



## Yellow Spitfire Notes & Tips off the Web as of 2010-04-05

Build links to Yellow Aircraft build threads at <http://spitfire9.com/yellowbuild.htm>

### Adhesives

The best adhesive to use is a Styrene based type (PFM, E6000, GOOP, etc.). Once applied and cured, the glue joints will not fail. Hysol works too, but is expensive. The E6000 is avail from WalMart craft section for cheap.

As others who have used these types posted, these glues really stick to the surfaces, and the glue joint formed WILL NOT fail, unless of course you destroy the acft.

I second the recommendation for Hysol 9462

Use E-6000 for ply interior parts in glass fuses. It stays flexible for decades, but holds things like canopy latches, servo trays, etc incredibly firmly.

You may have to go to a plumbing supply store to find it. It's made by the Ecclectic Corporation.

I used Hysol 9462 (Aeropoxy) on many of my customer builds, great stuff but being epoxy based it tends to shrink more than some products, and this leaves a line on the fuselage over time where the former is fixed - even if the fit is really nice you will still see the line.

Recently I have started using Metharylates, they are wicked products (weird smell though!), they glue almost everything, shrink way less than epoxies and set to structural grade bonds, two products which you might find useful Devcon 530, a really fast 5-8 min set MA for jobs requiring fast fixes but are not key structural components, and Devcon 531 which is a 20-30 min handling cure which can be used on anything.

I found this product at Lowe's today for 5 or 6 bucks. The first ingredient is "Methyl methacrylate".



Ok, I have done some samples and here is what I found. I took small blocks of wood and glued them in two ways.

First I applied some glue on the surface of the block and pushed it down on the polyester glass surface so that the glue was squashed between the two surfaces.

The second test was just applying a bead of glue in the corner of the block where it came in contact with the polyester surface.

I did these two tests because some formers are already installed and I would not be able to get between them to apply the glue.

So here is what I found,

In both cases the Methacrylates type glue held with exceptional strength. I also used polyester resin. It held well but I was able to peel it away from the surface it was glued to. It took a lot of force, most of which the model may never see but I wanted to see how much it could take.

The Methacrylates based glue was really stuck. It really gave me the feeling that the glue bonded with poly resin on a molecular level.

I did the same peel test and broke the wood block before any sign of the glue coming apart from the glass.

I found the glue in a two part plunger from the local hardware store. It really stinks but I think it is worth the trouble.

I do however think the poly resin might have done better had I added the cut cotton

## **C of G Notes**

The plans call for 5 1/4 to 5 1/2

I put it at 5 1/4 at 24# - This bird is astoundingly elevator sensitive when tail heavy. EQ

jj the manual quotes the c of g at 5 1/2" to 5 3/4" measured from the leading edge at the wing root.

## **Control Surface Movement (throws)**

I did max throw on the rudder, something like 45 deg. The ailerons are max throw on high rates(40

deg) and about half that on low rates. The elevators have only about 1 1/2" of throw up and down(about 30 deg) on high rates and half that or less than 1" of throw for low rates and normal flying. When I fly it, I usually have the ailerons and rudder on high rates and leave the elevators on low. All that rudder throw comes in handy on takeoff with that big 3W up front, and I like lots of aileron throw on all my planes for fast roll rate. The elevator is the only critical one and I would only have about 1" of throw for your initial set up and see how it goes. BTW, these are my settings and not those of yellow aircraft.

I set the ailerons for max throw and set that up as high rates. Roughly half of that for the low rates. My max throw is around 35 deg. Set the rudder for max also, you will need it. Mine throws around 40 deg. Elevators have very little throw, about 1 inch up and down on low rates and about 1 1/2 " up and down on high rates. EQ

The instruction booklet says,  
CoG- 5 1/2 to 5 3/4" behind the leading edge at the root of the wing.  
Ailerons- 7/8" up/down  
Elevator- 1 1/8" up/down  
Rudder- 2" left/right  
Flaps- 85 degrees full throw.

### Cowl

Brad here is an idea for a air inlet that will look scale. I have several fiends that have done this same thing and it looks good and works. Some of the Spitfires had a marking painted in the front of the cowl like there letter AKA "M" or "K" and such. So what they have done is cut the letter out of the front so it looks like a black letter painted in the front of of the cowl which lets cool air into the engine and looks scale.

### Attachments



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Here's what I did on my old Pica Spit. I cut a small round hole where that number goes, covered it in fine mesh screen, painted the number on it. You can see the ducting to the cylinder head in the pic.  
Sam

## Attachments



[Click for fullsize](#)



## Engines

The G38 pulled the Spit around well, and pulled through the loops quite nicely. Did some rolls and a couple of Split S's, and other such maneuvers. Needed what were high rates for the ailerons, and the elevator, my high rates are little more than the suggested. Even on high rates with just over an inch of throw, the plane made rolls somewhat slow.

Need 4 clicks to the right and 2 clicks up to fly straight and level, so that was pretty good.. The plane flew well and the G38 did not suck up much gas. I mounted the G38 as far forward as possible. I purchased a short prop hub from B&B. The prop hub is about 1 and ¼ inches long. This allowed placed the G38 really far forward, thus I had to add only about 8 oz of lead to obtain CG. Pilots putting in a DA 50 are having to add 3 pounds of lead. The DA 50 is a much lighter engine with a long prop hub, thus you have to add the weight.

