

# FROG INTERCEPTOR



*The Frog Interceptor was a small rubber-powered toy aeroplane marketed in 1932. It had a pressed aluminum fuselage and painted paper wings, and though it was supposed to represent a semi-scale fighter, it was years ahead of its time. For power, it had a rubber motor, with step-up gearbox for the small prop. RCM is happy to present Gordon Whitehead's updated version for electric power.*

**W**ell, there I was in our public library, leafing through this book *Frog Model Aircraft 1932-1976* by Lines and Hellstrom to see if any of the Frog flying and solid scale kits your scribe had made years ago were featured. Then, all of a sudden there appeared a whole raft of information on one of the Frog models I had always wanted, but was born too late to get; the Interceptor Mk IV. With the book giving a full description of how and why it was created, a 3-view of all things, and copious color photos, how could I resist? An idea began to

## Mk 4X

**By Gordon Whitehead**

### **THIS IS ONE FROG THAT DOESN'T JUMP . . . IT FLIES!**

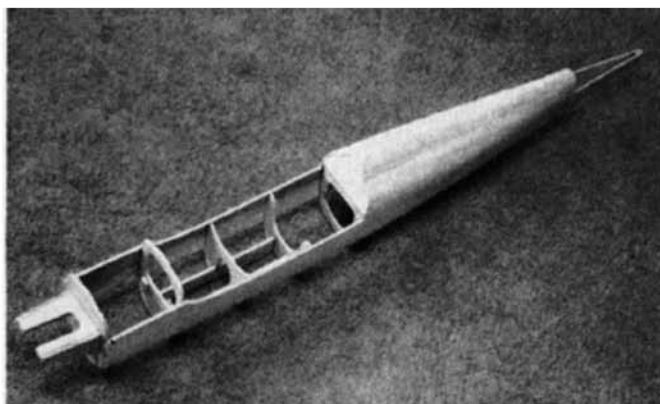
germinate, and with no more ado I checked out the book and took it home.

As many of you will know, the original Mk IV spanned about a foot, and was rubber powered via a step-up gearbox. Imagine (some of you will remember!) the gentle whirr the little beauties must have

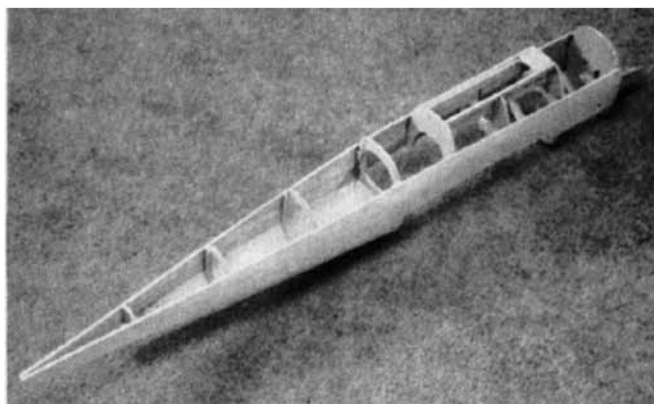
made when soaring away from a hand launch. If I was to make a scale model with scale sound, there was only one way to power it, and a line to the British firm Model Flight Accessories, located at The Mill, Mill Lane, Worth, Deal Kent, England (2 IRCs for reply to letters) describing the idea instantly produced an RX 15 motor and Olympus gearbox, for which a big thank you is in order.

The dining table became a hive of activity. The pencil danced and flew, and the plan gradually materialized. The replica is four times the original size (hence Mk 4X) spanning 46½", and there are some concessions to "scale," and some discrepancies. The 3-view deviated from the photos in classic style, so I went with the pix. The wing section is based on the Eppler 205, instead of the flat-bottomed 1932 o/d job. The landing gear plugs in as per original, but the metal strap retainers are replaced by rubber bands.

