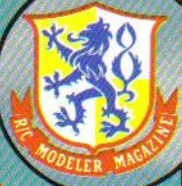


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MARCH 1991

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radio control MODELER

THE WORLD'S LARGEST PUBLICATION FOR THE RADIO CONTROL ENTHUSIAST

POLE STAR

LATEST OF THE
SIMITAR SERIES

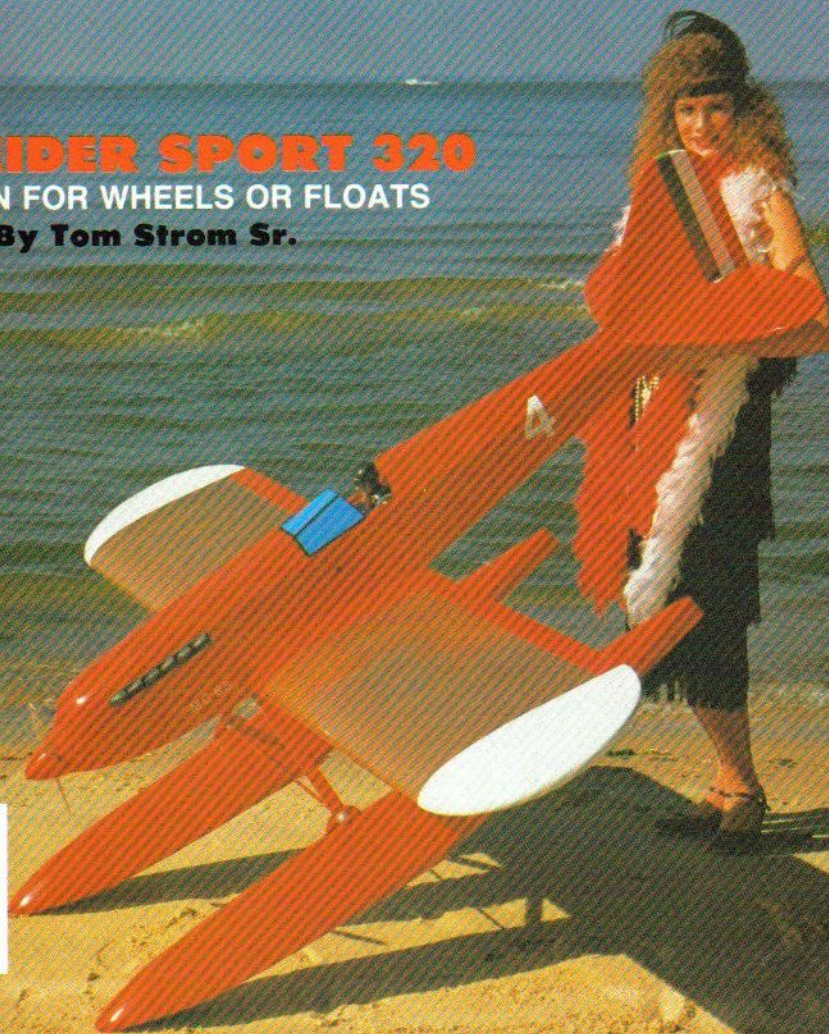
By Bill Evans



SCHNEIDER SPORT 320

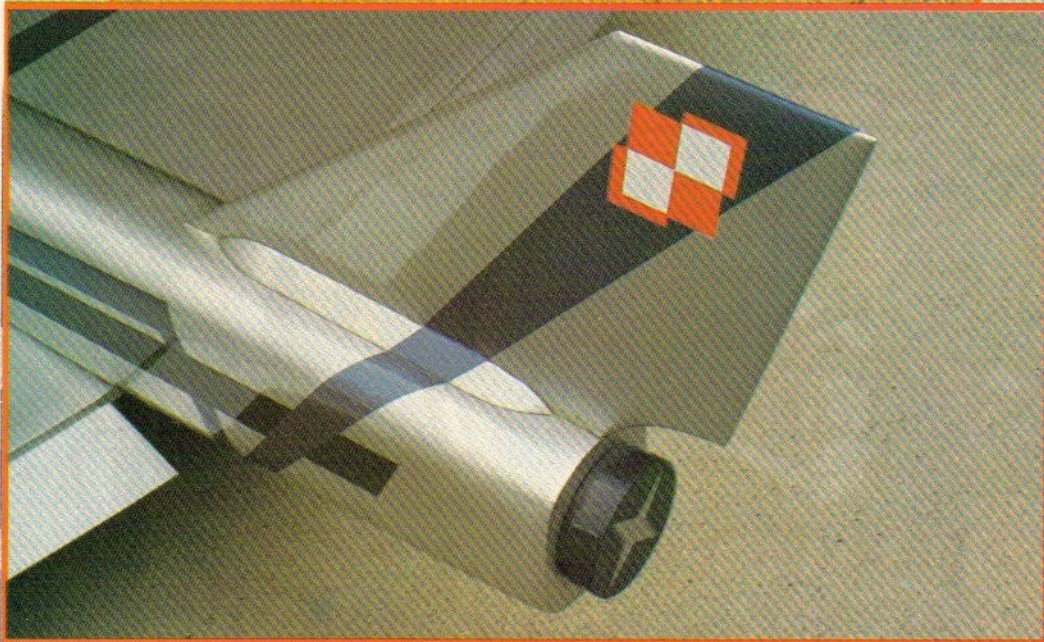
84" SPAN FOR WHEELS OR FLOATS

By Tom Strom Sr.





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Detail of aft section, note 1/2" triangle at base of vertical.

Looking for something different; something that builds really quick and flies great? Well, look no further, this one's got it all!
By Bill Evans

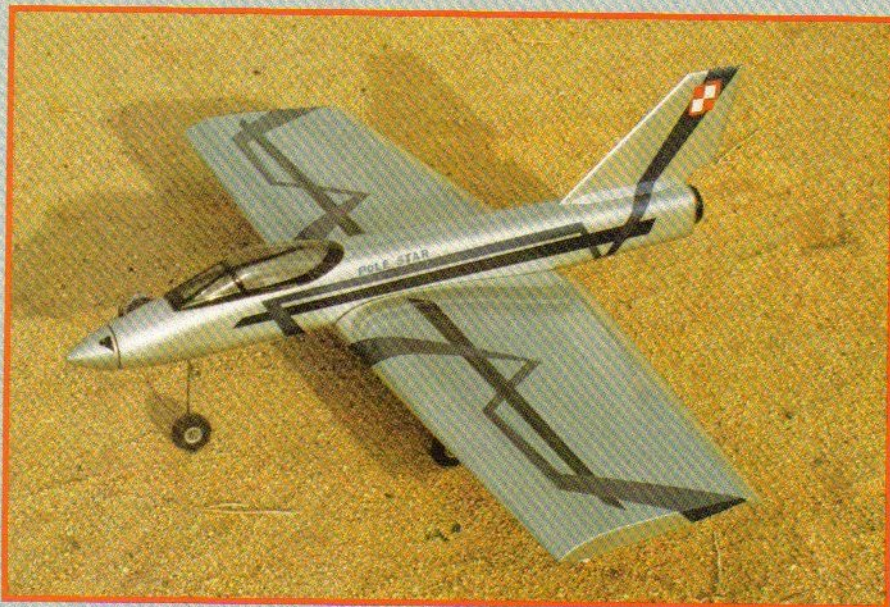
Front end treatment, it's a Sig Cobra canopy.



Welcome to the Simitar Squadron and forward to the Twenty-First Century. Yes, we are the fortunate ones. For countless centuries man has looked to the sky with visions of mastering the art of flight; and we, in our time, merely the blink of an eye in terms of man's time on earth, have witnessed astounding progress. Including flight!