My first Yellow Spitfire had a G-38 in it and had about 3 lbs in the nose to get it to balance. It flew good and the you only saw the spark plug wire hanging out the bottom. The carb stuck out the side though. It weighed 27 lbs. It was plenty fast, but barely made a loop without stalling out. My next YASpit has a G-62 with the servos on the CG. It does have a B&B smoke system on the firewall with the 16 oz. tank as far forward as I can get it. I have an all balsa rudder. I think I will have to add a little lead to the nose(6 to 10oz.)to make it good. I am going to fly it with the CG a 1/4" aft. I am using a fixed tailwheel to save weight and to keep it simple. It will fly this summer. I think a good engine to use would be the 52cc REVOLUTION by Brisson but I dont think it is available yet. I also think the DA 50 is a REALLY good choice but it is a very light engine at 3.5 lbs. Good luck with your Yellow Spitty...  
Keysttrash

My son and I both have Yellow Aircraft Spitfires. One season on each and about 75 flights a piece. They are ZDZ 40 powered. I would choose the same engine again. You may have seen some shots from the NATS and U.S. Scale Masters. They both have about 1.5 lbs. of lead in the nose. Everbody has lead in the nose. You have got to get rid of the lead if you can! If I had to do it again I would toss out all the tail feathers. All of it. Get rid of that plywood! The glass stab included. Go down and buy contest grade balsa and rebuild everything back there as light as you possibly can. I am willing to bet you could get the lead down by over a lb. and make a good flying airplane supurb. Check out my bubble canopy. I could help you with this option if your interested

I had the ZDZ60 and a menz 22x12 prop on mine and is was great to flyer - FF

I'm flying mine with a 3W-70 and it is a great match. Menz 22 x 12. Plenty of power. MS

NEO, I have over 90 flights on my yellow spitfire with a 3w60i single. The only problem I have had resulting from vibration is a small amount of damage around the cowl mounting screws which came loose in flight. I have 3 hinges per elevators half and 4 on the rudder. at 1/5th scale, I think you might

want to add one to each elevator half and 2 to the rudder. Just be sure to minimize vibration by balancing your prop and spinner(if you plan to put a spinner).  
Evan Q.

DA50, DL 50 DEL 55

I built my Yellow spit before the new canopy and put the rear window in myself. Its really not a big deal. You draw the outline and cut the glass away. Once your finished add a little detail back there by adding the floor and the rear bulk head which goes behind the seat. Then install some clear acetate or similar material for the glass portion. Paint your canopy frame and install on to the fuse. I used PFM for this and it turned out very neat. Regards BobH.

Yellow Aircraft Mk XIV - powered by a Zenoah G-38, Airtronics Stylus, Yellow retracts & wheels, pilot by Diane, OEM automotive paint. Finished weight 24 lbs.

Builder Charlie Kiel - Welford, SC (thank you Charlie for doing such a great job).

Documentation from Osprey Publication Spitfire Aces 1942-45  
Mk XIV RB159/DW-D of Squadron Ldr R. Newberry, OC No 620 Sqn, West Malling, 1944

Maiden flight was essentially a non-event. Like all Yellow AC this one was slightly tail heavy - 2.25 lbs of lead took care of that.

Prop testing produced the following results using MEJZLIK

18X10 = 14.5 lbs thrust @ 7.8K RPM  
20X8 = 15.4 lbs thrust @ 7.2K RPM  
21X8 = 16.4 lbs thrust @ 6.5K RPM  
22X8 = 15 lbs thrust @ 5.6K RPM

The G-38 is very happy when flown with the 21X8. No apparent bad flight habits. The G-38 is a marginal engine for the Spitfire. It was chosen because of the rear exhaust porting. I should have used a 3W50. The Yellow P-40 will be equipped with a 3W60... :D Take offs and landings are very predictable. Hope that covers it. If not fire away. DLU

The plane builds into a fine flying machine in stock form. While it is true that a lighter built-up tail section will save counter balance weight I can tell you that it is not necessary. I'd try to keep it lighter, but I would not waste time building another stab and elevators. My first Yellow Spit was all scaled out for competition and it weighed 32 pounds. Yes 32 pounds and it flew outstanding on an OS BGX-1. The ailerons in stock form are fine, no counter balance was needed on either of my two Spits. DO mount your fuel tank on the CG! This will cancel out any nose over tendencies and result in a more fun-to-fly airplane. My BGX with the fuel tank on the CG and running muffler pressure runs like a clock...dead reliable. Properly balanced the model should fly with a slight amount of down elevator trim...like the full size. The nose of the plane pitches down when flaps are deployed, be prepared to trim in some up elevator or set you elevator flap mix to compensate once you have figured out how much is needed. Final note, for your first few landings (until you perfect your three point) wheel land the model, as soon as the mains touch down relax the elevator. With all that wing area it is easy to pull even a 32 pound Yellow Spit back into the air in a thrust deficient state. This technique is easier on your wing tips. Have fun with the model, you will not regret it. Greg  
On the Engine: The ZDZ 40 was adequate. It did fine, but the DA-50 is wonderful! It is your choice, but I like driving hot rods if I have a choice. You can always pull the throttle back. Either engine will still need 1.5 to 2.0 lbs. of lead in the nose to balance the plane out. So weight is not the issue.