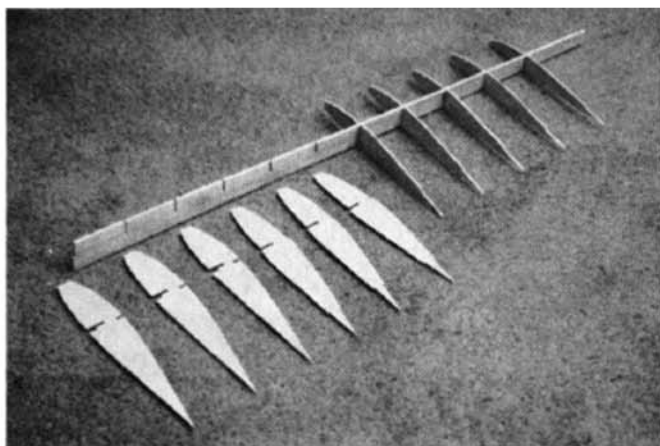
With modern covering technology in the form of Pro-Film Chrome and Solarfilm's Litespan, getting the colors right was no problem. In fact, if you like this model, get



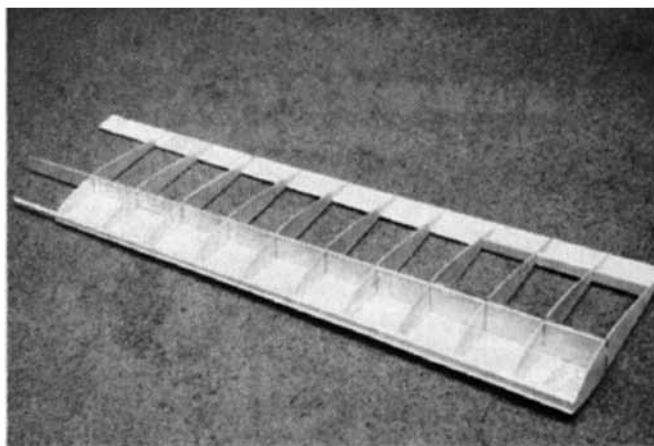
*Initial fuselage assembly with rear decking added.*



*Underside view before sheeting added.*



*Gluing ribs to spar. Keep them at 90°.*



*Step 4 of assembly before pinning back down.*

the Frog book from your library, and check out the available "scale" schemes. Besides the RAF schemes, for which six different squadron transfer sets were available, the original models were produced in the brightest contemporary military schemes of Argentina, Belgium, Holland, France, Italy, and the USA. There was even a

ski-equipped one, and one done in sand/spinach camouflage. After WWII, Frog marketed the Mk V, which featured a "modern" tear-drop canopy and wing-mounted fixed l.g. with Hawker Tempest style wheel covers.

But enough of that. Let's pick the lightest balsa, cut out all the parts, and build. Most

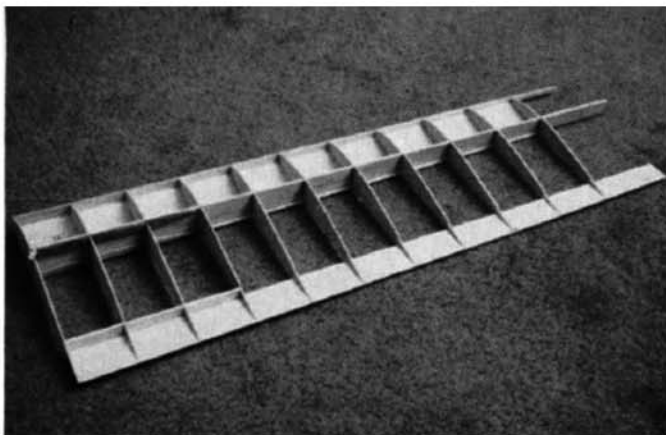
of the essential construction details are noted on the plan, so we'll be brief here:

#### **CONSTRUCTION**

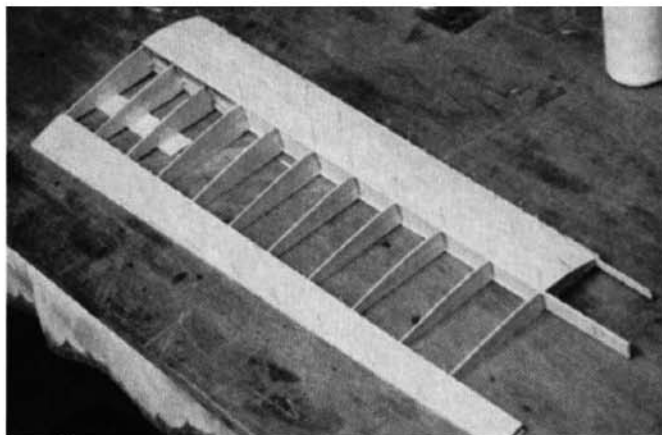
##### **Fuselage:**

When sheeting the rear fuselage at step 5, apply the 1/16" sheet in longitudinal panels, three upper and two lower. Make a paper template of the head-rest/spine fairing