From that moment at Kitty Hawk, when it became a reality that man could fly; aircraft development has raged at a staggering pace. Throughout the years, improved performance to fly faster, higher and farther has been the key thrust of those involved with the progress of flight.

The performance of the Space Shuttle makes it possible to go into space and return. The Concorde's performance as the fastest people mover is incredible; and the



Top shot, silver and blue, bottom of wing is solid blue.

POLE STAR

Designed By:

Bill Evans

TYPE AIRCRAFT

21st Century Simitar Series

WINGSPAN

50 Inches

WING CHORD

15 Inches (Avg.)

TOTAL WING AREA

715 Sq. In.

WING LOCATION

Bottom of Fuselage

AIRFOIL

ESA (Evans Simitar Airfoil, Semi-Symmetrical Reflexed)

WING PLANFORM

Double Tapered

DIHEDRAL

Flat on Top

OVERALL FUSELAGE LENGTH

38 Inches

RADIO COMPARTMENT SIZE

(L) 20" x (W) 2½" x (H) 2½"

STABILIZER SPAN

NA

STABILIZER CHORD (incl. elev.)

NA

STABILIZER AREA

NA

STAB AIRFOIL SECTION

NA

STABILIZER LOCATION

NA

VERTICAL FIN HEIGHT

7¼ Inches

VERTICAL FIN WIDTH (incl. rud.)

7½ Inches (Avg.)

REC. ENGINE RANGE

.40- .60 2-stroke

FUEL TANK SIZE

8-11 Oz.

