

# SPEARHEAD JR.

## STU RICHMOND REVISITS THE ROARING FORTIES WITH AN R/C VERSION OF A TIME-HONOURED VINTAGE QUICKIE



*Spar / rib assembly pinned to the plan with the leading / trailing edge added.*

*Tail surfaces are built directly over the plan - quick and easy.*

I've pylon raced from 1970 until recently - I've had lots of fun, won a few prizes, travelled, competed at lots of places and made r/c friendships in many countries around the world. My early modelling days were the 1940s - the WWII days when I was too young for the military and was thrilled with anything that'd fly. When the USA entered WWII, those of us who had Ohlssons, Bantams, Forsters and similar ignition engines knew the engines may have to last a long time, as model engine machining converted practically overnight to wartime production. The American War Ration Board allowed those of us with spark plug engines to buy one gallon of gasoline per year per engine as a way to keep us aeromodelling minded.

It wasn't exactly like the Hitler Youth Program's efforts, but we could have gasoline and could buy tiny carbon

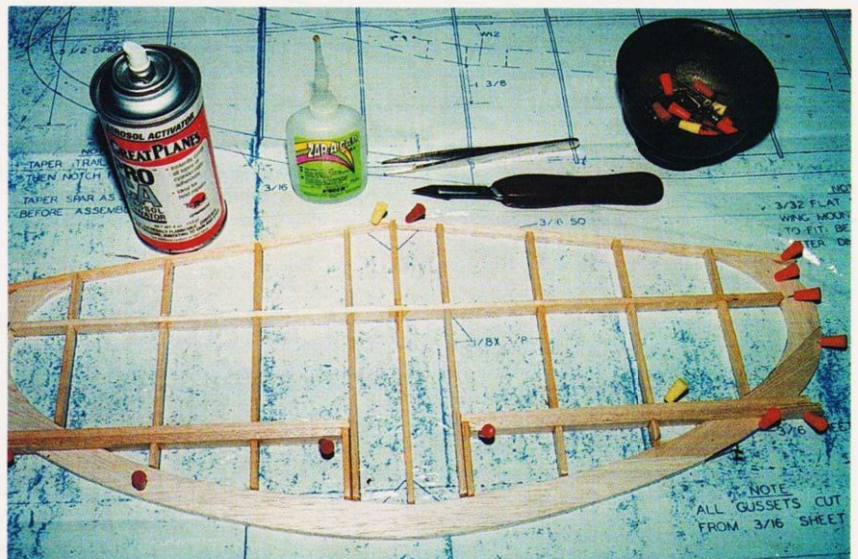
/ zinc batteries for our engines' ignition systems easier than we could buy strip rubber for wind-up models. During those USA days of ignition model engines, modelling on your side of the Atlantic was discovering the magic of model diesel engines... we were progressing in parallel directions.

All during WWII, design / development actively advanced as we all learned more about lifting stabs, undercamber, low thrust lines, spiral stability, adding lightness etc., and the UK / USA engine paths rejoined in 1947 with the advent of Ray Arden's glow plug.

### VINTAGE PLEASURE

But times change - our interests change as we continue to chase our hobby's fun. As my pylon-racing enthusiasm lessened, I found a local East Florida group of r/c modellers who had 'discovered' the joy of flying the old free flight designs by r/c. What's more is that they were competing... and the competition was low-key fun, with vintage era models controlled by modern r/c... this was for me!

So, for the past few years (for contest fulfilment) I've been flying the SAM / Texaco r/c events.

