WISEGUY

Simitar Series
By Bill Evans

Whether You're A Novice Or An Expert, Here's A 21st Century Simitar For You.

Tom Titolo, Atascadero, CA, with his Wiseguy which is glassed and painted.

The real reason we take up a pastime hobby is to have fun and get relief from daily problems related to complexity, pressure, and stress. It is fun to get out and do what you want to do, the way you want to do it, and when you want to do it. To continue the above thought, when we get into the R/C hobby, we want an airplane that is easy to fly (not something you have to fight to keep in the air). We also want something that is easy to build.

The Wiseguy fits the above bill. It is so easy to fly that it rates high in the Simitar class of FBI (Flies By Itself) aircraft. The ship is so aerodynamically stable that I can give the transmitter to my five year old granddaughter, Lindsay, and I go for a cup of coffee while it continues gentle 360° turns at a constant altitude. I can put the transmitter in the hands of anyone of any age and they fly, loop, and roll on their first flight.

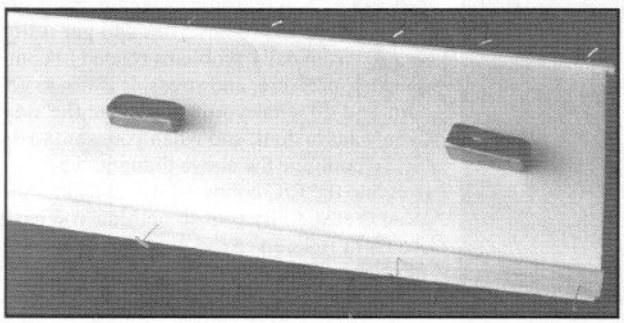
Using CA adhesive, Wiseguy fuselage construction takes about an hour, ready for sanding. The wing is foam, and construction takes about two hours. Add another couple of hours for other parts and sanding, then you are ready to cover. Covering takes me

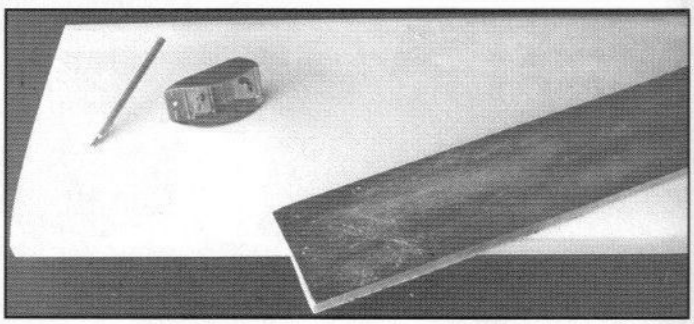
Bill on a roll, nose up, wheels down, airborne.

about six hours; I just can't do it faster. Then another six hours to install engine, radio, and other components, and you are ready to fly.

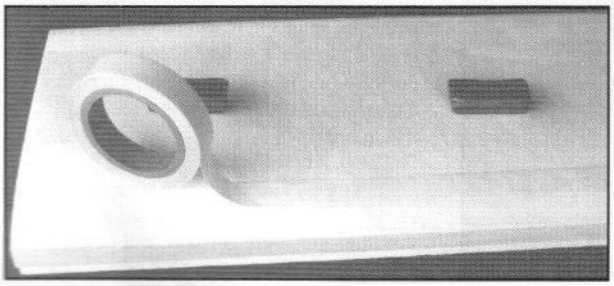
Wiseguy is the 86th design in the Simitar Series. The first Simitar-type aircraft appeared over twenty years ago when I designed the Saracen glider (*RCM* construction article April '76, Plan #639). The Saracen was the test bed for all Simitars to follow. Flown off slopes and hi-start, sizes ranged from 48" to 120" spans. Interest began to grow. The Saracen was a flying wing using elevons (combined elevator and ailerons using the same control surfaces). We were all amazed at how aerodynamically stable it was, and how it just would not stall. As you gradually pull back on the stick and slow the Saracen down, it would not drop the tail and roll off in a tip stall. It would merely drop the nose and keep flying! So, if it flew that good as a glider, how about a powered version?