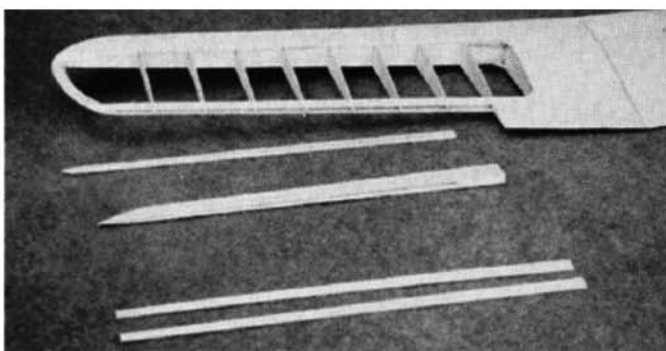




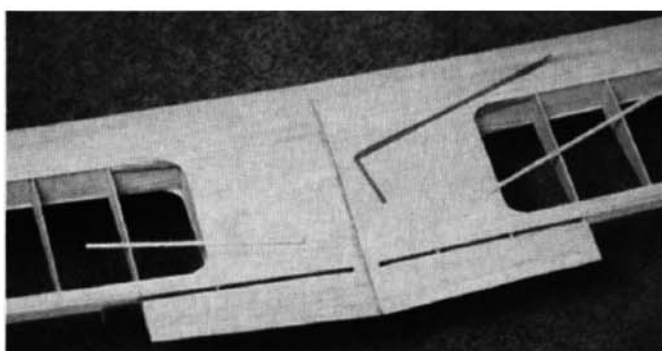
*Another view of partial wing assembly before pinning down.*



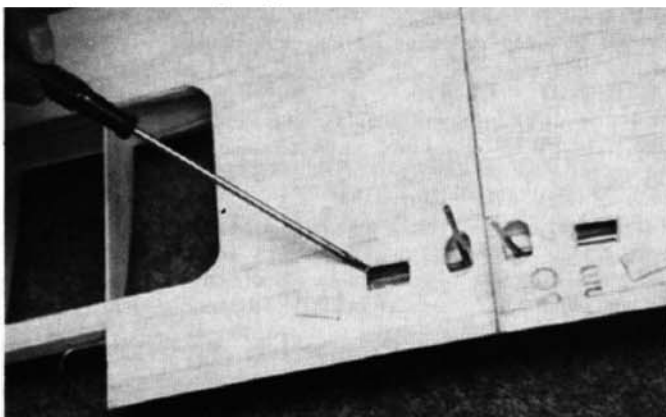
*Top sheeting pinned and drying.*



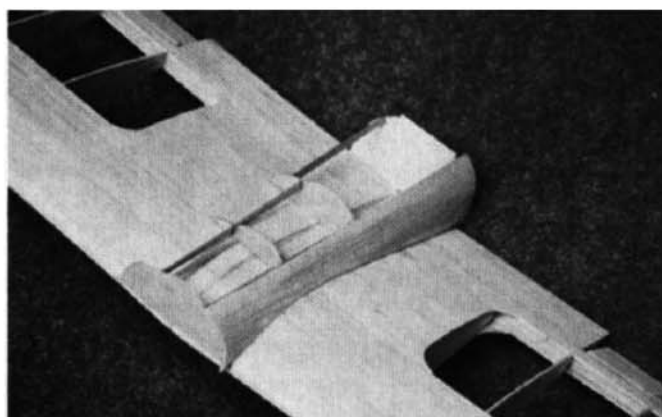
*Aileron cut off, and about to be fitted with hinge blocks (not shown), and webbing strips.*



*Torque rods about to go in.*



*Securing inner torque rod bearing with epoxy.*



*Center section/cockpit fairing assembly.*

directly from the model, cut the wood to shape and glue it in place. Then, fit the 1/16" x 3/16" stringers between the formers, CA them first to the edge of the skin, then at the ends. Ensure that a 1/32" wide edge of each stringer protrudes to support the remaining panels. Trim the remaining panels to size, and CA in place.

Regarding the cowl, first make up C2, and use it to position all the cowl fastening bits on F1 while their glue sets. Then, support C1 and C2 apart with scrap and panel the cowl. The front block and "gearbox" follow next.

