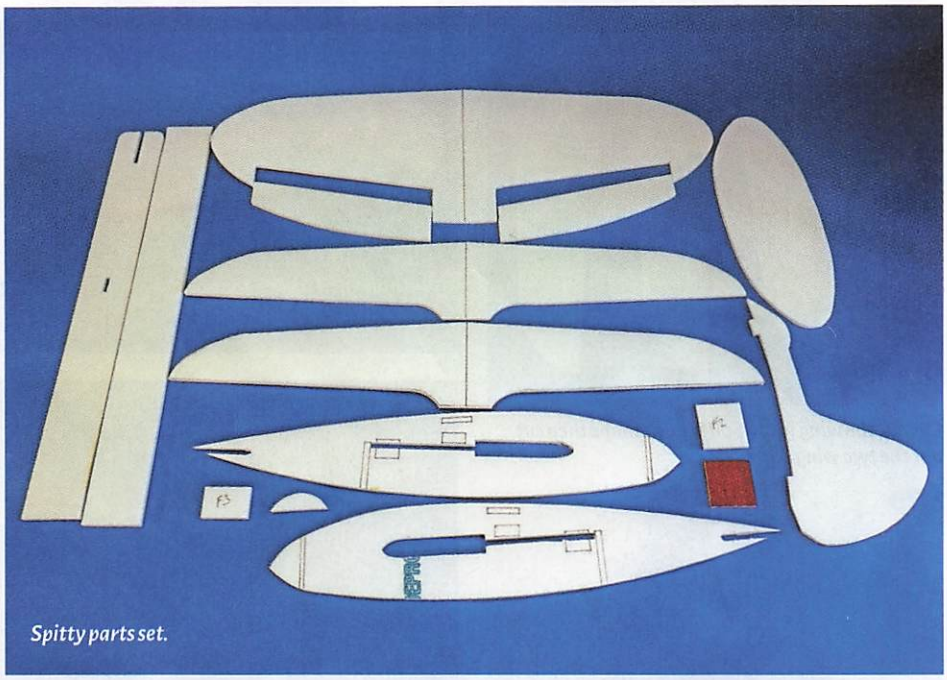
PLAN & CUTTING OUT PIECES

There are two options for the plan: print out A4 sheets and stick them together or print out at A3 for a complete plan (around £3.00 from a local printer). Some parts are only printed once, e.g. the fuselage side, so either use the cut piece as a template or use two plans. Our Depron came in a 620 x 800 x 6 mm size so one and a half sheets were required per plane.

Cut out the shapes from the plan and place on the Depron sheet to ensure they all fit. Stick down the shapes using low tack tape. Allow room for two sides of the fuselage as only one is shown on the plan. You don't need the fin and cockpit as they are covered by a separate piece. The wing has a central piece but also requires two stiffeners, one above and one below.

Cut out the parts. Use new scalpel blades and change them after several long cuts. Blunt blades will tear the Depron.

When cutting the glued parts ensure you make a right-angle cut. These parts will be glued to a flat surface so a right-angle cut will achieve the best adhesive surface.



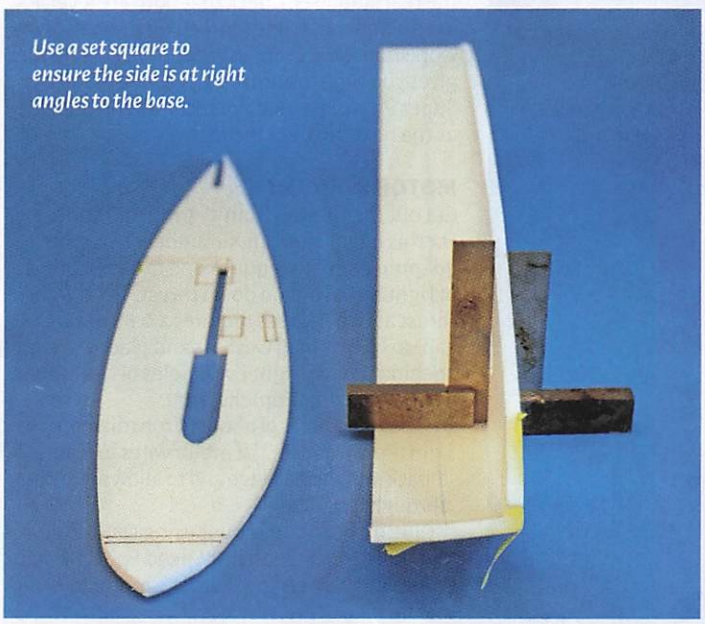
Spitty parts set.

