Spada GoFast F3f Building guide.

Sebastian Franken with the Spada. Picture courtesy of Composite Radio Control Gliders.

First, a sincere note of thanks from me:

Hello discerning flyer, and now owner of a Spada F3f Model sailplane.
I'd like to thank you for choosing the Spada. A lot of thought, much testing, a whole slew of theory and calculation, but most of all a heck of a lot of experience went into its design.

It's different, certainly not a "me too" and I have to say I am really happy with the way it came out.

I believe that your Spada will reward you by making you giggle insanely, while grinning so hard your head might be at risk of falling in your mouth – which event, is actually a good thing. But most of all I hope it brings you much joy and real fun.

Red Jensen with the prototype Spada after its first flight.

Spada F3f GoFast Racer 118" Info/Technical Specs.

Spada basic information:

I designed he Spada to be the follow on to the Redshift F3f which was modestly successful but with experience still needed some development. So, taking the useful feedback from the top pilots who flew the original plane, I designed the Spada racer. This is a slimmer, lighter, stronger, bottom-loading version of the Redshift F3f - but it's so much more than just a solo racing airframe.
Now with a few more new improvements from the original design spec, like harder layups and a double sine wave spar as standard - while the new super light Aeroic carbon tissue skinned tailplanes help to keep the model robust.
Test flying was conducted in the USA by Aeroic Test Pilot, Red Jensen and the model is really fulfilling its GoFast designation. Its faster overall, accelerates instantly, turns tighter and has more energy retention potential than any model I have ever designed. In short, it's a pure-bred racing plane.
With its optimized Optimum Lift Distribution (ODR) planform and low drag/High response aerofoil set, the Spada really snaps. Built to withstand the rigors of F3f or MOM racing, Spada is fast, agile, easy to fly and generally operate, with no bad habits plus being really stable under flaps and easy to land.

Construction: GFK/CFK Hybrid (Aeroic)
Wings: Carbon with Aeroic Sine Wave Spar - SS version has a double carbon/double ASWS
Fuse: Strong Carbon/Kevlar Reinforced Glass (2.4Ghz friendly)
Tailplanes – carbon tissue skinned.

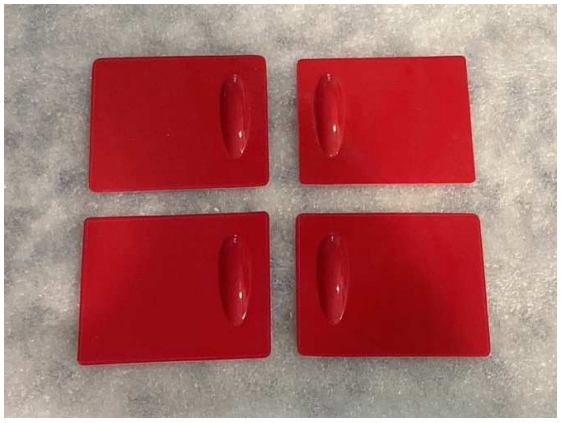
Specifications:

Span:	3.0M (118")
CG:	100~105mm
Length:	1.495M (58.8")
Wing area:	42.98Dm/2 (666.19 Sq/In)
Tail area:	5.8Dm/2 (99.9 Sq/in)
Total area:	53.8 Dm/2 (833.9 Sq/In)
Wing Loading at 4Kg (8,8 Lb) AUW	74.39g/Dm/2
Aspect ratio:	19:1
Wing aerofoils:	JH3580, JH3575, JH3570
Designer:	Dr. James D. Hammond

What's in the box?

Hardware:

Covers and wiring loom:



a. Loose Hardware package – Spada/IDS servo:	**Used for?**
1. 2mm x 5cm threaded rods (2)	Carbon rod servo connections
2. 2mm x 2cm threaded rods (2)	Carbon rod V-Tail connections
3. Clevises (2)	Fuselage servo connections
4. Ball type control rod end (2)	V-Tail connections
5. V-Tail actuators (2)	V-Tail connections
6. Servo covers (8)	4 x flat and 4 x bubble
7. Wiring loom (1)	Servo connections

b. Loose Hardware package – Spada/normal servo	**Used for?**
1. Servo trays (4)	Servo mounting
2. Control horns (4) 2 x flap, 2 x aileron	Control surface actuation
3. 2mm x 5cm threaded rods (2)	Carbon rod servo connections
4. 2mm x 2cm threaded rods (2)	Carbon rod V-Tail connections
5. Clevises (2)	Fuselage servo connections
6. Ball type control rod end (2)	V-Tail connections
7. V-Tail actuators (2)	V-Tail connections
8. Flap connection clevis/rod assembly	Flap actuation
9. Aileron connection Clevis/Rod assembly	Aileron actuation
10. Servo covers (8)	4 x flat and 4 x bubble
11. Wiring loom (1)	Servo connections

Before you start: PLEASE Read me!