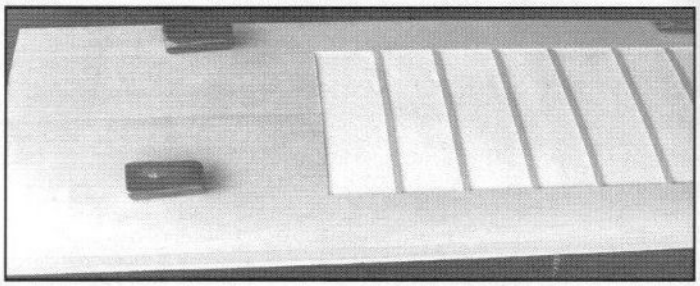
At this point, I should explain where the term Simitar came from. When I was working on the construction article for the first powered version for *RCM*, Dick Kidd said, "What are you going to name this one?"





LEFT: Glue and pin 3/16" balsa leading edge undercap and 1/4" balsa trailing edge to cores. Use CA UFO or carpenter's glue. RIGHT: Trim, plane, and sand the balsa leading edge undercap and trailing edge to match the airfoil contour.





LEFT: Apply two strips of Corefilm to leading and trailing edges of cores. Remove paper backing and place 1/16" x 2" balsa sheeting in place on foam and smooth down. RIGHT: Add inboard sheeting and glue the 1/16" x 1/4" capstrips in place (on 2" centers).

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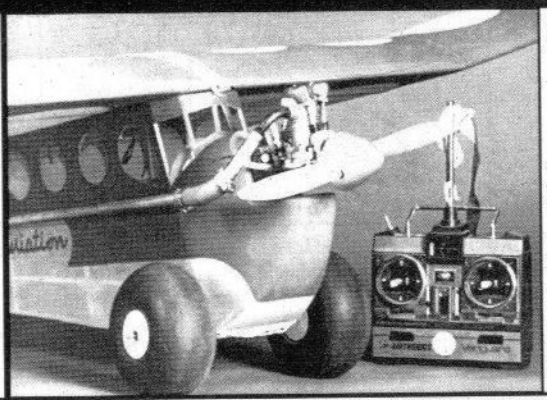
By the way, if you have a hard time reading our tiny print, you **really** should get a Lazy Bee – it's so easy to see!



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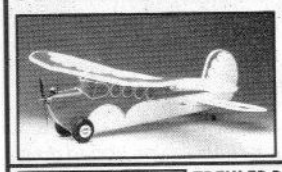

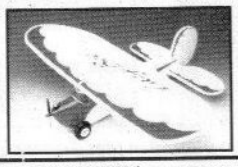

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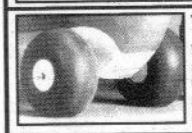