FUSELAGE

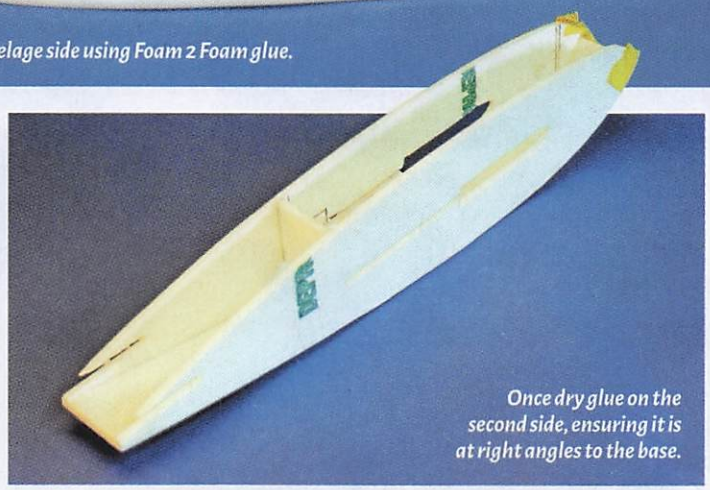
Use the pin method to mark where the formers will go. When cutting out the sides I cut the inner shapes out first before cutting around the outer edge. This keeps the plan in place on the Depron. Use the first side to act as a template for the second side. The key is to ensure that the hole for the wing is identical and level in both fuselage sides and also the slot for the rear stabiliser is level. I put the two sides together and pushed the wing through its hole. I also put a piece of Depron in the stabiliser slot. This enabled me to check they were level and a snug fit.

As the fuselage sides have a curved shape it helps if the top and bottom pieces are rolled to create a slight curve, particularly at the nose. Stick the base of the fuselage to the bottom of one fuselage side using Deluxe Materials Foam 2 Foam glue. You may need to tape the base to the side at the nose to keep them together due to the curved shape. Once dry glue on the second fuselage side. Glue in the Depron formers F2 and F3.

Stick the base to one fuselage side using Foam 2 Foam glue.

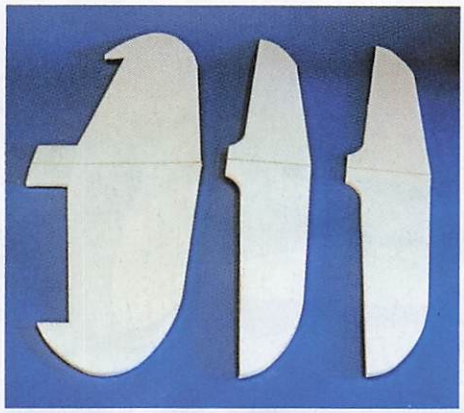


Use a set square to ensure the side is at right angles to the base.

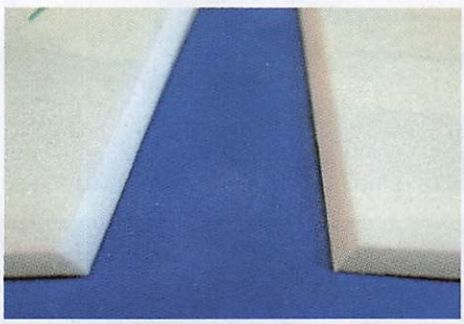


Once dry glue on the second side, ensuring it is at right angles to the base.

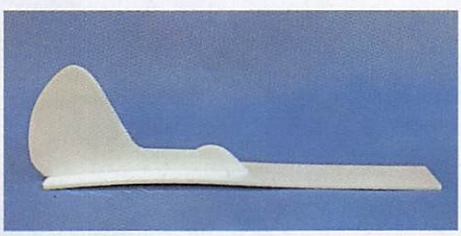
Glue in the Depron formers F2 and F3.