Check out the special firewall and cowling modification kit that gets rid of the side seams on the YA Spitfire when you use a DA-50. The installation uses a 1.25" extension from Sierra Giant Scale. I put a picture below. It cleans up the front end quite a bit.

[www.spychallaaircraft.com](http://www.spychallaaircraft.com) select the Spitfire Firewall tab. LS

Regarding the engine, that is a very personal decision and varies a lot based upon flying style. For example, a G38 will fly it fine, but is not enough power for my tastes. I have a FPE 40cc in mine. I think at least a 50cc engine would be better, especially if you like flying long climbing turns. As others have said, extra engine weight is no problem. If I was doing it again, I would look at a 60cc engine, such as the 3W60 or something similar.

Ed B.

I just flew a formation flight on Sat. 8/9 with Dave Szabo at Warbirds Over Minnesota. He is running a Zenoah G-45 powered YA Spitfire that weighs 24 lbs. with a Zinger 18 X 10-14 prop. It was fast and has fantastic performance. I would say that my DA-50 powered machine is only a few mph faster at best. It makes me think I need to try a lower diameter higher pitch prop. Leo

Leo try a Zinger 20-8-14 prop on the 50cc mine in a TFGS P51 flew best with that combo. APC 20-12 also is pretty good on the DA. Good Luck, Kevin

This was an interesting read. Congratulations and great looking Spit! I'm with the gasser crowd as well. Those glows may look nice all cowled in, but I've never seen anything close to the trouble free operation and flight readiness you get from gassers. Sounds like your plane needs some de-bugging and a balance check. I am surprised at the sluggish elevator response you got and the need to switch to high rates. I've always known this Spit to have an extremely sensitive elevator. Maybe you do need to pull some weight out of the nose. On the power end I flew a ZDZ 40 for 3 years and 157 flights. All in all it was OK. Spun a Menz 20 - 10 at 6,900. As of late I started to have a variety of engine problems, so I pulled it and installed a DA-50. WOW! Now I have some power to spare. Even though it is under propped with the same Menz 20 - 10 I wanted to check it out for comparison. It spins that prop easily at 7,800. I put on a 20 - 12 and got 7,000. Still not the right prop. I think the 22 - 10 I just bought is going to be the answer. Loads of fun! The head hangs out on that DA-50, but given the power and fun it generates, I'll take it any day.

Leo

3w-70 for power and functional scale exhaust. Flies great and floats to landing. MS  
Removing the firewall is really not a difficult task at all. In fact, you will be unpleasantly surprised at how easy it breaks free from the fuselage. So really, two purposes are served by this operation: One, you broaden your engine selection choices and, Two, you do a far better job at securing the firewall into the fuselage than what was done at the factory. MS

I concur with Mark here. Even if you don't move the firewall you will probably want to reinforce it with some strips of glass or something. The firewall in my kit was loose and only stayed in place due to the glue fillets on either side of it! CV

## **FIREWALL**

My firewall solution was as seen here. I've only sold about 5 of these. I think it is a good solution but maybe people are afraid to remove their existing firewalls. 1.25" stand-offs and a 1.25" extension, all available from Sierra Giant Scale. Having flown a Spit for years with a hole in the firewall I do like having it all sealed up much better. After 2 years of flying with the extension on the DA-50 I have learned 2 things. #1. You have to replace the aluminum crankcase bolts with steel or you will blow case gaskets. The aluminum bolts stretch under the force. #2. I need more cooling. I was trying to get by with just the top 2 fins showing, it works, but I am getting my engine too hot and losing performance. This spring I will be making a new lower cowl that will supply air to the head. Similar to a NACA duct. This is what I use to do in the past for many years when running a ZDZ40 in here and it worked well. Something to go back to. Leo

I agree that the firewall is not hard to remove at all. I put a detailed instruction on how to remove it out on one of my web sites. You can find it at:

<http://www.globaldialog.com/~spikes/>

The Word Document is called: <http://www.globaldialog.com/~spikes/Spit%20Firewall%20Instructions%20Rev.2.doc>

I started by breaking it up in to smaller pieces with a large hole saw. Then you grab it with pliers and break the smaller pieces out. Not bad at all. Leo

## **Flaps**

Hinges are robarts, I put the pivot point at the hinge block rather than the flap leading edge. The reason for this is the flap leading edge really provides no meat to hinge into, even with additional blocks behind the leading edge.

On the hinge block side (TE) I added blocks to tie into the topside sheeting and provide more than just foam to hinge into.

The only downside to the pivot being here is the gap required for the flap to clear the bottom of the wing. It's about an 1/8", about the same had I used a large nylon hinge as per instructions.

Bill, the flaps on the full size Spit sit in a "well" just as Yellow has it designed but the fixed portion at the trailing edge is very narrow and is probably oversized on the Yellow airplane.

For a test of the flaps I was up about 40 mistakes high. I hit the flaps and the nose went into a 20 degree downward dive. Yikes. For most of my Yellow Aircraft planes, I have to mix in some down elevator with the lowering of the flaps, for the most part YA planes pitch up or balloon with the deploying of the flaps. The Spit went down !!

The Spit went nose down rather quickly with the flaps at 80 degrees !! I got off the flaps and flew around some more. Made some practice approaches and then landed a little hot and went to the end of the runway. But all was OK. I had to go race my J105 sailboat so I only got in the maiden flight.