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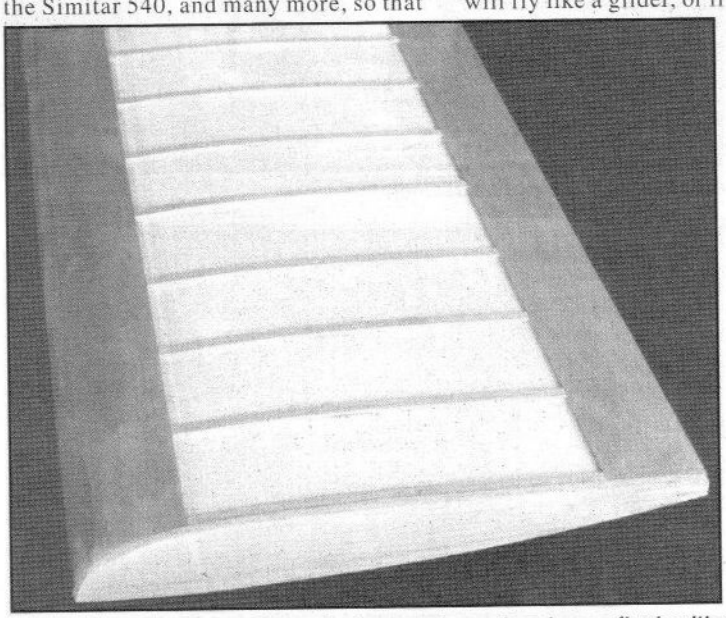
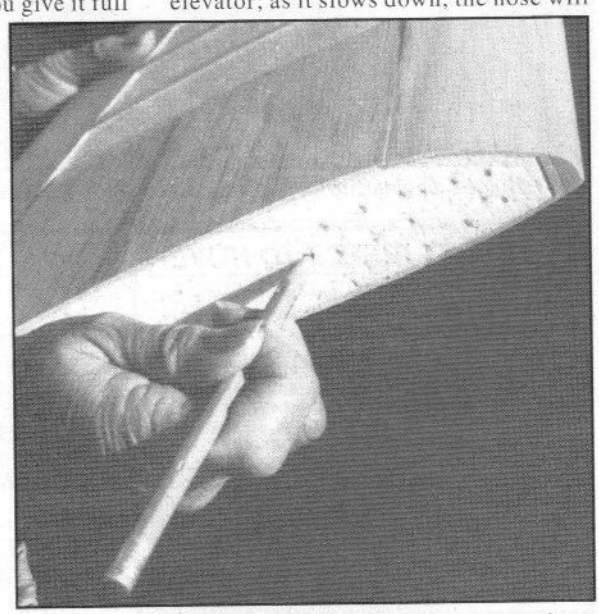
I had to do some thinking. It took a while but the resulting thought process was: Since the original of my flying wings was the Saracen (airy sounding like "air-a-cen"); and, the Saracens fought the Crusaders in the holy wars using curved swords, it followed that the power of the Saracens was in these curved swords called Similtars. Therefore, the first powered Saracen was named the Similtar. Next in line came the Similtar .15, the Similtar 540, and many more, so that today, the Similtar is a distinct class of aircraft. Even though development of the powered versions resulted in longer fuselages that take away the look of a flying wing, aerodynamic performance and stability have been retained. Some call the Wiseguy the F.B.I., that is, Flies By Itself; and others call it the K-12, meaning suitable for kindergarten through high school, because if you slow it down and give easy gentle control, it will fly like a glider, or if you give it full power and push controls to the max, it will respond with full aerobatics as fast as you can input the control movement.

Wiseguy's performance is due to its inclusion in the Similtar Series. Many times it has been said to me, "Why do you fly Similtar Series aircraft? Must be because you designed them." My answer is, "Performance."

Yes, performance. First, no stall ... reduce power gradually while you slowly feed in up elevator; as it slows down, the nose will





LEFT: After sheeting bottom of wing panel, sand undercap flush with sheeting. Cement and trim the 1/4" leading edge cap to shape shown on plans. Note the steep top on leading edge and fairly flat bottom. RIGHT: Center section of wing. Punch holes in root prior to joining wing halves with 5-minute epoxy. Note 1/4" balsa leading edge cap.

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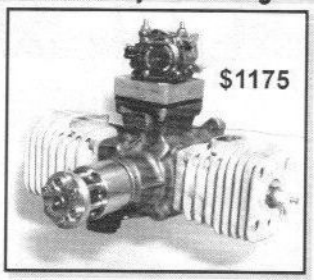
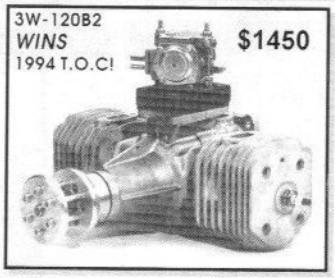


3W-70B2
4.2 in³
6.5 HP
4.9 lbs.
24 x 10



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7.0 in³
12.0 HP
8.8 lbs.
28 x 12