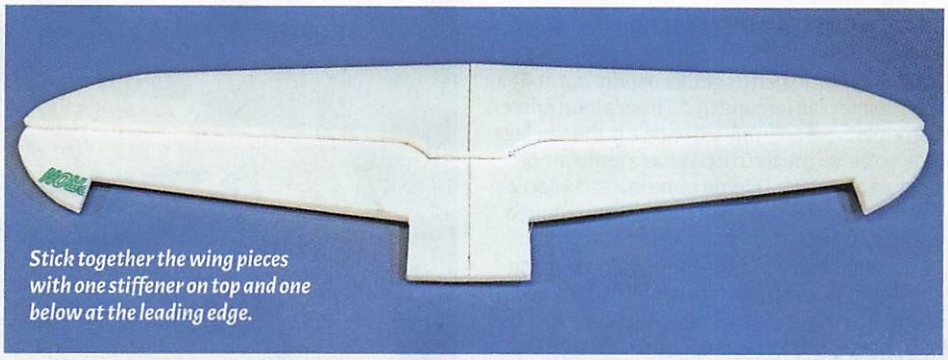
Cut out the wing into a Spitfire-ish shape then cut out the two wing stiffeners.



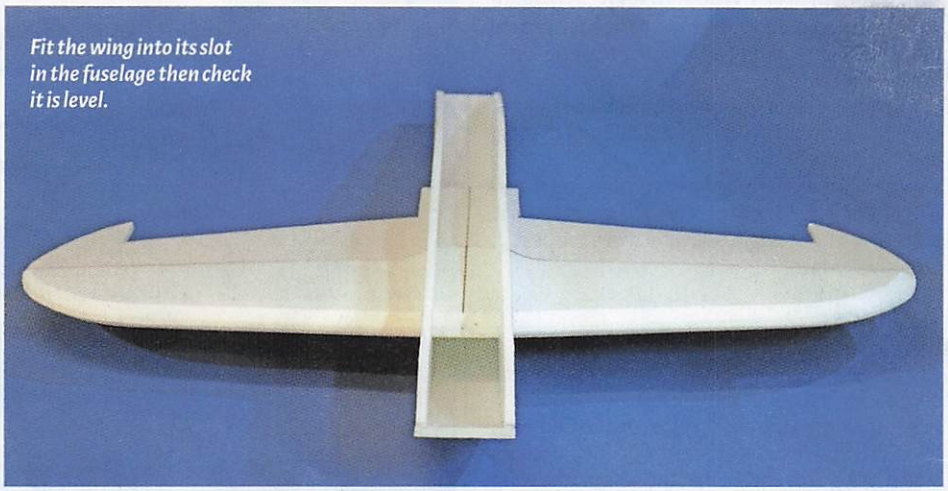
Ailerons will need a bevelled leading edge to allow for downward movement.



Glue on the fin/canopy using a set square to ensure it is at right angles to the fuselage top.



Stick together the wing pieces with one stiffener on top and one below at the leading edge.



Fit the wing into its slot in the fuselage then check it is level.

WING

Cut the wing into a Spitfire-ish shape then cut out the two wing stiffeners. Cut one, then use that as a template for the other. Cut out the ailerons from the main wing. These will need a bevelled edge where they join to the wing to allow for downward movement. Stick it all together using Deluxe Materials Foam-2-Foam glue with one stiffener on top and one below.