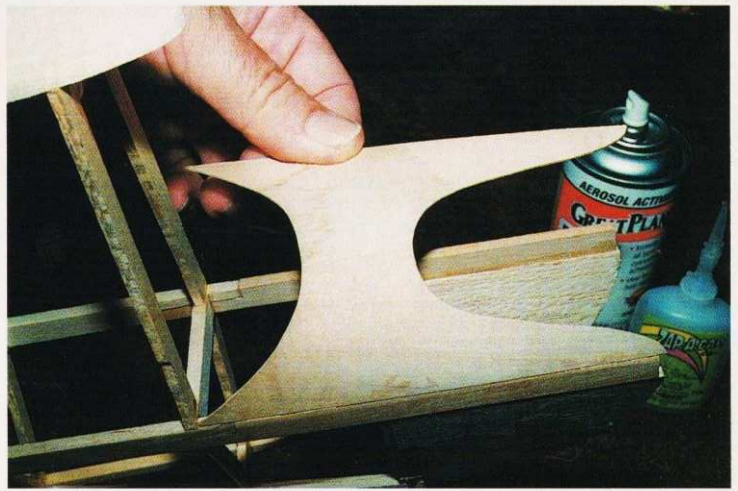


*Built my 1st Spearhead Jr. in about 1943.*

As the fun of r/c advanced we mostly forgot about the 'old / archaic / antique / obsolete days' of powered free flight models.

I'm enjoying new friendships at new flying sites with old design models which still give me the thrill of flight. As what I've built with my own hands circles higher and higher in a lofty thermal, I have a transmitter ready to safely terminate the fun at will... super nice r/c fun!

I was looking through a bunch of old black and white snapshots recently and, from about 1943, I found my favourite model... a Spearhead Jr. by Jerry Stollof. Mine had an Ohlsson .23 and it flew and flew through the war years. It was finally lost in a booming thermal about 1945-6, happy memories. Also, I'd recently broken-in on my test stand a brand new engine - the totally modern redesign of the famous Mills .75cc diesel now made by Irvine. Suddenly '2 plus 2' made a perfect '10'. The light flashed bright... I'd build a new Spearhead Jr., the neat



*Pic showing carbon fibre yarn cyano'd to apparent stress points.*

new Mills .75 would power it, I'd use two of the teeny-tiny new HS-50 Hitec feather servos and the matching 555 miniature receiver would drive from my X-347. With 300 square inches of wing area and displacement not over .049 cu. in. and with a 17oz flying weight, I could SAM / Texaco contest fly the model in the Open 1/2A Texaco event with a very competitive 8oz wing loading - and have bunches of fun too!

**RELAX!**

My new Spearhead Jr. runs 2 to 3 minutes with an 8 x 4" turning near 8000rpm. Climbs are up to 500 feet to maybe 900 feet of altitude. The model wobbles visually in / near lift and full up elevator trim with a bit of left rudder trim allows it to nicely circle in Florida

thermals. Without lift, flight times are near 8 - 10 minutes with plenty of relaxed stress-free air-time; nice. With thermal lift, you can fly to your heart's desire. Airborne battery drain from the 270mAh pack is practically nil - when my X-347 beeps, it's time to land. Real pleasure!

Let's clear the bench, grab the box of mostly scrap wood, spread the plans for our Spearhead Jr... and start building.

**FUSELAGE FIRST**

Fuselage building begins with a flat horizontal crutch, built directly over the top view of the fuselage. The 3/16" x 3/8" side pieces of the crutch should be hard / strong / firm as they become the bulk of the fuselage strength. Cross pieces can be soft / pulpy and I used

rock hard maple at the forward end of the crutch to hold the engine mounts. Bulkhead F1 is from 1/8" ply and the landing gear wire is 3/32 bent to shape and sandwiched / glued to the front of F1 with more plywood. The formers above and below the crutch are built directly over the plan, then removed and glued to their respective positions. Two F10 pieces from 3/16" form the wing saddle and F11 and F12 form the fuselage backbone. I suggest you build as per plans - don't add any more to the structure as the original from the 1940s was considerably heavier than this modern 17oz version - but do select good / firm / straight balsa. If it's not in your scrap box, a trip to the hobby shop is worthwhile. A sheet of 1/64" ply is cut to pattern shape and glued forward of F2 to form the rounded cowl. Add 3/16" sheet below the cowl to complete the front of the fuselage, be sure to leave a bottom slot to allow for fuel drainage.