Bill,

it is a Spitfite thing, not a Yellow thing. Fullsize had about 85 degree of flap which was more of a break than a lifting device. On my 90" spit I have about 8% up elevator dialed in.

what you describe is normal for a Spitfire in my view.

Put in up, and then expect to push the throttle forward as the flaps when fully extended have a large braking effect.

cheers

Peter

A little philosophy .... So I thought, hum ... Do I want flaps that lower to 85 degrees, or do I want flaps that work well and will not put the plane into a tail spin ?? Thus, I set the flaps to lower to SIXTY degrees [ 60 ] not 85. Then I programmed in UP ELEVATOR ... so, when I lowered the flaps to full down the elevator goes UP.

### **Front Wing Spar**

As promised, some pics of the ply spar that I installed in the forward part of the wing to help combat the cracks in the sheeting in this area. First I cut a slot in the foam all the way to the top sheeting. Then I made a 1/16th balsa template of the slot, then cut a spar from 1/8th aircraft ply to the template. The spar was glued in using Elmers ultimate glue. I had to babysit the wing for awhile and wipe up the expanding foam. Once cured, its a solid as a rock. I then taped off the ailerons and flaps and proceeded to glass the wing top and bottom, overlapping the glass past the gear mounts.

### **Fuselage Cleaning**

You could be having a problem with mold release on the inside of the fiberglass. I am currently finishing up a Grumman Panther that had lots of mold release on the inside. I thought I had cleaned it all out using lacquer thinner, acetone, etc. I found out that these solvents don't really affect the mold release. The only thing that works with this stuff is very warm soapy water.

Mold release is usually found on the outside of the fuselage, not on the inside. But some resins are very slick or waxy, so it is a good practice to sand the inside surface and clean with acetone where you intend to glue.

### **Landing Gear Retracts, Rails, Wheels and Shimming Forward**

I would reinforce the gear blocks in the wings. This is a weak spot in the kit. THE gear blocks are attached to inner and outer ply that is anchored in foam. Thats all the support they have. I added some ply that tied the blocks to the foam and to the top sheeting. BobH

The robart retracts as I have in mine work fine and Ive never had any issues with them. The foam tires are rather cheesy but last a suprisingly long time. After 100+ flights, they are just now starting to wear out. I will probably go ahead and get some glennis wheels to replace them soon.

Leo told me awhile back that he shimed his gear to give a little more forward cant when extended than exact scale to help cure the tendency to tip over. He told me that if you don't do it, expect to end up on the nose quite often.

I rake my gears forward a tad bit on my spitfire from the scale location about 1/2 inch and that makes a lot of difference. If I don't I have to keep remembering to hold elevator when I am on the mains. There's nothing worse than breaking the prop and end silly with the tail in the air. The Spychellas are great flyers, it's what keeps them above the rest and they are great builders to boot!

No need to move the rails. Just add a piece of 1/16th ply to the rear rail. This should give you the rake you need without rotating the gear too much in the bay.

Plywood will work fine on top of the rail.

I'd suggest avoiding washers if you can. When installed, the retract housing should evenly distribute the load flat on the rail. Otherwise it's possible that the retracts could bind somewhat. I'd say a shim of some sort that keeps the retracts flat on the rails sort of might work better if it's workable for you.

I'm with Phil on the washers deal. I first tried washers and the gear did bind. I then made hard maple wedges for a nice flat fit. Things have been great. They are made by gluing two square rails to a block of wood at the gear spacing. Then sand the front rail down to a knife point and the back rail measures .260" tall. Then crack them loose from the wood and glue them in the wing. I don't know how anyone could handle this plane on the ground without canting the gear forward. You can either take the hit on static, which is rarely noticed, or take the hit on landings when you drag the nose of the plane down the runway. It is either or.

Just thread a longer allen head bolt into the blind nut and tap the top of the bolt with a hammer until the blind nut pops out of the retract rail. Be sure to engage all the threads so it doesn't strip when you tap on it. Then you will have to redrill the holes at a slightly different angle. If the holes get too big, fill them with epoxy mixed with milled fiberglass and once cured, re-drill.

Here is the gear rail mod I used to strengthen the landing gear. Fortunately my wing was still being built! It's not quite as strong as the previous approach but you don't have to dig out the original formers. Cut a slot 1/8 wide and about 1 and 1/2 inches deep immediately inboard of the inboard brace. Extend slot to meet both dihedral braces. Take a piece of 1/8 ply and insert it into the slot, mark wing curvature on it remove and cut to shape. Use lots of epoxy and insert ply back into slot. Make sure you get a strong joint at each dihedral brace AND behind the original former. (You just cut out most of its foam support!). Also make sure you get the foam off all the wood joints..you don't want to glue just to the foam!

I added a 3mm (1/8 inch) ply shim to the rear support rail and got just under 1/2" of extra forward rake.

At this position the axle is just under 2 1/2" forward of the forward CoG of 5 1/2".

On the Gear: Both YA and Robart make some very nice gear for the Spitfire. My son and I have over 400 log flights on two spits equipped with the Robart gear and do not have one gear failure or belly landing due to the Robart Gear not working. That is pretty surprising, because I would have thought I would have ripped the radiators off the bottom by now. LS

Sierra makes gear for the Yellow Spit, his gear are second to none, awesome stuff!!!!