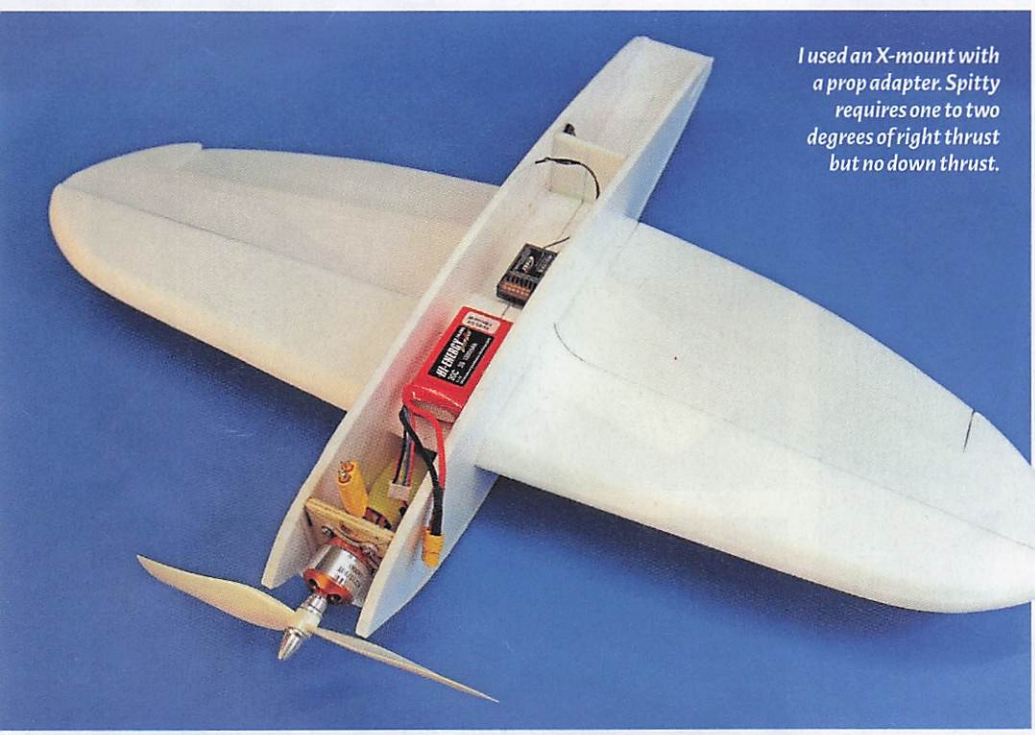
The ailerons need to be trimmed to create a small gap at the ends so they can move freely. Secure in place using Blenderm tape. The gap at the bevelled edge is on the bottom. Horns will need to be attached to the ailerons.

WING, TAIL & CANOPY

Cut out the slots in the top of the fuselage and glue on the fin/canopy.

Cut the elevator off the rear stabiliser part and cut a bevelled edge to its leading edge. Attach to the rear stabiliser using Blenderm tape with the bevelled gap on the bottom.

Fit the wing into its slot in the fuselage, and the rear stabiliser. Check that both are level. I used a horizontal line marked on the wall of my workshop. Glue them using epoxy or a glue that gives you time to adjust e.g., Deluxe Materials Super'Phatic! I would not recommend hot glue as the heat can dent the foam.



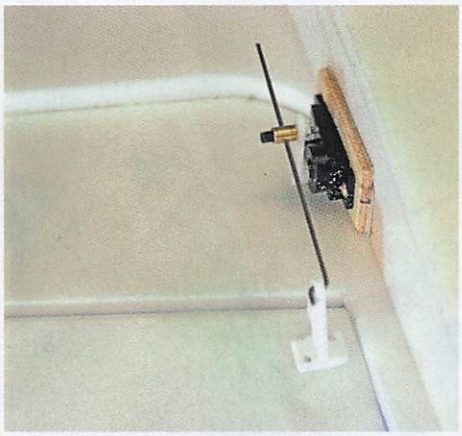
I used an X-mount with a prop adapter. Spitty requires one to two degrees of right thrust but no down thrust.