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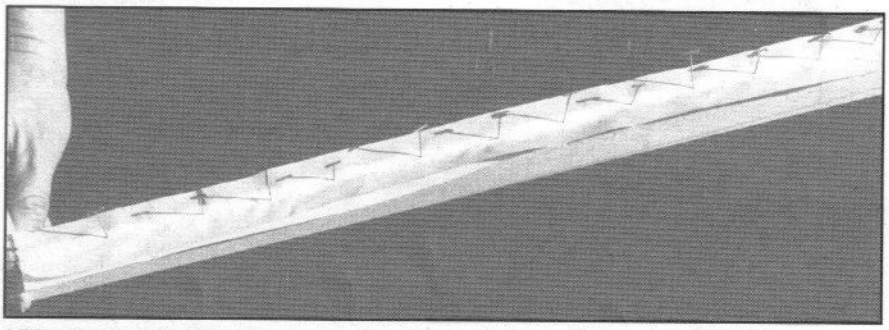
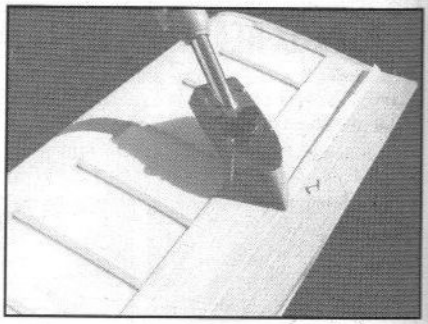


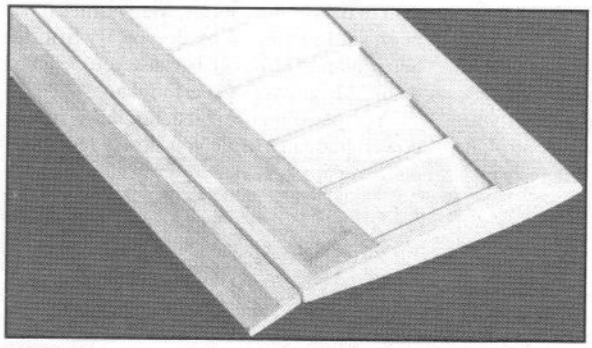


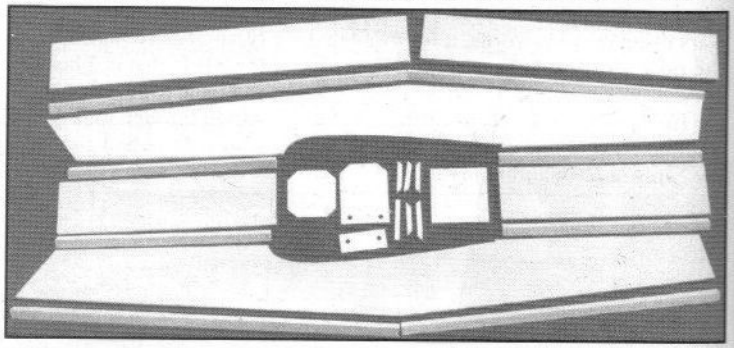
LEFT: Pin hinge to edge of control surface, be sure to keep stitch centered. RIGHT: Elevon pinned in place on wing, X-Hinge being ironed down.

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 just 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 as it will remain in any attitude it is set in. Blip a little left aileron, let go, and it will hold in a left turn (no trim set); barring severe winds, it will hold 360's, one after the other.

Now, add flying in winds up to 60 mph, hovering inverted, and backing up mid-air in the same wing. Add vertical landings and vertical take-offs (recorded on VHS). To explain what the Wiseguy can do in its entirety would take too long; to say what it cannot do is most simply put by saying, "The Wiseguy violates all limits of what some hold true."

Also, for the record, the fastest aircraft in the world, the SR-71 Blackbird, is a flying wing; it has no conventional aft mounted horizontal stabilizer. Neither does the fastest people mover, the Concord; nor does the world distance





LEFT: Hinge complete, no air gap, free action. RIGHT: Fuselage parts cut and ready for assembly.