PLEASE do read through this instruction document carefully, and identify all of the parts needed and the work to be done. Make sure you thoroughly understand it, and if there is anything you are not completely sure of - then ASK Red Jensen or I – we're always happy to help.

Working surfaces:

YOUR model has a nice high polish, and unfortunately its quite easy to get scratched by sharp tools, abrasive paper, or your wife's fingernails – when she finds out he much you paid for it. - Even a slightly gritty surface can scuff the paint. So, always use a cradle or at least a soft surface to lay your parts on when working – anything might do – an old blanket, just as long as it won't scratch your new baby.

Note: Those nice soft towels on the building table.

Glues not to use in construction:

THERE is no place on this airframe for 5-minute epoxy or hot glue. Please don't use these. Yes, they may save time but I can assure you that you'll spend a lot more time repairing the plane if they fail, and at worst you won't be able to.

Glues to be used in construction:

SLOW Epoxy, or failing that, slow epoxy, or as an alternative, slow epoxy.
Cyanoacrylate – "Zap" good quality and used in very small gaps, or for "tacking" components in place before securing with Epoxy.
I have heard good things about Gorilla glue but I have never used it, so I can't recommend it.

Preparation:

- ALWAYS try to keep the surfaces to be secured clean and especially free of dust or any form of oil – ESPECIALLY - silicon oil or wax.

- Always prepare the surfaces to be bonded by light abrasion, and then by degreasing with good alcohol (no, not the single malt variety) or acetone etc.

- Always make sure that the components to be secured fit well, with gaps as small as you can manage. The fuselage installation:

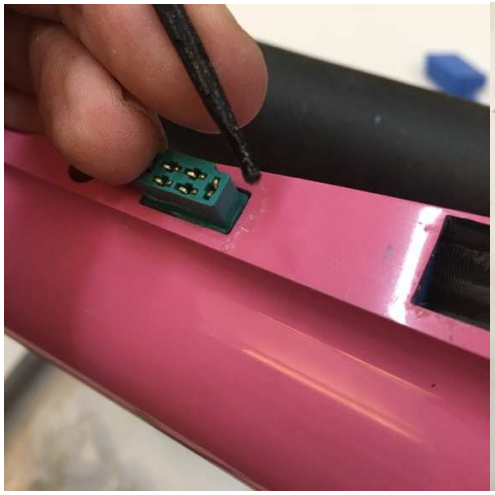
Fuselage fit out:

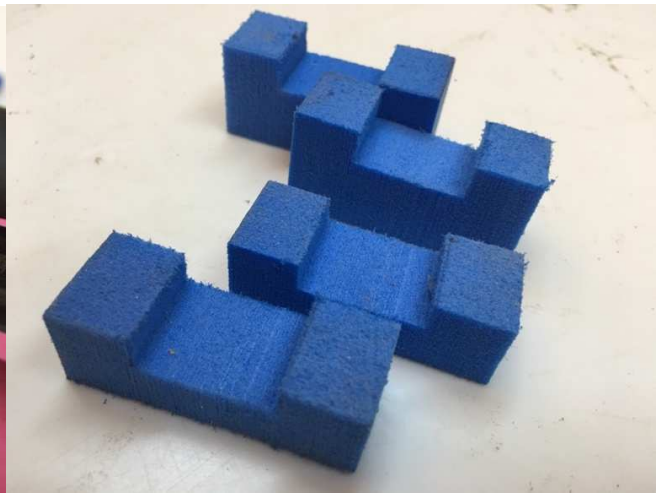
Note: A Radio tray is not supplied, but one can be fitted and may help to add strength to the front of the fuselage. The material can be 3mm ply or 3mm G10 glass fiber plate if you don't mind sacrificing a few saw blades.

Note: A fuselage ballast tube is not supplied as ballast can go in the wings, but one can be fitted in the fuselage if desired. Please make sure that the ballast tube – if fitted – has its centre at the CG position Ca 100mm from the wing LE.

If you elect to design and fit your own radio tray then CHECK that the battery, receiver and servos all fit well and trim to suit if needed (The radio tray, NOT the battery, servos and receiver). Then check to see that the tray fits inside the fuselage on top of the spruce rails. If all is good, then epoxy it in, but try not to get any epoxy on the wires. I sometimes put a bit of shrink wrap or suitable plastic tube on the wires (but don't shrink it.) to provide a little protection.