The battery hatch uses the lever principle to support the rear of the battery on the 1/16" ply tongue, with the leading edge of the cowl supported by the rear landing gear rubber band.

#### **Wings:**

The wings use a slightly unconventional assembly sequence, described on the plan. The method of pinning down the rear of each wing panel flat has the effect of building in washout. I butt-jointed the panels with no braces, other than a strip of glass cloth glued around the center section.

#### **Tail:**

The photos show a built-up tail. However, that long "rubber job" nose is an embarrassment, and my radio gear is mounted as far back as possible, with oodles of spare space up front. So if I bust the tail off at some future date, I'll replace it with solid sheet.

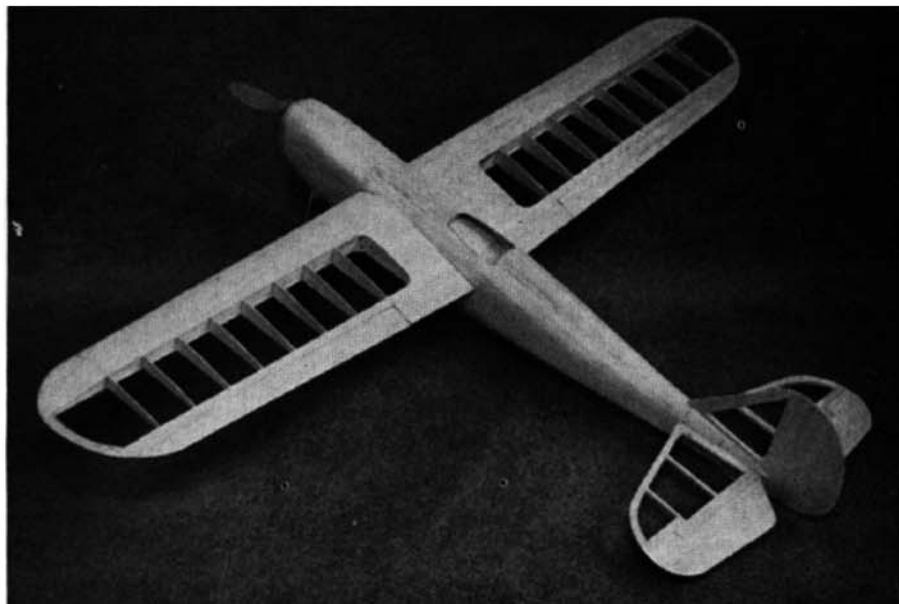
#### **Radio Gear:**

I used what I had on hand, and the airborne pack weighs some 11 ozs., less

speed controller. There is plenty of room for the radio equipment, but the true electric enthusiast with lightweight gear and a modern BEC with drive motor cut-out speed controller could save some 6 ozs. at least on my Interceptor's all-up weight. I ran the Rx antenna directly out of the fuselage by the Rx, and lead it to one of the tail plane tips, as I suspect that one would get shielding if the wire was run down inside the fuselage.

#### **Power:**

For power, you can use any 05/540 motor with reduction drive. The prop used will depend on the reduction, so just follow the manufacturer's recommendations. For our model, we used a Top Flite 11 x 6 prop on an RX 15/Olympus combination. At its 47 oz. all up weight, this model has better general performance than some of the