<http://www.sierragiant.com/prod20.html>

Another source for gear for this and other Spits is Lenny at Shindin Machine: <http://www.shindinmachine.com/SPITFIRE/SPITFIRE.html>  
His retracts are strong and reliable, and he is great to deal with.

Do not forget [Unitracts](#) in good old U.K. They produce very nice U/C units and if you ask them you will get the scale 96 degree retraction [angle](#). As far as I know the Robarts are 90 degree [retracts](#). I haven't seen the Yellow Aircraft U/C live, but from the photo they also appear to be 90 degree units. Please correct me if I am wrong.

I have had both the Yellow Aircraft gear and Sierra Precision gear in my Yellow Spit and in my opinion, the Sierra gear look better and are stronger than the Yellow gear. The Yellow Gear are pretty, better looking than the Robarts, but just not as nice as the Sierra gear.

On most versions of the full scale Spitfire the U/C swings trough 96 degrees, i.e., 6 degrees more than 90 degrees.

The reason is that that the U/C has quite a lot of rake back when retracted and when extended the U/C legs are almost vertical when viewed from the front. This together with the dihedral of the wing requires a 96 degree retract [angle](#). Some of the American kit manufacturers, e.g., Pica, Great Planes and Dynaflyte use(d) 90 degree retracts and a non-scale U/C position and geometry. I don't know about Yellow Aircraft.

< Message edited by **Red B.** -- 6/17/2008 7:19 AM >

## Painting

Markings are now done on the spitty. I taped off with 3m fine line tape and blue painters tape, just like the 109 and Jug and sprayed with testors acryl in Insignia yellow, red and blue. I also made 2 small baby food jars filled with "scale" black and white to use for the markings and spinner. The scale white looks like a dirty cream color and the scale black has some red and white mixed in to make it look faded. Much better looking than black and white straight out of the bottle. Another of Dave Platt's tricks put to good use. I also went ahead and finished the static prop that Ive had sitting on the shelf for several years. All thats left is to weather with wing and fuse and then clear coat. EQ

## Price

SPITFIRE Mk XIV

DELUXE KIT \$515.00

RETRACTABLE SCALE [LANDING GEAR](#) \$365.00

[Fiberglass](#) Static Propeller with Spinner \$100.00

Scale [Cockpit](#) Detail Kit \$31.00

Custom Machined Aluminum Wheels and Tires \$98.00

Pneumatic Tail Retract \$30.00

Scale 5 5/8" Aluminum Spinner with Machined Aluminum Backing Plate \$62.00

## Spinner

Regarding the spinner. I use 6 X 32 hexhead socket [screws](#). The #4's break tooooooo easily.

I use eight (8) 6-32 [button head](#) hex screws. They are not conspicuous and work great. Leo

## Tail

Build new rudder, elevators and horizontal stab to fit using the Brian Taylor Spitfire plans as a template.

See

Firstly I tacked it in place with ZAP to the saddles, taped, and applied West Systems (thickened) using a thin piece of dowl to get a nice concave fillet. When dry I might,,,,, might do the scale panels in primer/filler. See how we go. I have had the elevator control fork sitting on the bench for the last couple of days to make sure I didnt forget to fit it before glueing in the tail.

My spit is running with the glass stab and the 1/8 plywood core elevators and rudder, along with a retractable tailwheel. Mine weighs 25 pounds with 1.25 pounds of lead in the nose. I agree that I could have made the changes and lessen the nose weight, but at 25 pounds, it performs very well with a G-45 and I have no complaints. This is my 6th YA Spitty. I don't see it being worth the effort, I guess, to change all of that. My friend did, and he is at 24 pounds with a fixed tail wheel and 6 oz. in the nose. So, for the pound difference, I'm happy. Besides, I like slightly heavy warbirds. At 25 pounds, I could use a couple more to penetrate the air better. IMHO JQ

Chris, I cut a slot in the rudder post sufficient enough to clear the elevator arm. The rudder is controlled with pull-pull cables and 4/40 ball links on the rudder. Works Fine.. keep the tail light.. I didn't do this but I have seen others cut lightening holes in the elevator and rudder.. wouldn't hurt to do that. I did hollow out my counter ballances on the elevator for what ever that helped?.. I ended up adding 4lbs to my nose using a Moki 1.8 and slimline pittsstyle muffler..The weight isn't a problem thought... BobH.

Hey Cris, I have my Y/A/ Spit in primer but I took pictures to show you how I handled the issue. Also pictured is the home made horizontal stab that I built. It is all balsa and a ton lighter than the one Yellow sends with the kit. Not only was the Y/A horizontal stab heavy, it also was a poor glassing job because it was very wavy and flimsy. I encourage you to build your own. Anyway, hope these pictures help.