MOTOR & MOUNT

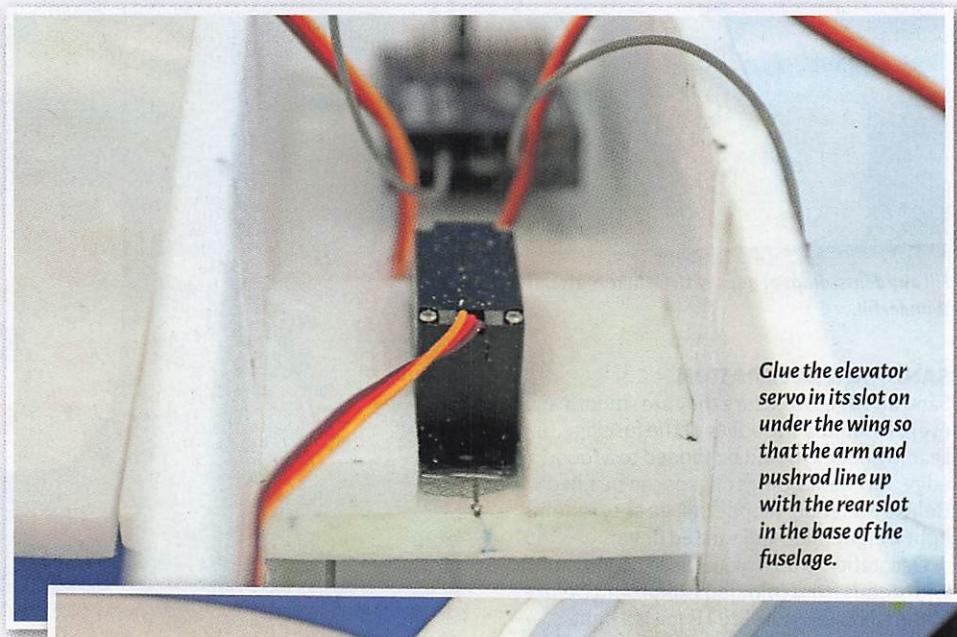
Cut out the firewall from 4 - 5 mm plywood. For this build I used an X-mount with a prop adapter. The plan requires one to two degrees of right thrust but no down thrust. To set right thrust at two degrees requires a 0.88 mm gap, so I used small washers and placed them behind the two right hand holes of the mount when looking from the front.

I drilled holes of about 10 mm diameter in the firewall for the motor wires to feed back into the fuselage and to allow air to pass through for cooling.

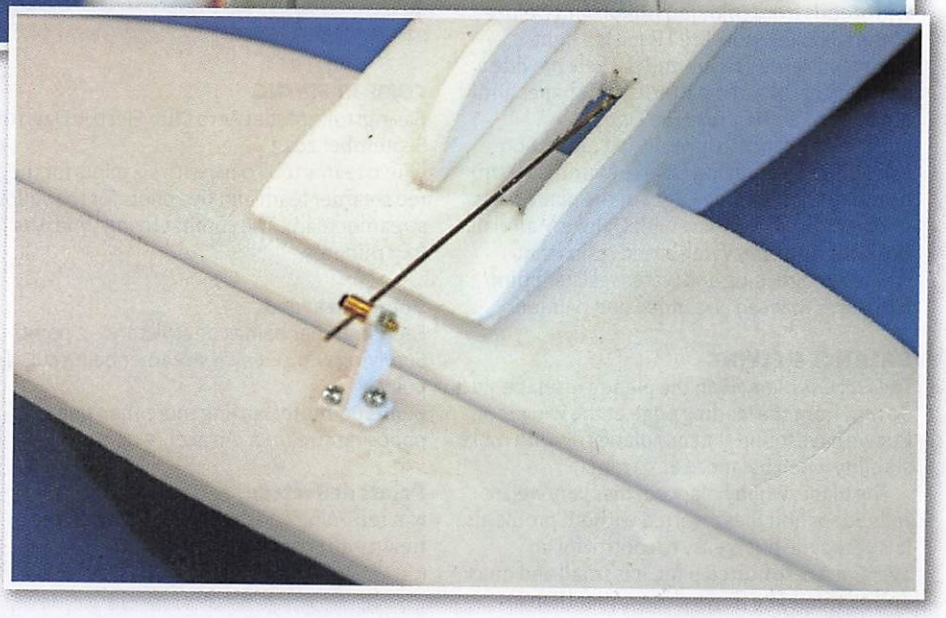
Glue in the motor mount using Deluxe Materials Super 'Phatic! or Speed Epoxy. I used bolts with washers to secure the motor to the firewall.



I used a piece of 3 mm ply to screw my aileron servo to. This pushed my servo further out to achieve better alignment with the horn on the aileron.



Glue the elevator servo in its slot on under the wing so that the arm and pushrod line up with the rear slot in the base of the fuselage.



SERVOS

Cut holes in the fuselage side the size of your servos where indicated on the plan. I used a piece of 3 mm ply to screw my aileron servo to and stuck the ply to the outside of the fuselage side. This pushed my servo further out to achieve better alignment with the horn on the aileron. Fix control horns on the ailerons. I used horns which screwed through the Depron to a base plate.

Glue the elevator servo to the underside of the wing so that the servo arm and pushrod line up with the rear slot in the base of the fuselage. Pass the pushrod through the slot and attach to the horn. Fix the horn to the elevator.