NEXT I usually make some Depron or other foamy type connector wire keepers to bung inside the fuselage wing stubs to prevent the wires from obscuring the wing joiner orifice. Note that these are cut about 20% larger than the space they have to go into, both are different sizes, and they have channels cut so that each side holds down the wires, etc. well but do not obstruct the carbon control rods. Bingo! wires and tubes now firm and secure and not obstructing the ingress of the wing joiner or the control rods.





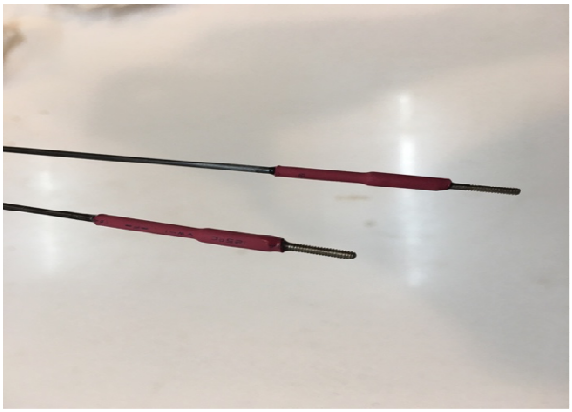
Before adding the wire keepers, carefully file out the Multiplex plug orifices and fit the fuselage wiring loom. The plugs can be fixed with thin CA carefully applied on the end of a sharpened stick or toothpick etc.

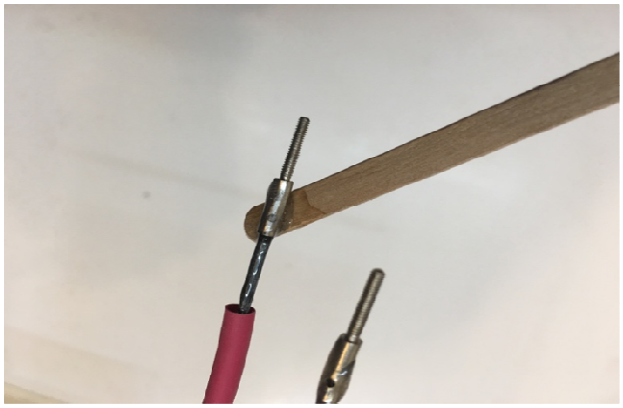
NOW Please check again that the wire keepers retain the wires but don't foul the Carbon Control rods or the wing joiner.

NOW it's time to get the control rods sorted out. After many years of using carbon rods and plated brass clevis/ball joint leaders, I have come upon the method that works the best for me: First abrade all the metal clevis rod surfaces lightly - until they don't shine is enough. Then degrease the rod and the carbon tube with alcohol or acetone etc., before using Cyanoacrylate glue to secure rods into the carbon tubes. After that, thread an appropriately sized piece of heat shrink tubing on to the rod and push it back out of the way. Next thoroughly mix up a very small amount of 24-hour epoxy and dab a bit round each rod. NOT TOO MUCH!

THEN slide the heat shrink tubing over the assembly and heat it gently with a heat gun (not a flipping cigarette lighter or a blooming blowtorch!) and shrink it until its tight. It's a good idea to have a piece of tissue or a rag to dab away any escaping epoxy – and there will be some. Neat huh?

This is how I do all my control rods so I won't bother to repeat this elsewhere in the instructions.





LAST, it's time to tidy everything up, fit the servos, and connect the receiver and battery etc. By the way I rarely use switches of any kind. I prefer to leave a connector between the receiver and battery etc., and use a model finder alarm to remind me to disconnect – but it's entirely up

to you.

I normally attach the cute little end cap - don't you just love it? - at this stage. You can tape it, Ca it, or epoxy it – as you wish.

Wings:

Preparation:

PLEASE DO remember to make up your wings on a soft surface. The paint used for the model is actually hard 2-part car paint so it's pretty resilient, but we use a lot of hard tools, mini-grinders, and abrasive paper - not to forget the vengeful wife's nails - all of which can be harmful to the nicely polished wings.

NOTE: We have found that pure IPA has a slight softening effect on the paint we use, so it's better not to use that for cleaning.

Warning - Technical content!

A couple of quick design notes before we go on:

THE WINGS for the Spada have a very advanced planform that is designed to give a good elliptical "type" lift distribution while minimizing the boundary layer departure problems often associated with the ellipse type wing configuration.

Added to that and to make thing even more weird, you will notice that the aerofoil sections are double cusped – that is, as a friend once put it – they have undercamber AND "overcamber". This is a high control response section that is designed to give good reaction to control inputs, so you get more effect for less angle of deflection. Or to make it easier to understand, less drag per given control input/control response.