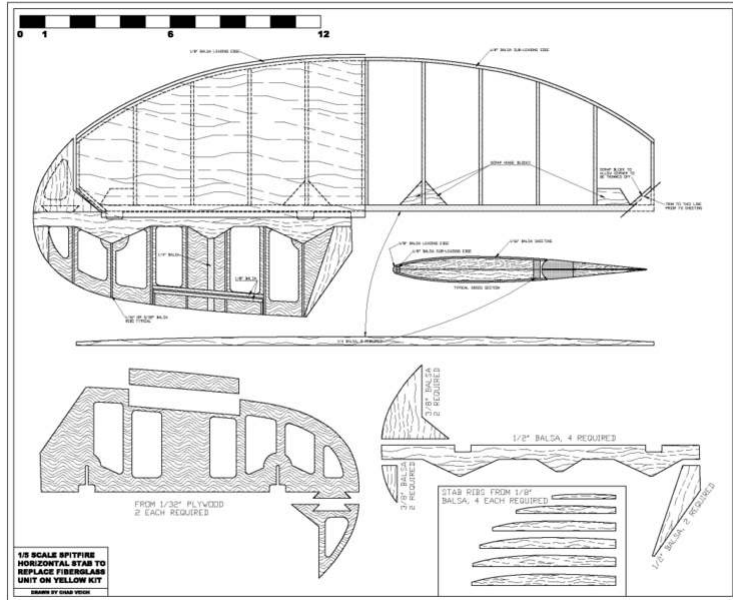


Chris, I too built my own horizontal stab for my Yellow Spit as well as new evelators and rudder. I think the supplied plywood cores are much too heavy and I replaced them with 1/32 plywood and added lots of lightening holes. The fiberglass stab in my kit was also very wavy. I thought maybe I received a bad one but maybe not! Besides the weight savings you can also put the scale hingeline on

a built up stab with little effort. The Brian Taylor plans are a great resource for the new tail surfaces as well as a host of other scale features. Great airplanes, good luck with it.

### Stab

Most of the weight of the stab supplied in the Yellow kit is in the elevators with their heavy plywood cores. It is not a huge job to lighten up the kit supplied parts but my drawing provides a more scale outline as well as providing opportunity to easily add a scale gapless hinge which is not so easy on the fiberglass one in the kit. Last but not least the fiberglass stab in my Yellow Spitfire kit was very wavy and I simply did not like the way it looked.



### Tailwheel

Guys one thing. I was looking at pictures of our tail wheel efforts and noticed that some of the units are mounted a bit higher than others on the former so the pushrod problem becomes evident. When I mounted mine I had to make the former as it was missing from the kit (did you have to make yours??) So I made sure the unit was screwed as low as possible on the former I made. I just left enough space down the bottom for the glue joint. The former was left as short as possible to save weight.

Brad you are right.. checked out the pictures and your tailwheel mechanism is a good 1/4" lower than mine... so you were lucky they didn't include one in your kit//.. probably weren't at the time!! Also makes the dimensions I gave you for the gear door struts a bit off..additionally even tho' my retract gear was a 1/4" higher I still had to trim the control arm to make it miss the fuse side...

My pushrods are 5/32 in diameter and Brad is right the lower the mounting of the gear the better. My pushrod just misses the cylinder with the servo mounted as far right as possible. I tried to get some pic but I need to disable the flash. I will work on getting them up ASAP. I am now fussing with the gear doors for the tail wheel assembly. Merry Christmas everyone!!

Have a look at post #319, there are a couple of pictures there that show what i'm talking about. It sounds like we have it sorted at the moment but for future generations of Yellow Spitty builders this will help.

*Mount tail wheel retract unit as low as practical on the unit former.*

The kit will come with slots already cut into the foam for the kit sized spars. All you have to do is extend them.

Check back in the thread and I show how I achieved modifying the slots.

## **Weight**

I have a YA Spitfire just about to maiden fly here. It was built 'stock' with a full cockpit. (Wish I'd read here before building). I have a new SuperTigre3000, Italian version, for power. The AUW, with 3 1/4 pounds of lead, is 24 3/4 pounds

My spitty weighs 25.5 lbs – EQ

I have the plane but I don't know the wing loading. I will tell you that at #24 the plane flies excellent. No bad habits in take off's, flying or landings. If you use the flaps the plane slows way down on landings. You have to use rudder for take off's and a touch of up elevator to keep the tail down until you build up some speed. The Spit has a very large wing and that generates lots of lift so unless you build your plane super heavy you'll have a good flier.

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BobH.

The 25 lb. spit is not a problem. It is the Super Tiger 3000 that is. I admit a heavy bias on this issue that has been formed from years of viewing Super Tiger flameouts wreck airplanes. That engine is junk and I have never seen one run reliably. Junk. LS

Mine has a take off (32 lbs) loading of at least 56 ounces per sq/ft. It flies with a Moki 2.1 and on the test flight after renovation with the engine running poorly the plane still flew ok after being trimmed. The plane handles the weight beautifully and if the weather clears we will go again with a well tuned motor. If you stay around 24 pounds (well possible) you can have a loading of 41 ounces, if you can keep it down to 20 pounds, that would make this plane almost a floater, I did say almost. This plane has a beautiful wing so I wouldn't worry.

Good Luck

Paul

My son and I both have Yellow Aircraft Spitfires. One season on each and about 75 flights a piece. They are ZDZ 40 powered. I would choose the same engine again. You may have seen some shots from the NATS and U.S. Scale Masters. They both have about 1.5 lbs. of lead in the nose. Everybody has lead in the nose. You have got to get rid of the lead if you can! If I had to do it again I would toss out all the tail feathers. All of it. Get rid of that plywood! The glass stab included. Go down and buy contest grade balsa and rebuild everything back there as light as you possibly can. I am willing to bet you could get the lead down by over a lb. and make a good flying airplane superb. Check out my bubble canopy. I could help you with this option if your interested LS

I did my first test flight and the spit didn't let me down . It flew like it was on rails big time .The ZDZ 40 was an excellent choice for the spit's 25 pounds . Did a few cricuts , a couple loops a few rolls and a worm burner pass .Looked great . It took 2 clicks of up, to trim and 1 click of right . I only had one glitch in the flight ...I had miss routed the carb line and it fell on the muffler . 7 mins into flight I was forced to do a dead stick landing do a hole in the fuel line from the muffler .No trouble there .It surprised me at how well it came in with no power .I actually had to use full flaps to get it to slow down .