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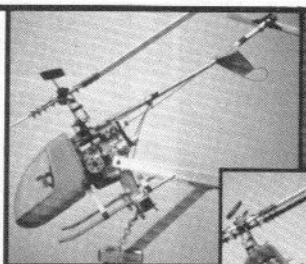

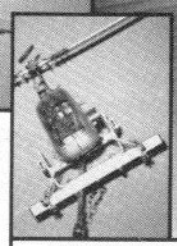

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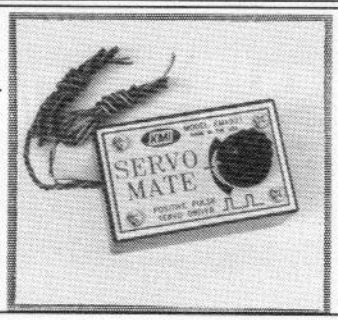

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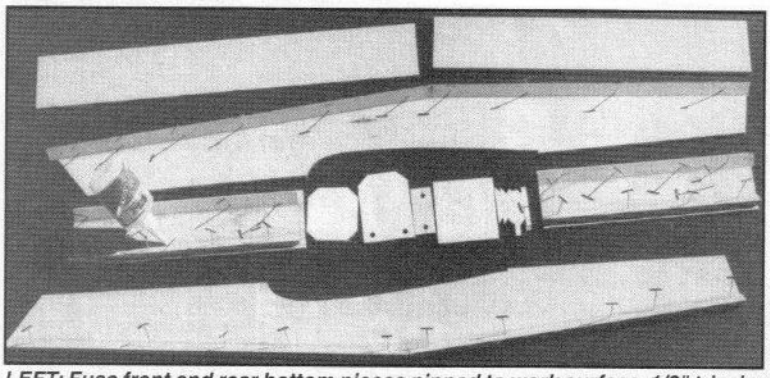
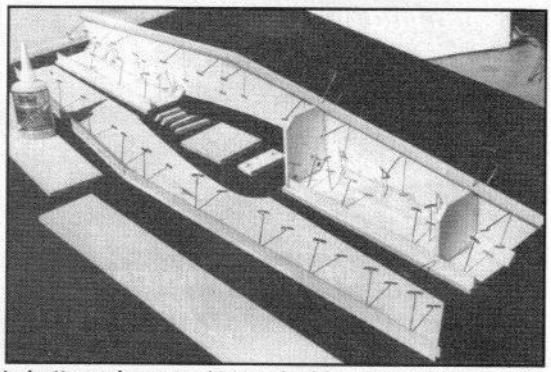




LEFT: Fuse front and rear bottom pieces pinned to work surface, 1/2" tri. pinned to bottom pieces and to top inside edges of sides, note CA thin is run on inside edge only as shown. RIGHT: First side pinned in place with former and fire wall.

record holder (goes into space and returns), the Shuttle. Ever wonder why? Could it possibly be **performance**?

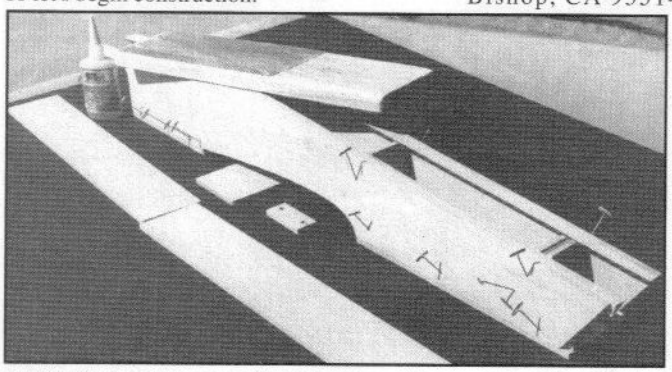
Yes, I know, you need to have a Wiseguy, so let's begin construction.