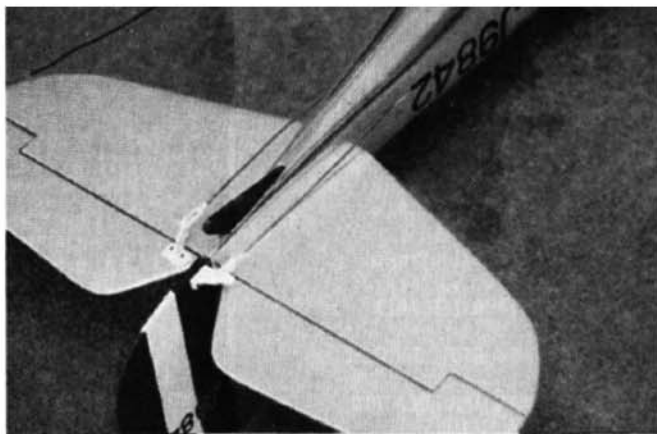
*Completed model prior to covering.*



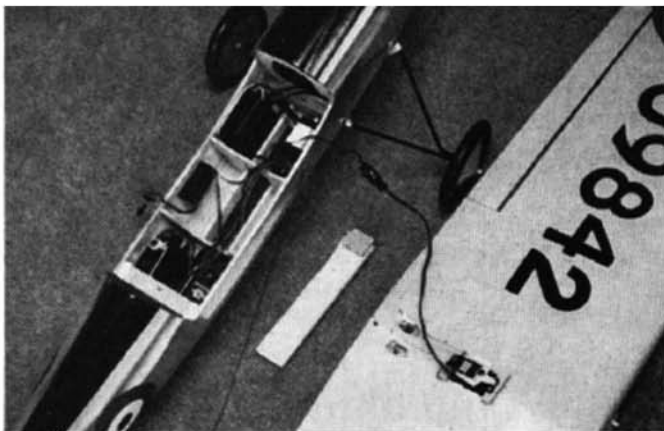
*Power house. MFA RX 15 and Olympus belt reducer.*



*Inserting the drive battery. Note bands for landing gear.*



*Tail linkages.*



*Early airborne installation. Rx now further back.*



*She gets off easily from long grass.*

expensive ARF's with similar sized motors, though with less maneuverability because of the vintage configuration. Power lasts from four to five minutes. Actually, it would be a simple matter to extend the drive battery compartment rearwards, and fit a 7-cell motor for more urge if you were so inclined, especially if you used, say a Futaba BEC type controller and deleted the RX battery.

#### **Flying:**

One of the photos shows the long grass from which the Interceptor 4X made her very first flight, which shows the power available from the RX 15/Olympus combination! She had to take-off properly for her first flight, as the trade name FROG stands for Flies Right Off Ground. Off she soared, sounding like a grown-up rubber job, and looking as much like a 1932

acroplane as any Hawker Hart.

What a sweet looker she is with such harmonious lines, and what a lovely sit she has in the air. When she comes curving round towards you, even the landing gear oozes 1932!

For maneuvers, she loops from the level, though a long gentle dive beforehand makes these more certain. Bi-i-ig barrel rolls, again after a dive are really pretty, but axial



## FROG INTERCEPTOR MK 4X

Designed By:

Gordon E. Whitehead

TYPE AIRCRAFT

Vintage Sport Electric

WINGSPAN

46 1/2 Inches

WING CHORD

8 Inches (Avg.)

TOTAL WING AREA

355 Sq. In.

WING LOCATION

Shoulder Wing

AIRFOIL

Eppler 205

WING PLANFORM

Double Taper

DIHEDRAL, EACH TIP

1 1/4 Inches

OVERALL FUSELAGE LENGTH

35 1/2 Inches

RADIO COMPARTMENT SIZE

(L) 8 1/2" x (W) 2 1/4" x (H) 2 1/4"

STABILIZER SPAN

15 1/2 Inches

STABILIZER CHORD

5 1/2 Inches (Avg.)

STABILIZER AREA

80 Sq. In.

STAB AIRFOIL SECTION

Flat Plate

STABILIZER LOCATION

Mid

VERTICAL FIN HEIGHT

6 1/4 Inches

VERTICAL FIN WIDTH (incl. rud.)

6 1/2 Inches (Avg.)