I added short lengths of strengthening carbon fibre yarn to the rear side of F2 - you might want to add a small strengthening gusset between the forward internal end of the 1/8" wing hold down dowel and the forward side of F2. I decided that a sheet of 1/32" ply would be fitted between F2 and F4 (from the crutch up to the wing saddle) and 4 small plastic screws would hold it in place. The on/off switch mounts to this ply as well as the charging receptacle. Removal of the ply would easily give access to the servos / receiver / NiCad pack and the pull-pull (closed loop) cables too. Small pieces of 1/8" ply are tapped and glued in place to hold the 4 plastic screws.

*(TOP LEFT) A 3/16" x 3/8" hardwood crutch 'front end' is spliced to a hard 3/16" x 3/8" balsa rear section.*

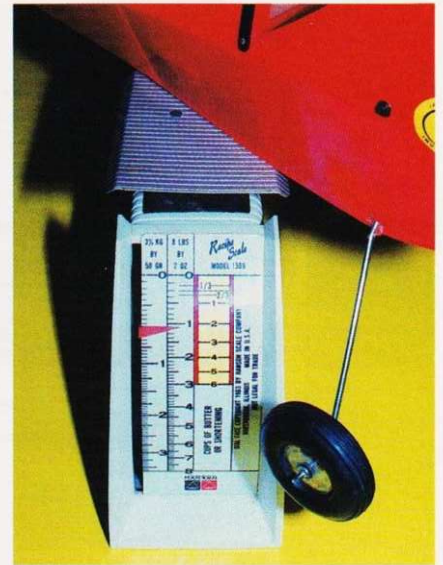
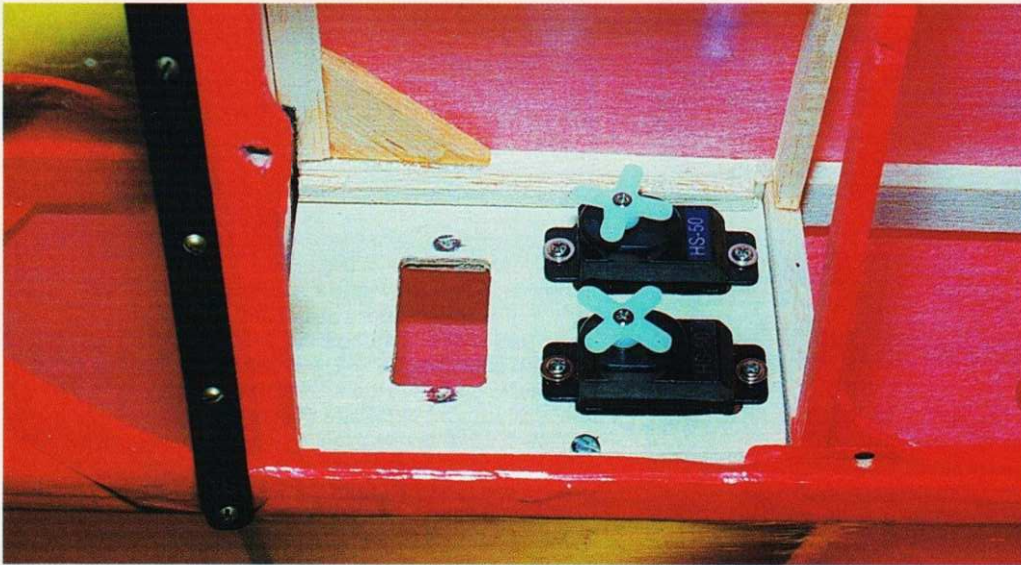
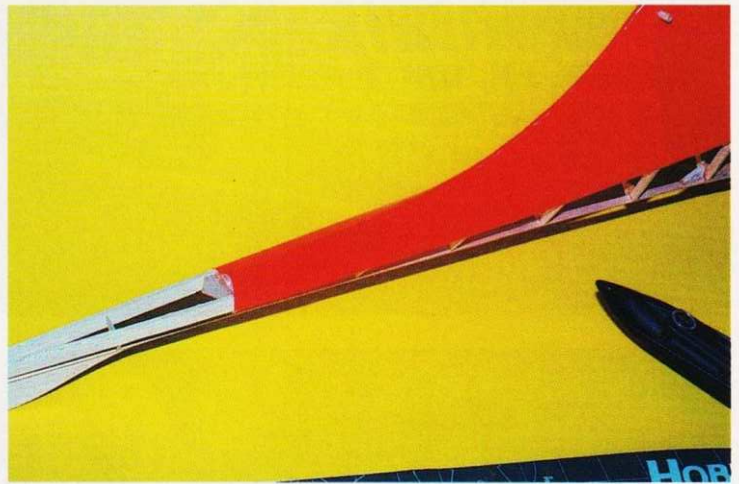
*(TOP RIGHT) 1/64" plywood wraps across to make a neat cowling.*