Here are a few pics of it a the field fully weathered and ready to go.

KP

Something else to think about is weight and balance.I have a G62 in mine and still needed nose weight.All the servos are on the cg also.Flies great on a G62 and has plenty of power.Just my 2 cents worth. Stuka

I tried very very very hard to make this plane light in weight. It still weighs 24 pounds. Could not believe it !!! I really skimped on the innnnards, and did not build any mounting trays except for the elevator and rudder servo. And poof still 24 pounds.

My first Yellow Spitfire had a G-38 in it and had about 3 lbs in the nose to get it to balance. It flew good and the you only saw the spark plug wire hanging out the bottom. The carb stuck out the side though. It weighed 27 lbs. It was plenty fast, but barely made a loop without stalling out. My next YASpit has a G-62 with the servos on the CG. It does have a B&B smoke system on the firewall with the 16 oz. tank as far forward as I can get it. I have an all balsa rudder. I think I will have to add a little lead to the nose(6 to 10oz.)to make it good. I am going to fly it with the CG a 1/4" aft. I am using a fixed tailwheel to save weight and to keep it simple. It will fly this summer. I think a good engine to use would be the 52cc REVOLUTION by Brisson but I dont think it is available yet. I also think the DA 50 is a REALLY good choice but it is a very light engine at 3.5 lbs. Good luck with your Yellow Spitty... Keystrash

Now for comparison my spit is a heavily detailed scale machine at 27.5 lbs. I am confident that one could be built below 25 lbs. using the balsa tail lightening changes. I don't believe any of the postings saying that somebody has a Y/A Spitfire at 21 or 22 lbs. They either have a bum scale or they have not put adequate lead in the nose to get it to fly well. Something is wrong with that low weight. You have to put the lead up front to get a good flying plane. Running short on lead will give you a plane that constantly hunts up and down in a pitching motion. No fun to fly at all. I've tried it.

At 27.5 lbs. with a DA-50 up front my airplane is like driving a little sportscar around the sky. It will loop from level flight. It has a somewhat heavy wing loading that you have to respect more due to the high speed stall, but the slow speed stall is not a problem at all. I know that my clipped wing tips, which drops me to an 80" wingspan overall, is my main contributor to the high speed stall. You cannot pull it in too hard on the back side of a loop or in a turn at full throttle. It will quit flying and scare you to death as it plummets to the earth. Happened to me twice and I am lucky to still have the airplane. My situation is unique because I cut the wing. I don't know of anybody with a full wing version of the Y/A Spit that has ever experienced this.

## Wing Glassing

I would recommend when glassing the wing to put an extra layer of glass, .75 oz is fine, over the center section around the gear. (wing sheeting is only 1/16th) Mine started to show some cracks in the sheeting around the gear after around 50 flights or so. It wont add too much weight and should strengthen the area. - EQ

Here is how I covered the YA Spit wing.

5 oz cloth from wheel well to wheel well. At the lateral edge I will pull out about a good 2 centimeters of weaving that runs fore and aft. This helps with the fairing later. Let that set up, and the next day sand the edges. I really, really, really squeegee the heck out of the cloth and leave almost no resin in the cloth. Remember that once the cloth has been wet, and saturated, and you squeegee the heck out of the cloth – the glass fibers are still saturated. I will use a deck of playing cards for 99 cents. 2 cards at a time will do half a wing, or wheel well to wheel well. Then the next day sand the lateral fibers [ the fibers out just past the wheel well ] so that the fibers blend into the resin that you will extend another 5 centimeters out so that the balsa is saturated.

Then I laid out  $\frac{3}{4}$  oz cloth out to the wing tip [ TO THE WING TIP ]. I over lapped the 5 oz cloth by about 3 centimeters. A huge mistake that a lot of builders make is trying to fair  $\frac{3}{4}$  oz cloth out on the “fiberglass tip” portion of the wing. Go all the way out to the very tip / edge.

On the top I laid out 2 oz cloth 6 to 7 centimeters past the dihedral joint, and this covered the mounts for the gear.. Did the same with pulling out the fore and aft weaves of fiber, to later make the fairing easier. Let that dry for a day and sand. Then I laid  $\frac{3}{4}$  oz cloth, over lapping the 2 oz cloth by 2 to 3 centimeters. The fairing of this is really simple. And squeegee the heck out of this. You should squeegee so much that you see fibers, not resin sitting on top of the cloth.

Then after that all dries then sand – by hand - just a tad to take off any high spots. Then I did a “hot coat” on the top, let that dry and then did a hot coat on the bottom.

So then this morning I sanded for about 2 hours or more – yikes. I never sand by hand, used to though. I use a 4-inch by 4-inch vibrating sander. The wing looks great. I did the same  $\frac{3}{4}$  oz over the ailerons, as well. LS

Len, I would go ahead and cover the bottom from wheel well to wheel well, especially if you followed the advice of others and added the reinforcement for the “inner” landing gear rails. The reason for the 5 oz cloth is – that if you catch a wing tip pretty hard the wing will break across the wheel well. The other place that the wing will break is across the mid portion of the wing from the inner aspect of the aileron and then thru the aileron servo housing.