REC. MOTOR SIZE

05 540 elect. w. reduction drive

BATTERY SIZE

6 or 7 cell 1200 mA

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

REMA

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Ply

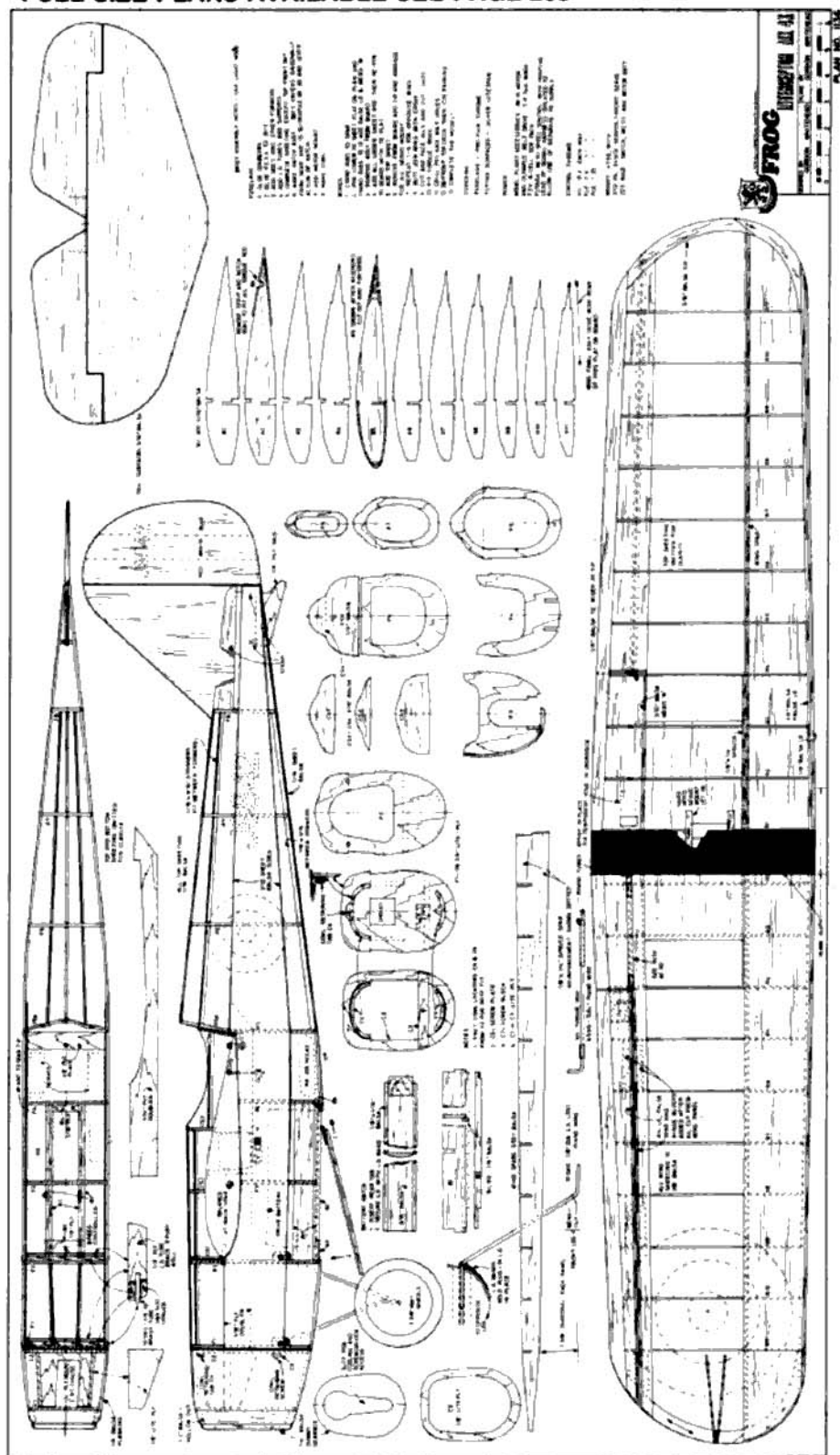
Wing Balsa & Spruce

Empennage Sheet Balsa

Wt. Ready To Fly 47 Ozs. (2 Lbs., 15 Ozs.)

Wing Loading 19 Oz. Sq. Ft.

FULL SIZE PLANS AVAILABLE SEE PAGE 255



ones less so. The stall turns might be termed "Sledgehammer-heads" to bend the term, as that nose really whams down. Spins are fast and furious, so thankfully the stall is predictable and straight.

Take-offs prefer some head wind to increase the slipstream effect over the fin to help to keep her straight on the take-off roll. Over-use of rudder produces an instant ground-loop due to that overly forward l.g. location. The landing is fast and flat, you

should go for wheelers first, before trying (and failing with) your 3-point technique.

### Conclusion:

This little silent flier has provided lots of fun for many fliers, besides myself. She is such a classy little lady that she even won a scale club comp; the other modelers with the genuine articles were very indulgent here, they joined in the fun, and not a cross word was heard. Older modelers walk up to her

and scratch their heads, and then enlightenment dawns: "That's a Frog Interceptor! I used to have one of those!" And then we hear the fond reminiscences, then I'm frog-marched to the flight-line to get her in the air, and we have a ball.

Thanks Frog. And thanks MFA for helping us to re-make a little part of modeling history in such a practical fashion. I hope many of you out there have a go.