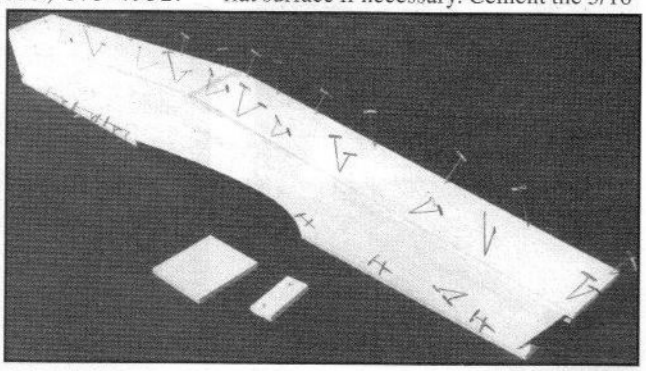
CONSTRUCTION

For those who do not cut foam, you may order cores for the Wiseguy from: Soaring Research, 454 Wildrose Lane, Bishop, CA 93514, (619) 873-4932. Cores are $20.00 and shipping is $7.00.

Wing:

Make sure the wing panels are flat and straight; use weights with the core on a flat surface if necessary. Cement the 3/16"





LEFT: Pin and CA second side in place, then sand top flush before applying top pieces. RIGHT: Top pieces in place, fuse construction is basically complete.

WISEGUY

Designed by:
Bill Evans
TYPE AIRCRAFT
21st Century Simitar Series
WINGSPAN
64 Inches
WING CHORD
14 Inches
TOTAL WING AREA
890 Sq. In.
WING LOCATION
Bottom Of Fuselage
AIRFOIL
ESA (Evans Simitar Airfoil)
Semi-Symmetrical Reflexed

WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1/2 Inch
OVERALL FUSELAGE LENGTH
42 Inches
RADIO COMPARTMENT SIZE
(L) 10" (W) 2-1/2" (H) 2-1/2"
VERTICAL FIN HEIGHT
10 Inches
VERTICAL FIN WIDTH (inc. rud.)
9 Inches (Avg.)
REC. ENGINE SIZE
.25-.60 2-Stroke
FUEL TANK SIZE
4-8 Ounces
LANDING GEAR
Tricycle
REC. NO. OF CHANNELS
4

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C.G. (from L.E.)
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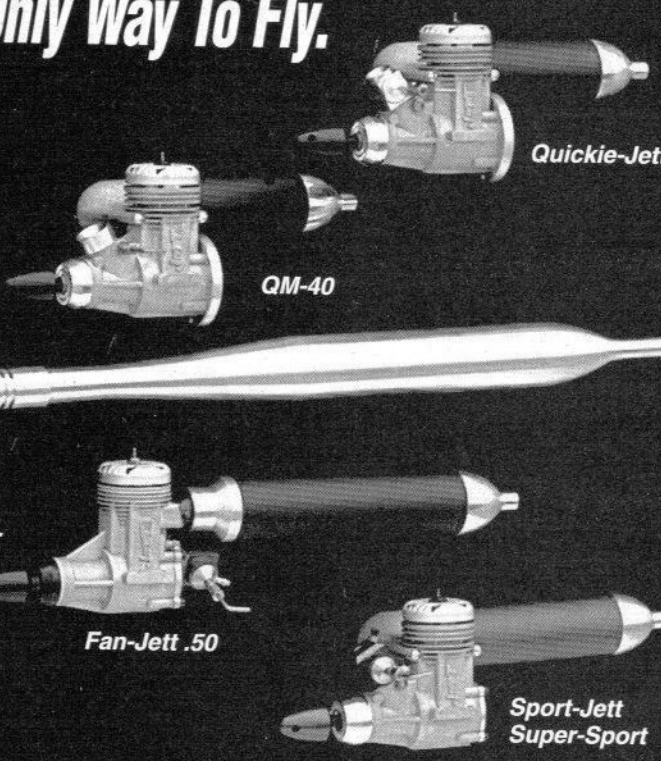