LANDING GEAR

Tricycle

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Elevons, Throt., Nose Wheel

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Ply

Wing Balsa, Ply & Foam

Empennage Balsa (Fin)

Wt. Ready To Fly 97 Oz. (6Lbs. 1 Oz.)

Wing Loading 19½ Oz./Sq. Ft.

performance of the SR-71 Blackbird makes it possible to travel from coast to coast in 68 minutes and 26 seconds. Ever think about it? None of the above have conventional mounted stabs! Why? Because it takes a flying wing type ship to do the job. Wonder why the Wright's didn't use an aft mounted stab?

Many times it has been said to me, "Why do you fly Simitar Series aircraft? Must be because you designed them." My answer is performance.

Yes, performance. First, no stall...reduce power and gradually feed in up elevator and as it slows down the nose will automatically drop a bit, this reduces the angle of attack, therefore, no stall. Next, the wide speed range...no matter how much power you put to a ship of the Simitar Series, it goes faster (no Dutch Roll). It also slows down to a crawl (effect of no stall) and sets down like a hang glider. Finally a Simitar is directional in flight, in that it will remain in any attitude it is set in, blip a little left aileron and it will hold in a left turn, barring severe winds it will do 360's, one after the other.

Though Simitars operate on the concept of a flying wing, they don't really look like a flying wing, neither do they appear to be conventional in nature. So, what are they? Aircraft of the Simitar Series!

Had enough of the thirty year old state of the rut designs which require constant stick commands and take weeks to assemble countless parts? Need a ship that is new and different? Then maybe you want the new look, easy to build and exciting to fly, advantages of a Simitar!

Join the Simitar Squadron and become a Simitar pilot with a cause and identity. I say identity because of the recognition that all Simitar pilots enjoy; because we are unique and different.

Homer Gibson, of Ripon, Wisconsin, is a true example of being recognized. Homer, is a Simitar pilot, photos of Homer and his Simitars have been seen in the magazines. On his next birthday, Homer will be eighty, he says he doesn't have time to go slow.

Project Pole Star

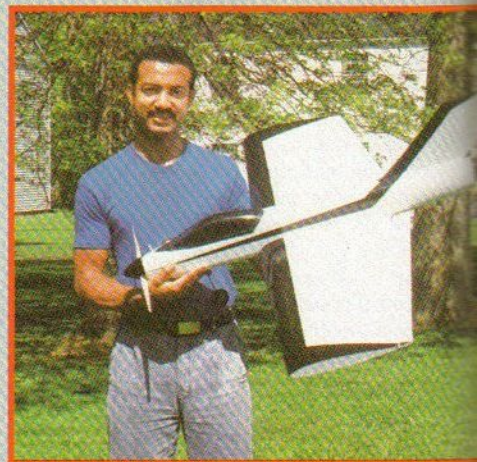
Development of the Pole Star happened in a week. The thought of a new ship,



Teaser photo of Simitars to come. Left is Pole Star 40-60, next is Pole Star X (dubbed EPO, expert pilots only, by the Milwaukee Sqdn.), Pole Star Twin (pair of K&B 45's), and the Navy marked is the Pole Star FBI (Flies By Itself, it's 80" and flies like a free flight).



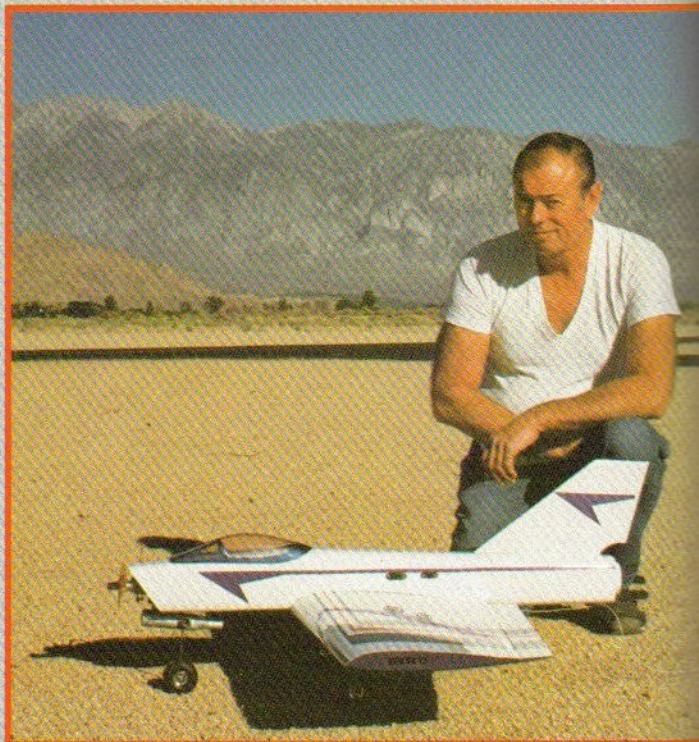
LEFT: Dale Rice, Ceres, California. His Pole Star is glassed and painted by Don Baker, it fairly rips with the Rossi 40. RIGHT: Stan McCray of Ledyard, Connecticut, used an OPS 60 and retracts in his Pole Star. Stan says he loves this baby, it will turn on a dime and leave change, his words are, "Go Simitar."