If you want to know more about this, please contact me.

OK Back to the build:

Flaps Ailerons:

AS USUAL, all this new aerofoil design means penalties, as there is no free lunch. The aerofoils are 8% thick, and have just under 2% camber with the high point at about 25% of the chord – which leaves the rear of the airfoil a bit thinner than “normal”.

The end result of this means that for the ailerons, the new 8mm (5/16”) thick wing servos are easiest to install – and these are in fact what the wing is designed to use. 10mm Servos will fit, but end up being a bit fiddly to install.

Note: For flaps, 10mm thick servos will be no problem.

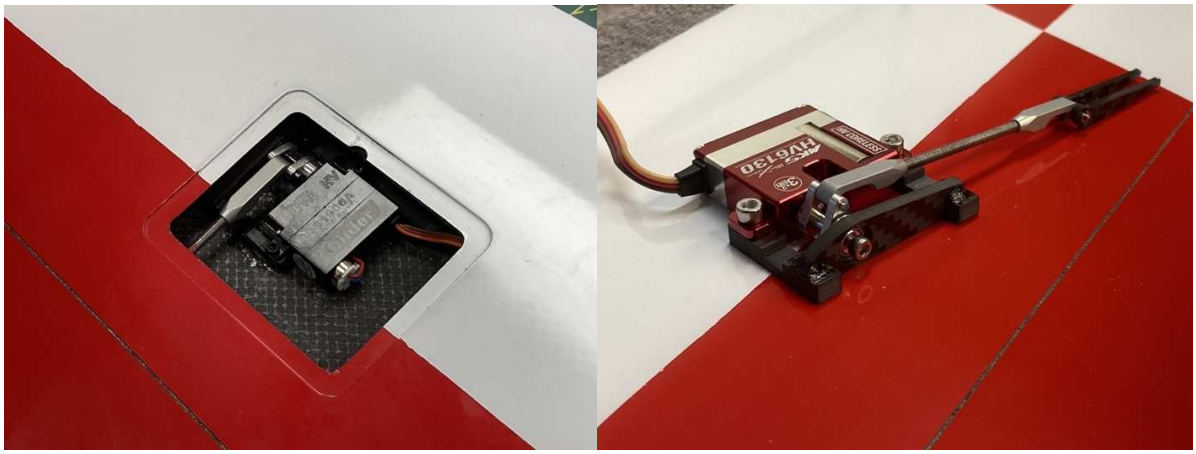
Start by spotting the servo mounting holes on the servo frames – either the ones supplied, or any you wish to use. Then drill the correct sized holes through the frames and trial fit the servos, checking to make sure that the mounting screws do not protrude through the bottom of the fames. If they do then just file them off. Sometimes I have found I necessary to file a small clearance on the side of the frames to let the servo wires fit freely.

Note: If you are using 10mm servos you will need to trim the servo hatch mounting area to allow enough room to get the servos and frames in.

Note: the model can have IDS, or IDS with control horns, or just plain old fashioned servo/control horn servo installation.

TRIAL FIT everything! Make sure the whole assembly fits where it should, and that the servo arms will line up with the control horns. If anything needs to be fettled, adjusted, or modified – now is the time to do it. Also, please don't forget to roughen the undersurfaces of the servo trays to provide good adhesion.

NOW it's a matter of degreasing the pocket insides and the servo trays then bonding in the trays with epoxy. I find its best to do them one by one even if it does take longer as this part is important.



SERVO HATCHEs supplied are very slightly too large to fit the servo pocket recesses, so you will have to sand them down to fit. I normally save a little time by snipping off the sides to within a couple of millimeters of the correct size and going from there.

LAST, PLEASE thread the servo connector harness through and connect the servos. To keep things tidy and not too loose I put some Depron “keepers” where I can to hold it in position inside the wings. Ever since I was a baby I have hated rattles. Don’t be tempted to glue the connector into the wing. It’s hard to get correctly aligned and really not necessary.

Done, your model should look like this:

Spada GoFast Controls etc.:

1. Dimensions in millimeters
2. Angles in degrees

CG	Conservative/start 98mm from LE. Later 100~105mm

General flying:

Parameter:	Position up	Position down
Ailerons	+18	-12
Elevator	+5	-5
Rudder	+10	+10
Flaps		-80º
Snap flap		-5

Butterfly:

Flap		-80 º
Ailerons	+5	
Elevator		-4

Enjoy! And lease take a look at our website www.aeroiccomposites.com and send your picture with your model and some really tasty, scantily clad, female so we can put it up in our owners gallery.

James Hammond June 9th 2024.