*(BOTTOM LEFT) Rounded leading edge blocks are clearly visible here as are the 1/16" ply dihedral joiners.*

*Radio access is by a removable 1/32" ply panel held in place with 4 plastic screws.*



Covering the top of the fuselage is made easier with lots of scissors cuts to form tabs.



1/8" ply was used (drilled and tapped) to receive the 4 plastic bolts that hold the R/C access panel. Whilst my model uses a 270mAh battery pack in front of the servo tray with a Hitec 555 receiver behind the servos, it is possible to use larger R/C equipment.

Lightly sand the finished fuselage and set it aside.

**WING UP**

Cut your inner section wing spars from very strong / heavy 3/16" sheet; the outer section spars can be lighter. The full-size frontal view of the main wing spar is shown in dotted lines on the plan. Assemble your main wing spar over the dotted lines, then cut the wing ribs from 3/32" sheet balsa.

trailing edges and wing tip outlines which are then carefully carved / sanded to shape. The wing leading edge should be blunt; the trailing edge should be sharp.

**TAIL DOWN**

The rudder, fin, stabiliser and elevators are built directly over the plan. Please note the stab is flat-bottomed and the top is cambered. Again, leading edges are blunt / rounded and trailing edges are sharp. Sand to completion and set aside.

**AND THE REST!**

Nothing looks as rotten as a glue-smearred windshield; mine was cut as per the pattern and two thin plastic black strips were cut to length, drilled to accept 6 tiny brass screws and a

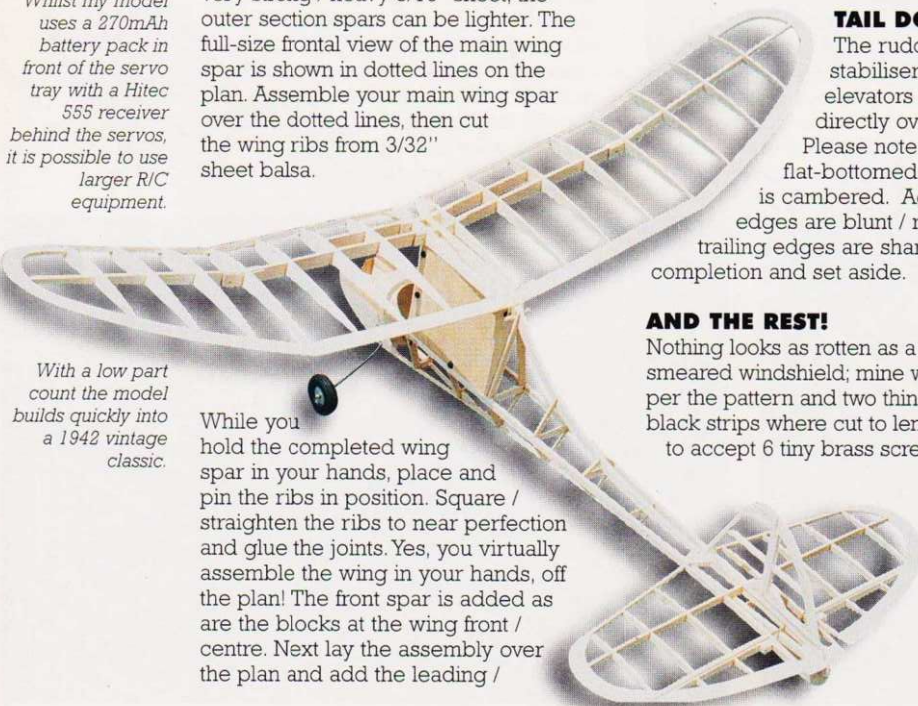
This vintage era new lil' beauty tips the scale at 17 ounces and seems to glide and glide. Lotsafun! Why not build one?