though ever present, was not foremost in my thoughts. I was concentrating on getting things in order for the 1990 Clearlake event and finishing a new pusher variant of the Simitar. I decided to mark the pusher with Polish Airforce insignias and was looking through one of my aircraft I.D. books for the



Matt Arnett of Lake Isabella, California. Green is great. Power is K&B Sportster.



Hank Bishop, of Bishop, California. His Pole Star has a Webra 60 and uses the Futaba 7UAF.



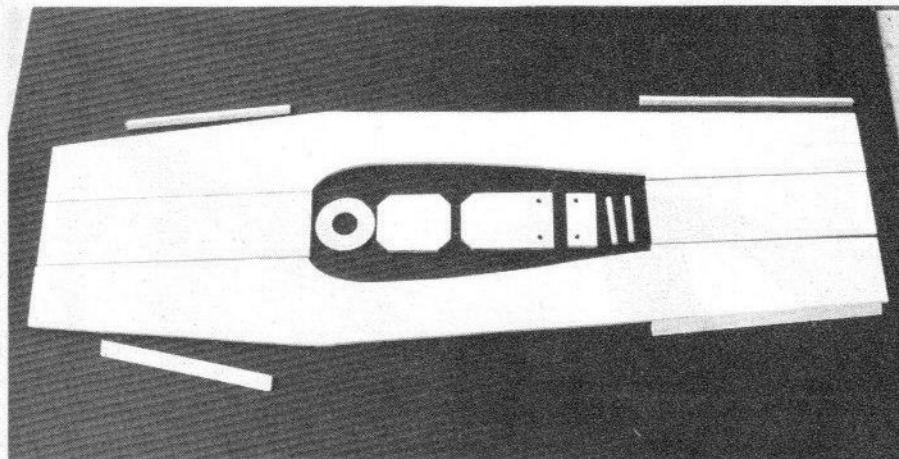
Squadron leader Steve Raskin, representing Australia's Northern Territory Simitar Squadron. Colors are hard to beat and easy to see.



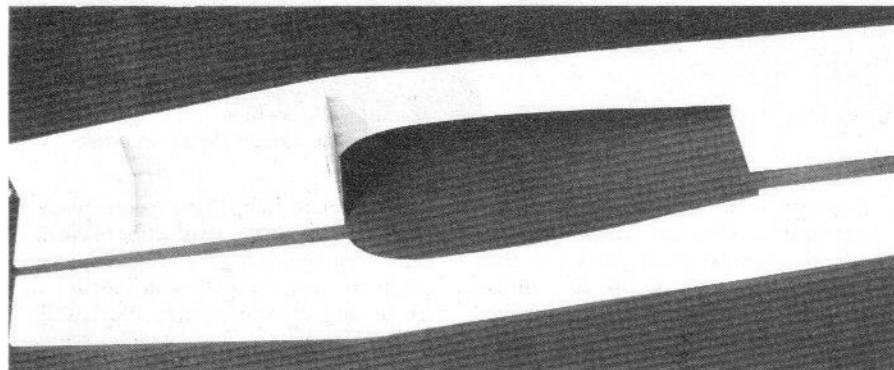
Pete McCoy of Ceres, California. Glassed and painted, power is K&B 65 Sportster.

proper Polish markings. As I thumbed through the book, *Air Warfare*, I noticed some interesting looking jet fuselage, side views, I scanned more pages. An idea began to work on me; how about a Simitar with a jet fighter looking fuselage? Take some F-86, some MIG, some F-104, etc. Move the canopy forward, arc the aft base of the fin, now an outlet at the rear. The wing? Never any doubt, typical Simitar airfoil, sweep the leading edge back an inch. Use the Desparado Sixty wing shortened to a mere fifty inches . . . now you have it.