ELECTRIC LAYOUT

There are numerous options for where to put the ESC, battery and receiver.

I made a change by having the battery hatch on the top of the fuselage. So, my ESC was as per the plan, behind the firewall on the bottom of the fuselage. My battery position was on the top of the wing near the leading edge and close to the CG. The Rx was behind the battery, on top of the wing under the cockpit.

Connect all the leads, position and secure the receiver aerial(s), test the direction of the propeller and that the ailerons and elevator work correctly.

For the ailerons and elevator throws see the Datafile.

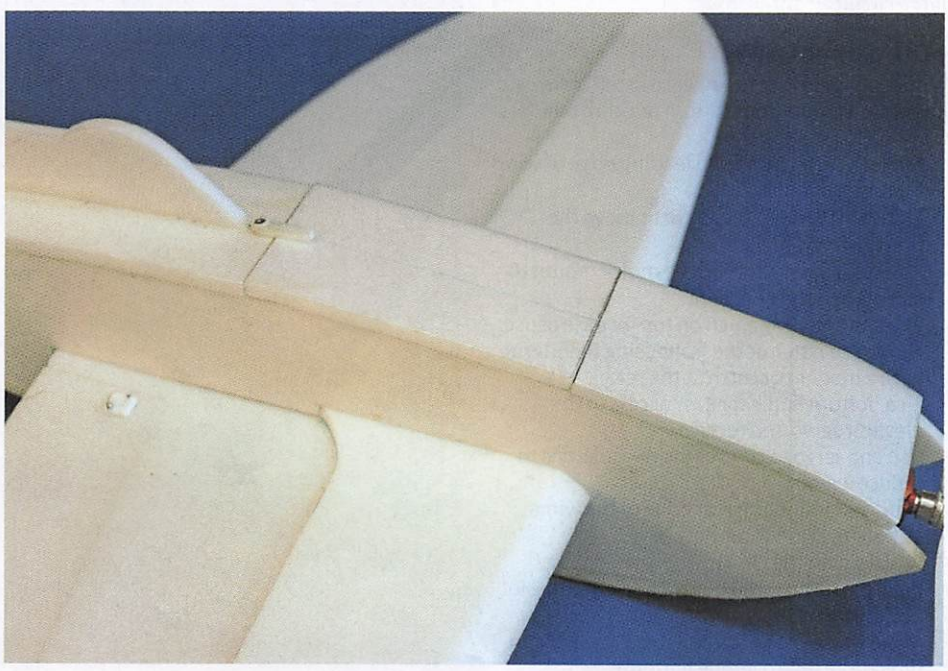
BATTERY HATCH & FUSELAGE TOP

Dry fit the fuselage top and cut at the battery hatch marks. Glue the front piece, place the battery hatch in position and then glue the rear piece ensuring a snug fit.

The battery hatch can be locked in place by gluing a tongue of thin ply underneath the hatch front. The rear can be held with either a catch made from a servo arm/plastic strip or magnets.

STREAMER ATTACHMENT

A Depron tail protector should be glued on as per the plan. The streamer can be attached to this piece. Create a small hole and stick two small washers either side of the hole. This will prevent the string from pulling through the Depron.



Lock the battery hatch in place by gluing a tongue of thin ply to the underneath at the front. Hold the rear with either a catch made from a servo arm or magnets.

Fill any dents, dings or gaps with Deluxe Materials Wonderfill.

For decoration I used acrylic paint, with decals from coloured Fablon and Deluxe Materials Eze Tissue.

SANDING & DECORATION

Sand all edges to ensure they are smooth and even. I rounded the edges of the fuselage. Leading edges should be sanded to a round edge. Any dents, dings or gaps can be filled with Deluxe Materials Wonderfill, an easy sanding light weight filler, and sanded down.

Decoration is up to you. I used acrylic paint, with decals from coloured Fablon and Deluxe Materials Eze Tissue. Eze Tissue is a light weight patterned tissue and packets provide a selection of coloured patterns and shapes and are applied with Deluxe Eze Dope.

The plane can also have added protection from dings by applying Deluxe Materials Foam Armour to the leading edges of the plane parts or cover the whole plane with Deluxe Materials Eze Kote. Both are water-based resins that create a tough, ding and water-resistant film/hard layer that can be sanded and painted.