total of 12 miniature brass screws neatly hold the windshield in place (without glue). Behind the right side of the windshield appears my name, address, telephone number and offer of a reward for return - screw-ups do happen!

My Irvine / Mills .75 diesel powerplant is a delight... it was broken in as per the instructions and hand-starts with the needle open 1/2 a turn, 2 chokes and then flip to start. I seldom mess with the contra-piston adjustment. Other engines smaller than .10 cubic inch would certainly be suitable - the aim of SAM / Texaco is relaxed flying.

**RADIO**

I cut a plywood plate to glue between F2 and F3 to hold 3 HS-50 servos (in case I want throttle control) but only rudder and elevator are in use. I set the model for 'down' elevator and full 'right' rudder then switch off. If I launch with the radio dumbly not turned on, it'll crash at my feet rather than fly away - not TOO dumb, huh? Standard size servos would be a tight fit but a 500mAh pack is a little large and may not fit. I balanced mine with the 270mAh pack nested between F1 and F2.



With a low part count the model builds quickly into a 1942 vintage classic.

While you hold the completed wing spar in your hands, place and pin the ribs in position. Square / straighten the ribs to near perfection and glue the joints. Yes, you virtually assemble the wing in your hands, off the plan! The front spar is added as are the blocks at the wing front / centre. Next lay the assembly over the plan and add the leading /

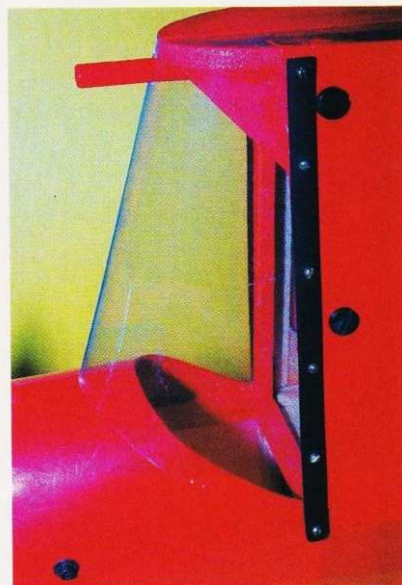
44" span, 33" long  
- just the ticket for  
some low cost  
vintage fun.

### COVERING

We have a variety of covering choices on both sides of the Pond. My personal preference for fuselages and top surfaces is coloured Micafilm that's quite puncture proof, comes off the roll looking like



tissue paper that's had ten coats of clear dope already applied and weighs about 1.03oz / sq. yd. The framework is first painted with Balsarite adhesive and the Micafilm is then ironed to the adhesive for a 100% fuelproof finish. Equivalent Litespan weight is 0.8oz / sq. yd and MonoKote is 2.2oz / sq. yd - the choice is yours. Covering the wing and tail is straightforward, just make sure you adhere the wing's bottom covering to the ribs. I initially covered the bottom of