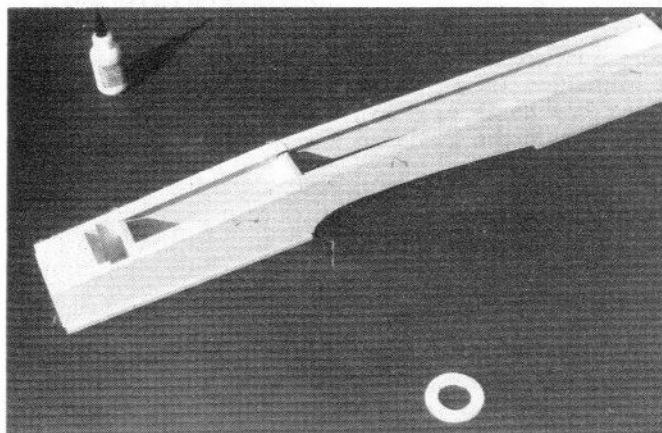
The name came easy, since I had referenced the book in search of Polish markings and in that search a new Simitar, came to be, it was obvious, Polish star, ala Pole Star (which can also be Polaris).



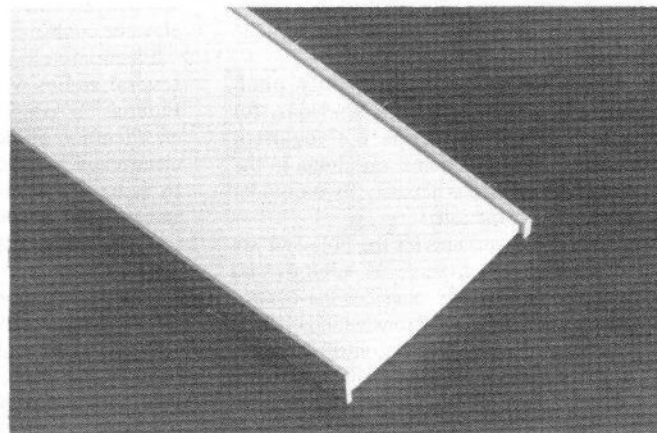
Fuselage pieces laid out, ready to start construction.



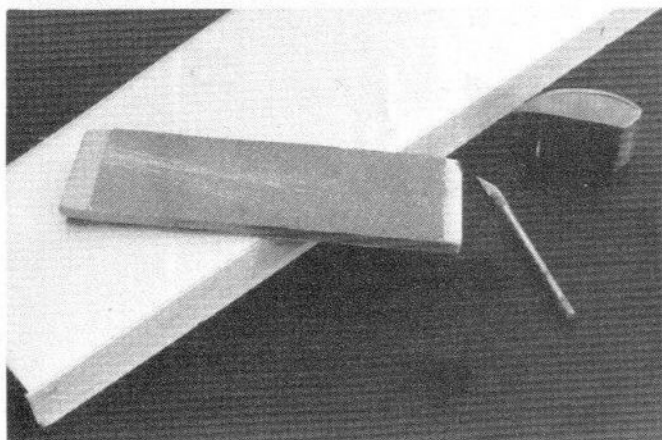
Right side up, 1/2" triangle and formers in place.



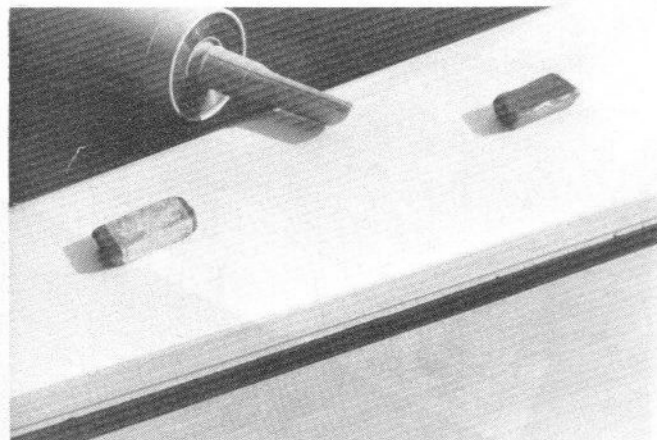
Sides up, nose fill in place, ready for top sheeting.



Glue and pin 1/8" L.E. and 1/4" T.E. to foam cores.