Another Tip. On all the YA models that I have built I always place one layer of 2 oz cloth over the balsa of the vertical stab. We all have run off the end of the runway or to the side of the runway, the wheels hit the grass and the plane tips over, and whack the stab hits the ground and on the YA models that balsa will break. Placing the 2 oz cloth on the stab will give just enough strength to prevent this. LS

On wing glassing. I think you should do something. I glassed at .75 oz. over the whole wing. After 120 flights I'm getting small cracks propogating from the corner of the gear mount area. I'm afraid it will fold a wing some day if I haul back hard, but I love hauling back on this bird. She is a nice ride; like driving a sportscar.

did you glass the wing per Yellow's instructions using the 4oz cloth past the landing gear area ? are you saying to add the additional layer to this ?

I inserted and epoxied two 1/4" dowels to each wing side when I joined them together to strengthen it. I then glassed it using .5 oz fiberglass. I put two layers on the middle section then filled the weave with a polyester primer and wet sanded it.

I use .6 oz cloth, overlapped to the wheel wells. I have used this method on all of my models including a turbine model. I use the Dan Parsons method. Dan sold the cloth and he described how he used it. Basically you use thinned epoxy (Thin with rubbing alcohol). Just lay the cloth down and paint on the epoxy. do one 1/2 of the wing at a time. When it has all cured and the edges trimmed, paint on another coat of thinned epoxy. Then just sand until you are almost down to the cloth. It is very light and very strong.

I think that using the thicker cloth is really an overkill. You are building this thing to FLY not to Crash. If you hit hard enough to break a wing covered with 2 oz cloth you will surely do some other major damage.

My wing is only one layer everywhere. No double layers.

You will eventually over-stress the wing as designed. The glass layers on the bottom are not adequate to handle hard pullouts. I have stress cracks in the glass on both sides. I fixed them after about 100 flights with another layer of glass and re-painted the whole bottom. They showed up again. I am at 208 flights and have the cracks. I just pull up smooth and gentle now. The same cracks showed up on my son's Yellow Spit as well. It is a design issue. We are building another new spit now and have changed the whole front spar joiner to carry more load. It is a 1/8" ply spar that runs all the way through the center section and out past the gear mounts in the wing. Lightening holes applied in some areas. From 6 seasons of flying Yellow Spitfires I judge this as a required modification. Leo

I use 2-oz cloth for the bottom of the wing. I overlap it from the tip to about 8 inches outboard of the joint, so that the entire center, plus 8 inches outboard on either side are glassed over with two layers of 2-ounce. Plenty.

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The 1/8" ply spar is plenty, but you need to understand that it stands the full height of the wing thickness. Much like those little ply joiner pieces they give you but all the way through the center section and much farther out into the wing. All the wing cracking occurs right up near the front and this is right where that original spar section goes through. See my highlighted photo of cracks on my wing. Put large lightening holes in the spar as it goes through the center section to save some weight. No hole at or near the intersection between the center and outer wing panels. Bond your spars, wing sections, and joiners with either Gorilla Glue or Elmers Pro-Bond Urethane adhesives. They are superior to epoxy on these foam/balsa/ply structures and the adhesive will foam up inside to fill voids and the lightening holes that you put in the ply. It is like riveting it to the foam. Cool stuff. Leo

## **Wing and Stab Incidence**

The Model Design Spit I am building has +2 deg at the dihedral (measured as there are no documented numbers) however the "destructions" indicate 0 or +1.5 at the tail plane.....think I'll go with 1.5

Check this out Mate. I just placed the center section of the wing under the fuz and set it to 2deg on the bench then slid the tail in and measured it.  
Check out the pics. 1.5deg!!!!!![:)]

I had a chat to Pete (PeteOz) and he knows a bloke in Brisbane who build a MD Spit (that went in after TX batts went flat) and +2 on the main plane and +1.5 on the tail is the way to go.  
Looks like it is the common formula [:

There is no reference to incidence on the actual Yellow plans, but there are figures stated on the scale/reference drawings supplied with the kit. They state "2 Deg to the dihedral break to -1/2 at the tip"

There was no figure for the tail at all.[:o]

## Wing Tips

I'm very leary of putting foam in the tips. We did the same thing on some wings here at work and after a week of drying, still expanded when left in the sun. It got real ugly and deformed. Glad it was the boss' idea

The fiberglass wingtips I received with my kit were pretty flimsy. I bought some of that expandable foam in a can that is used as plumbing insulation, and filled the hollow tips with it. Much more rigid and remained very light. Just be sure NOT to put too much foam in because if you do, it will rupture the tips. Fill the tips about 20 to 25% and the foam will do the rest. Be sure to drill vent holes for the foam to escape from. When it cures, it is very easily sanded clean.

At last I got the Spit in the air, maiden flight was just great. Some trim was needed on elevator (three click down), and some ailerons..

(Picture below shows the wing profile in a hard bank) Leo

A big day today also. After a final incidence check (1 1/2 deg) and some protective taping I committed to gluing the tail plane in for good.

Now I am waiting on a reply from the mob who I will hopefully get the chart tape off so I can do panel lines. I am gearing up to paint some primer at last.

Cheers,

Brad

Attachments



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