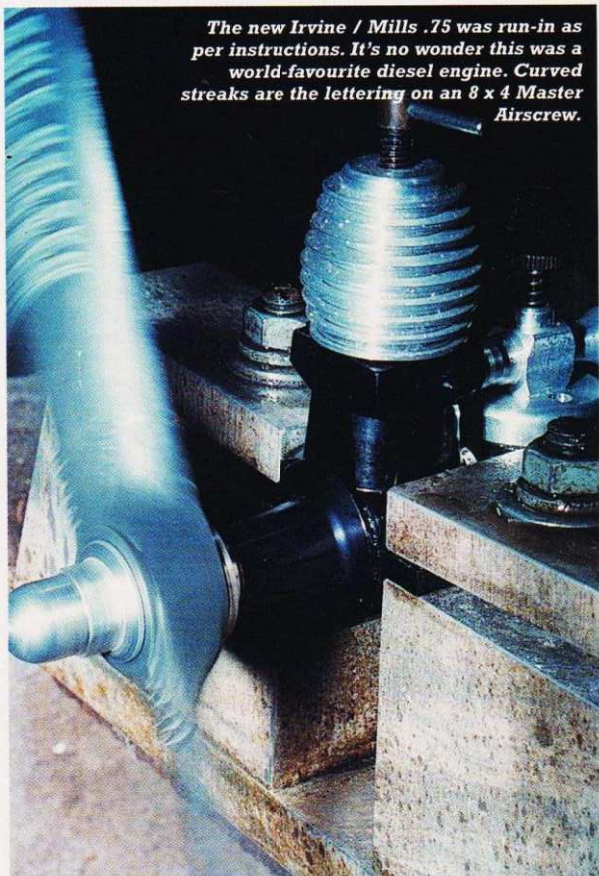


Scrap plastic strips and 12 tiny brass screws hold the windshield in place.

Red 'stick-on' vinyl letters are from the local stationery store.



The new Irvine / Mills .75 was run-in as per instructions. It's no wonder this was a world-favourite diesel engine. Curved streaks are the lettering on an 8 x 4 Master Airscrew.



The minor construction flaws of the original Mills .75 are gone. Tank construction is improved and the rear of crankshaft rides in a bearing - not!

models are black on the bottom and visibility at altitude against clouds is excellent. After a few flights I re-covered my Spearhead Jr. with shiny black MonoKote on the bottom surfaces and visibility is now A1!

### FLYING

Before first flights about 1/8" of washout was twisted into the outer wing sections at the rear of rib W8. I wasn't sure how the engine would pull, so I put the 8 x 4"

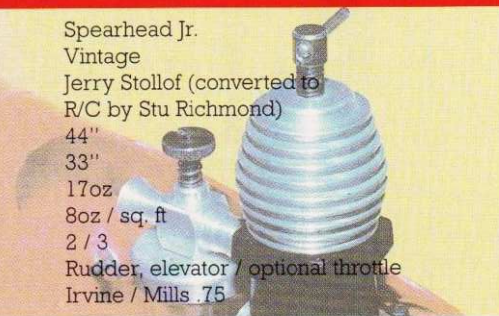
on backwards for the first flights (subsequent flights with the prop on 'the right way' have been fine). The model climbs right on up skyward and is a delight with the control throws as marked on the plans. The Mills .75 has a 3cc tank volume, plenty of fuel for nice Sunday fun.

Please, if you build a Spearhead, Jr., send me a photo c/o RCM&E. I'd love to know if you're having as much fun as me.