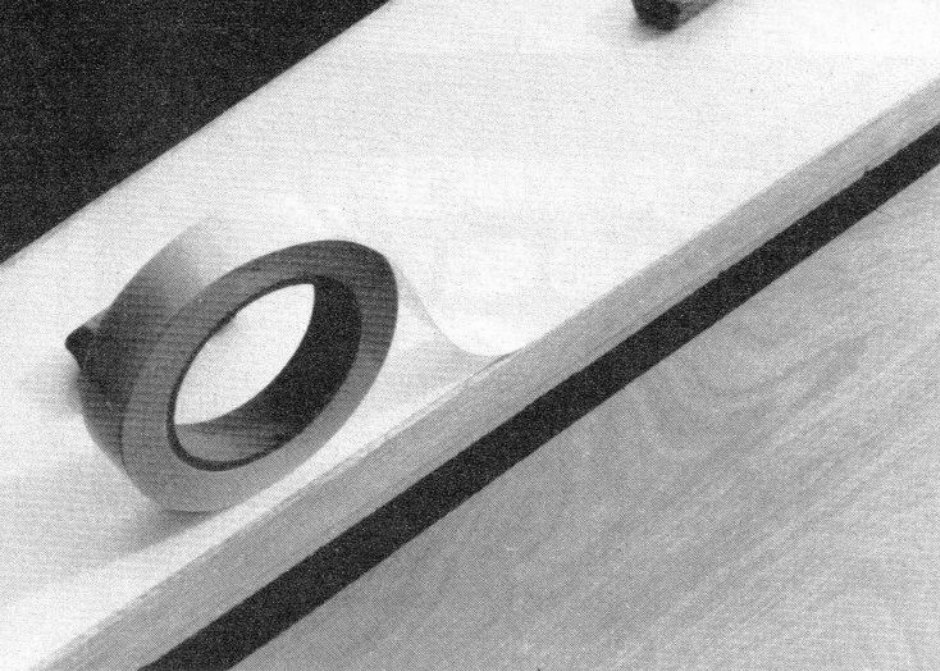
Trim and sand L.E. and T.E. flush with cores prior to sheeting.



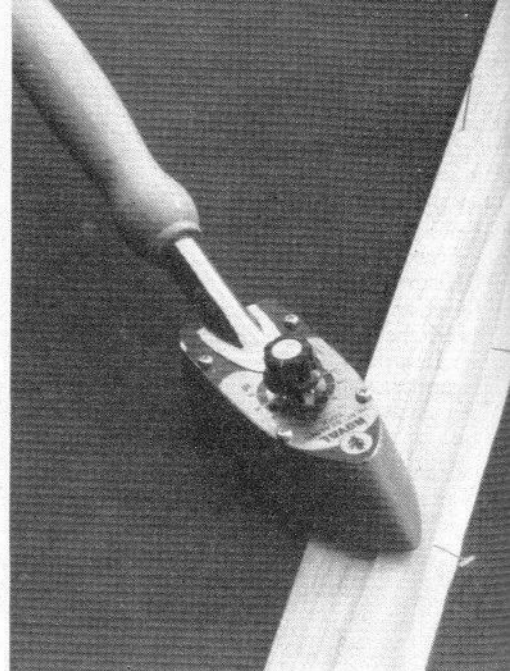
Vacuum cores and sheeting prior to applying Corefilm.

Reaction to the Pole Star has all been positive, all like the jet look of the fuselage, the forward canopy, fin, etc. Wally Mac Alister, of MACS Products, said he needed one, before he saw it finished and covered.

The original was set up with an O.S. 61 rear exhaust, vertical is outrageous, up out of sight, straight down to a pull-out on the deck. In the dive the speed is so fast that the ship out runs the prop and the engine goes rich. Matt Arnett, of Lake Isabella, California, had to have one and put a K&B 65 Sportster in his. Flew great, and at quarter throttle, it just putts along. The wide speed range is due to the no stall advantage



Lay Corefilm down onto core, root to tip.



Pin X-Hinge onto elevon then iron down.

of the Simitar System.

For those who do not cut foam, you may order cores for the Pole Star from Soaring Research, 454 Wildrose Lane, Bishop, California 93514, (619) 873-4932. Cores @ \$18.00, 1/64" ply sheeting @ \$25.00, Shipping is \$7.00.

For those new to the concept of the Simitar Series, an explanation of the control surface function and installation will be helpful.

First, a Simitar requires only pitch (elevator) and roll (aileron) functions, for perfect flight. Rudder is not required; however, there are some variations in the Simitar Series that will easily fly on rudder and elevator functions.

The control surfaces for the Pole Star are the elevons which serve as ailerons and elevators. In essence, consider the control surfaces as full strip ailerons which counter actuate to provide aileron control and also actuate simultaneously to provide elevator control. This means some form of mixing is required.

Mixing can be accomplished by mechanical or electrical means. The best mechanical method is to use my sliding tray, which works as follows: One servo in the tray is the aileron servo, set it up as you would for strip ailerons. The second servo is for the elevator and it's control arm is attached to a stationary bulkhead by the tray and will slide the tray fore and aft to provide elevator control.

Electronic elevon mixing is included in several radios via the transmitter. The Futaba 7UAP, 7UAF and 9VA do an excellent job of electronic mixing. Mixing electronically at the receiver is also possible by using Ace's Christy Mixer, which plugs in-between the receiver and the servos. The Christy is about \$30.00 and works very well.