BALANCE & FLYING

The C of G is marked on the plane's fuselage side, 60 mm from the leading edge at the wing root. But we have found that our planes fly with more stability when balanced at 50 mm.

The plane, when balanced, flies very well. It rolls, loops and flies inverted without problems. It is very agile but is easy to control for an average A certificated pilot. It is small and quick and so should be flown close rather than in large circuits.

PLAN AMENDMENTS

Model builders love to tinker so listed below are suggested amendments from our club builders:

- Move CG to 50 mm from leading edge of wing for better stability.
- Elongate the nose by 1-2 cm to move the firewall forward.
- Add balsa fillets behind the motor mount to strengthen the glue bond.
- Place the battery hatch on top for ease of use.
- Hinge the hatch at the front using Blenderm, with a magnet or catch at the rear.
- Fit a bottom hatch for easy access to the elevator servo and receiver.
- Use one servo to control the two ailerons to reduce weight.
- Sand and round the rear edge of the wing stiffeners to aid to air flow.
- Add a slot in the chin to improve cooling.
- Enlarge the pushrod hole or add an extra slot at the rear to allow air out.
- Make a hole in the former above the wing to provide airflow over the battery.
- Make additional formers to F2 and F3 for strength and stiffness.

COMBAT FLYING

Basingstoke Model Aero Club Electric Day, 10th September 2023

Two teams took part, with six pilots for the red steamer team and five pilots for the yellow streamer team. The combat flying time was four minutes.

Points awarded:

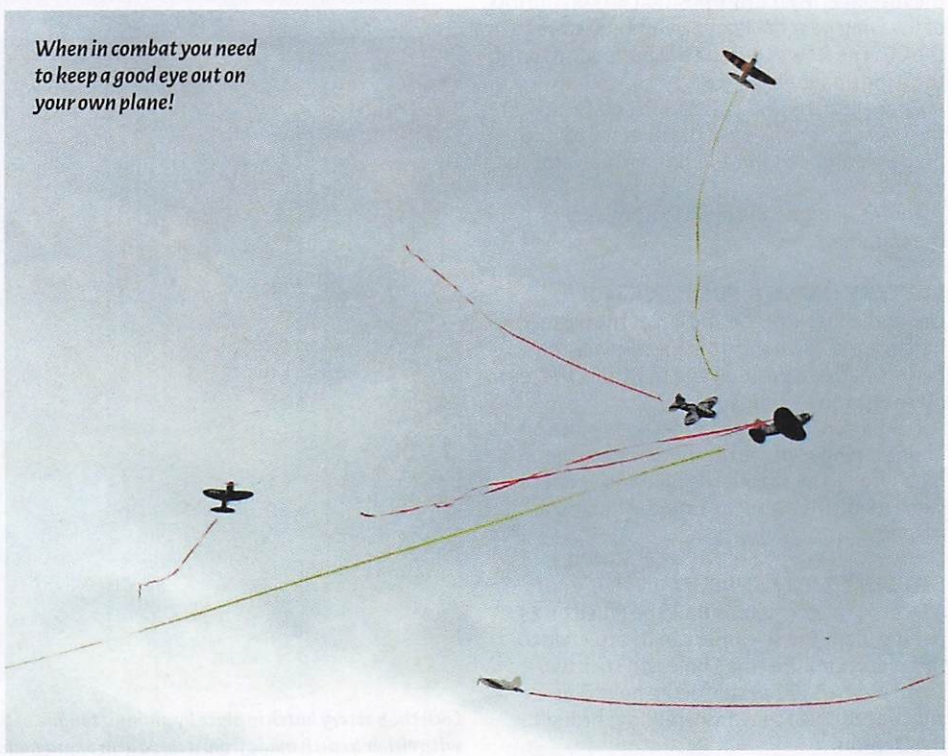
Each streamer being cut. A victory! - 2 points
Surviving without own streamer being cut - 1 point
Bonus points for cutting more than one opposing streamer. An ace! - 2 points

Points deducted:

Not returning (crashed!) or landing on the runway after combat - 1 point

A safety briefing was given and a flight line controller stood behind the teams to command when to launch, call out the time and land. After launching each team flew to their holding area (each end of the runway) until all were assembled and the command to start combat was given. Two observers stood behind each team to record results and watch out for safety issues.