### DATAFILE

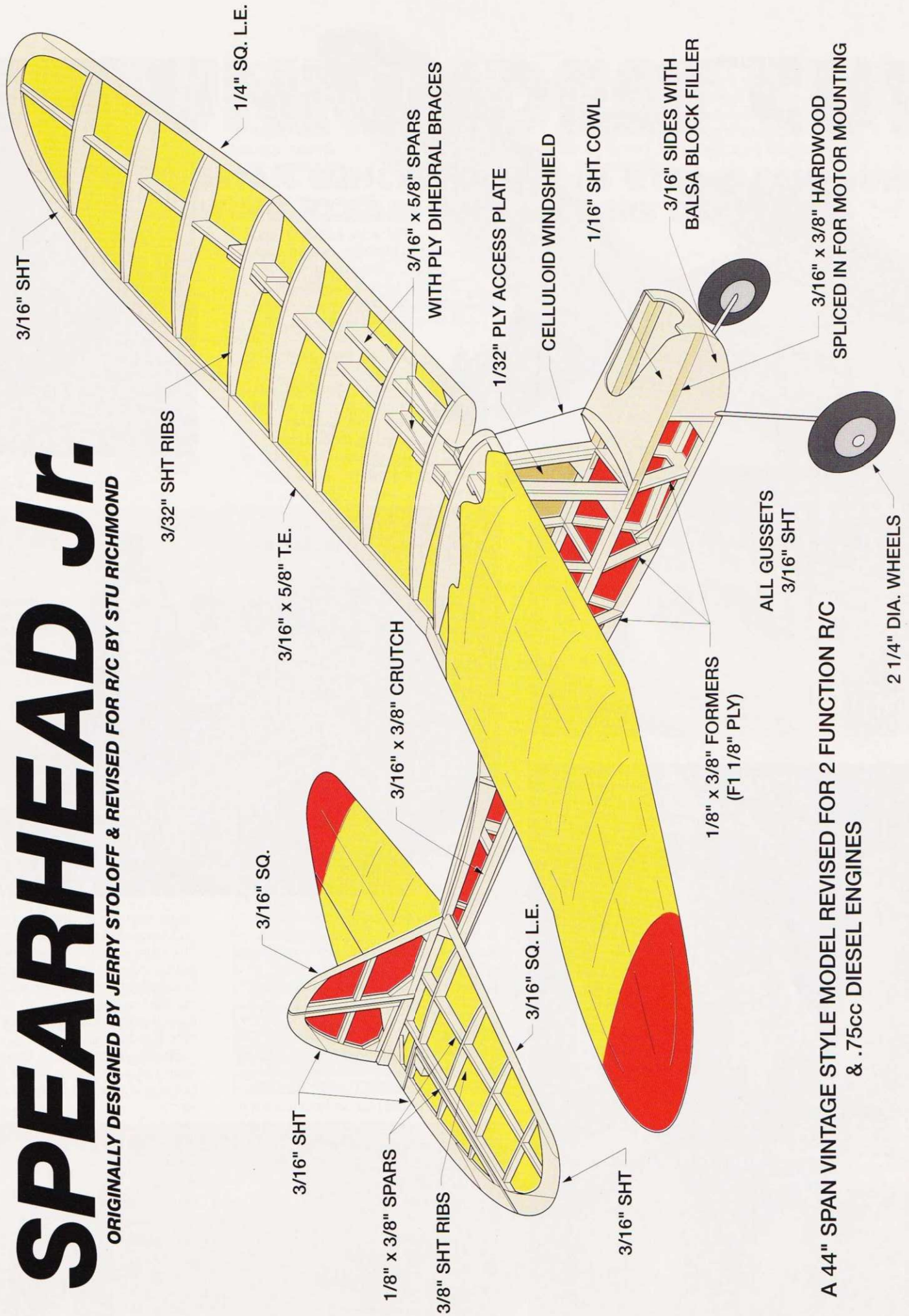
**Name:**  
**Aircraft type:**  
**Designed by:**  
**Wing span:**  
**Fuselage length:**  
**All-up weight:**  
**Wing loading:**  
**Required no. channels:**  
**Control functions:**  
**Engine:**

Spearhead Jr.  
Vintage  
Jerry Stollof (converted to R/C by Stu Richmond)  
44"  
33"  
17oz  
8oz / sq. ft  
2 / 3  
Rudder, elevator / optional throttle  
Irvine / Mills .75



# SPEARHEAD Jr.

ORIGINALLY DESIGNED BY JERRY STOLOFF & REVISED FOR R/C BY STU RICHMOND



A 44" SPAN VINTAGE STYLE MODEL REVISED FOR 2 FUNCTION R/C & .75cc DIESEL ENGINES