Electronic mixing makes it possible to mount the two servos in the bottom of the wing, on the outside (as shown in text photo). This method provides a more rigid actuator rod set-up.

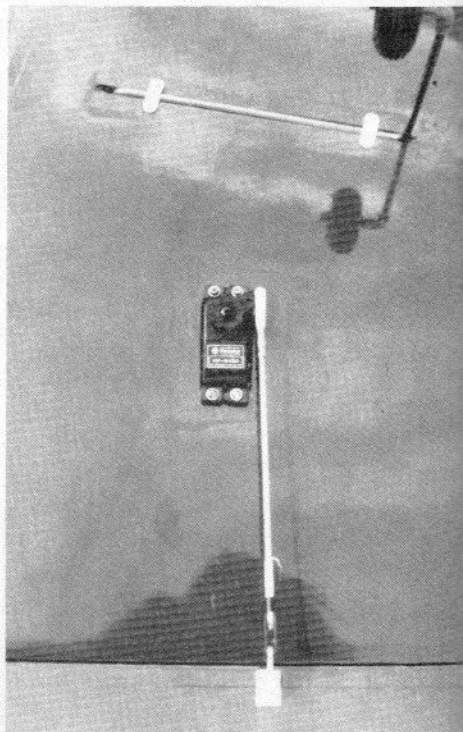
Once you have decided on the type of

mixing you're going to use, you're ready to start building. Since construction of the Pole Star is simple, and goes so quickly, we'll keep the construction notes brief. By referring to the plans, photos and construction notes, you shouldn't run into any major problems, so let's get started.

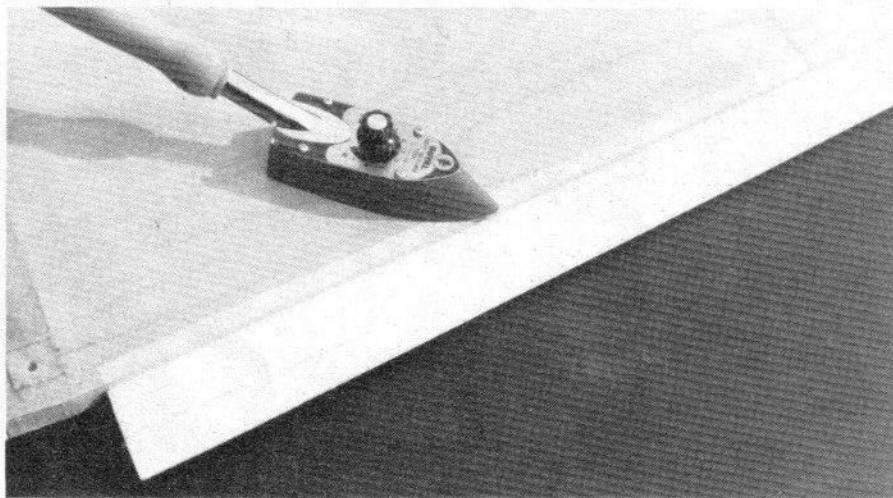
CONSTRUCTION

Glue and pin the 1/8" leading edge and 1/4" trailing edge stock to the foam cores, carpenters glue or UFO does well, set aside to dry.

Mark location of firewall and former on



Detail of mounting elevon servo and pushrod on bottom side of wing. This set-up is possible when using electronic mixing, such as with Futaba 7UAF.



Pin elevons into place on wing and iron down X-Hinge.

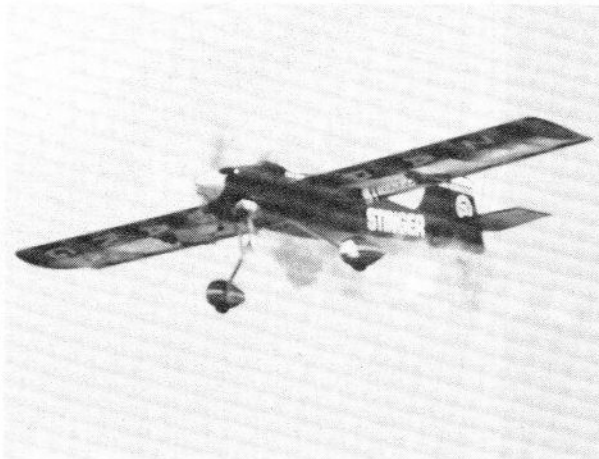
EXPERIENCE AN AWESOME FLYING MACHINE!