> "It is very agile but is easy to control for an average A certificated pilot"



When in combat you need to keep a good eye out on your own plane!

Basingstoke MAC members line up with their immaculate Spittys and lookalikes. Some didn't stay that way for long!

Winner of the Deluxe Materials sponsored Spitty was Jim Vart.

RESULTS

Team	Streamers cut	Surviving	Deducted (off runway)	Bonus x2 cut streamers	Total
Red (6	2	4	0	0	8
Yellow (5)	2	2	-1	0	5

John Bristow of Deluxe Materials presented prizes to the winners of the best Spitty build competition. First was Mike Roberts with Colin Low second. Winner of the Deluxe Materials sponsored Spitty was Jim Vart.

I wish to thank Deluxe Materials for sponsoring our 2023 project, providing interest and incentive through the best model competition and the Spitty raffle. As one colleague said, "The main thing is that it people got to actually build something from scratch. Many of those with little or no experience of building."

Thanks also to Peter Love and Alan Haskell, part of the team that supported the research, organisation and editing.

In summary, Spitty is a really good flyer and even flying out of combat with its streamer flowing behind is great fun. But a word of warning when in combat - do keep a good eye on your own plane! ■

Scan this QR code for the full-length version of this article, including many building tips.

Colin Low was second with his neatly airbrushed P-47.

DATAFILE

Name:	Spitty
Model type:	Foam combat plane
Plan available from:	www.flugmodell-magazin.de
Wingspan:	656 mm
Length:	580 mm
Flying weight:	290 - 325 g
Power system:	1400 - 1450 kV brushless motor, 30A ESC
Prop:	To suit motor: 7 x 6, 8 x 6, 7 x 5
LiPo:	3S 1000 - 1300 mAh
Servos:	3 x 6 - 9 g
Functions (servos):	Ailerons (2), elevator (1), throttle (ESC)
C of G:	50 mm from L.E. (60 mm on plan)
Aileron throw:	+/- 13 - 18 mm
Elevator throw:	+/- 15 - 20 mm
Expo:	20%

John Bristow of Deluxe Materials presented prizes to the winners of the best Spitty build competition. First was Mike Roberts.

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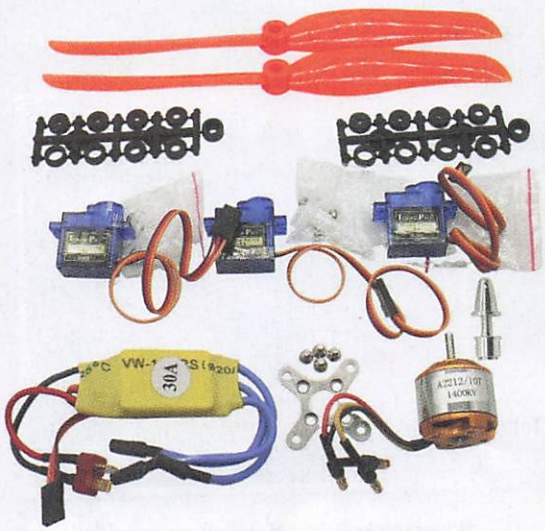

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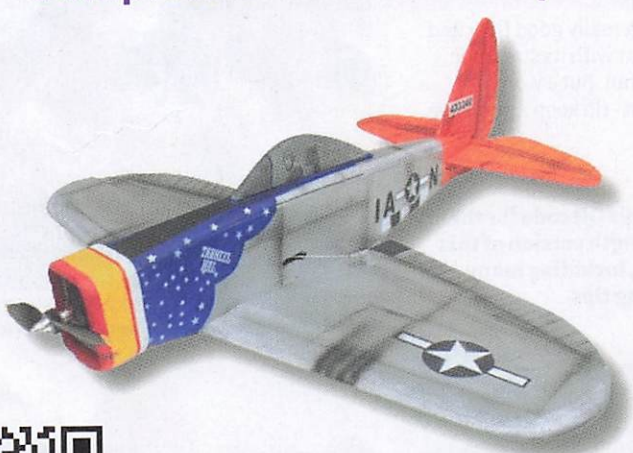

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