THE STINGER

Specifications:

Fuselage length: 52½"
Rec. Engine Size: 1.2-4.2 cubic in.
Flying Weight: 14 lbs. and up
Wing Span: 84"
Area: 1596 sq. in.
Radio Channels: 4

Cat. No. 90208



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Stinger Features:

- Vacuum Formed Fuselage Turtledeck, Wing and Fuel Tank Cover
- Foam Wing with Balsa Spars, Partial Balsa Sheeting and Cap Stripping Required
- Parts for Complete Built-up Fuselage with Plywood Sides
- Hefty Performed Aluminum Landing Gear
- ABS Cowl and Wheel Pants
- Parts for Complete Built-up Tail Assembly
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- Especially Designed for the First Time Giant Scale Pilot
- Spare Parts are Available
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- Easy to Follow Plans & Inst.
- Fast Assembly with Minimum Parts
- Symmetrical Airfoil
- Can be Flown at IMAA Events

fuse sides and bottom front.

Pin fuselage bottom pieces down on work surface, set these pieces in line and separate them by the width of the airfoil cutout as on the fuselage sides.

Pin right fuselage side onto rear fuselage bottom and front fuselage bottom. The fuselage side is flush with the outside edge of the bottom pieces. Pin in place front bottom 1/2" triangle and rear triangle, also firewall and former. Now apply Hot Stuff.

Pin left fuselage side and bottom triangle in place and Hot Stuff.

Pin 1/4" rear cap, 1/2" top triangles into place, also 1/4" sheet to fill nose to spinner ring. Cement all into place.

Sand top flush and cement front and rear top 1/4" sheet into place.

Sand front square and cement 1/8" spinner ring to front of fuselage.

Fuselage is ready to carve and sand for fit and finish.

Carve, plane and sand the 1/8" leading edge and 1/4" trailing edge spars so the sheeting will fit flat over the cores.

Apply wing sheeting. We used 1/64" ply and Corefilm.

Cement 3/8" leading edge cap onto wing.

Mark location of landing gear blocks on wing skin. Cut away skin and foam to allow flush mounting of blocks in wing. Install landing gear blocks using epoxy cement.

Sand leading edge of wing to shape, note how bottom is fairly flat and top is steep.

Join wings with 5-minute epoxy and add 1/4" tip plates.

Fit wing to fuse, use 1/4" ply plate to attach wing via 1/4" dowels.

Use 5-minute epoxy to float ply plate into place on wing.

Sliding Tray Mixer

Control Set-up

The sliding tray fore and aft formers are of 1/4" ply, drill the 1/8" holes for the dowel through both of the formers at the same time, this will make the holes parallel. Cut the 1/8" ply tray to fit both the aileron and elevator servos. Push the dowels into one of the formers, then slide the red outer NyRod over each dowel then push the other former onto the dowels. Cement the tray in place onto the NyRods. Be careful not to get cement inside the NyRod; then install servos as shown.

Electronic Mixer

Control Set-up

Use 1/8" ply trays to mount servos into wing, epoxy the trays flush on the bottom of the wing after sheeting. Grind a hole on the top side of the wing in the center and use a piece of piano wire with a hook bent into the end to tunnel out for the servo lead. The lead is then easily fished through with a piece of string.

Cut and fit fuse to accept engine and install nylon wing hold down bolts.

Cut and shape fin. Final sand all parts and prepare for covering.

Set elevator function so the elevons are 1/8" above what is normally considered neutral (level), this is to provide the necessary reflex.

Control throws? I put in as much as I can get, then use what I need. 3/8" to 1/2" of up, down, left and right is fine. Remember control is not like a light switch (on or off), it's like a dimmer switch, use only as much pressure on the stick to make it do what you want!

Set the nose wheel height, so that while setting on a flat surface, the leading edge of the wing is 1/4" + higher than the trailing edge (measured at the hinge line).

Check all surfaces for proper movement (remember left aileron command results in the left aileron going up and the right going down).

Ah, yes, flight performance of the Pole Star. Typical Simitar, no stall, wide speed range, and goes exactly where it's pointed. Very smooth flying and graceful; gives the feeling that it's an extension of yourself in the air. Seems to always do the right thing, often before you think of it.

Are the thumbs quicker than the eye?
Have Fun!

Reference Material

For more information about the development of the Simitar Series, refer to the following listing in Radio Control Modeler,
January '90, Leading Edge (Twin fin 40 powered jet look);
March '88, Desperado Sixty (60" anhedral rocket), Desperado 3000 (85" 17 lb. S.T. 3000 powered);
August '86, Tracer 40 & 60 (pattern ships);
March '85, Skywalker 1/2A, 40 & 60;
November '79, Astron 40 (X-Wing fighter);
October '79, Simitar 540 (50" 40 power);
December '76, Simitar (1/2A, the first Simitar);
April '76, Saracen (72" glider, Bill's first flying wing).