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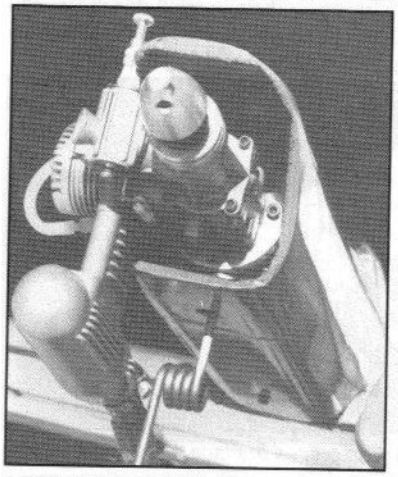

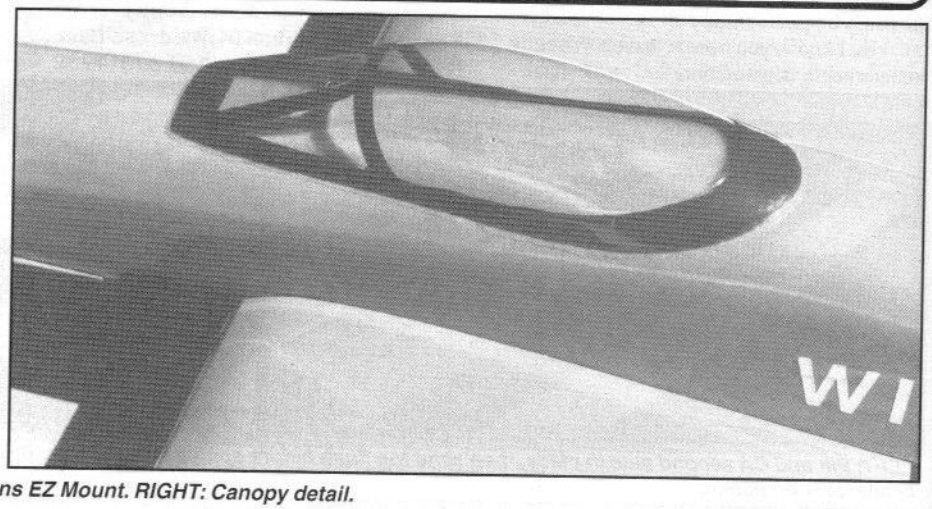

LEFT: Detail of K&B .40 mounted with Evans EZ Mount. RIGHT: Canopy detail.

balsa leading edge undercap to the leading edges, and the 1/4" balsa trailing edge to the trailing edges. Use CA UFO or carpenter's glue; do not use regular CA on foam; set these aside to dry.

Fuselage:

Cut out the balsa fuselage pieces, plywood fire wall, bulkhead, and wing plate. Match drill the bulkhead and wing plate with 1/4" diameter holes for the retaining dowels. Place fuselage front and rear bottom pieces on a flat work surface, and separate them by the width of the wing cut-out. Use the fuselage sides to line them up, then pin the front and rear bottom pieces to the work surface.

Mark the location of the fire wall and bulkhead on the fuselage sides and front bottom. Pin the 1/2" triangle longerons onto the fuselage front bottom and rear bottom, 1/4" from the outer edge (to allow the fuselage sides to fit flush on the outside). Now apply thin CA to the longeron inside edges only (the CA will run under the triangle stock and bond to the fuselage bottom).

Pin the top pieces of the 1/2" triangle longerons to the top inside edge of the fuselage sides (flush with the top edge of the sides) and apply CA to the longeron/fuselage inside edge.

Remove the pins from the 1/2" longerons (the CA should be set). Pin one of the fuselage sides in place onto the bottom pieces against the 1/2" triangle longerons. Run CA between the fuselage side and the 1/2" triangle. Now set the fire wall into place and apply CA; do the same for the plywood bulkhead. Pin the second fuselage side into place and apply CA to longerons, fire wall, and bulkhead. Pin and CA 1/4" x 1/4" strips around rear outer edge of fire wall.

After the CA is set, carefully remove all pins, sand the top edges of the fuselage sides so the top front and rear pieces will fit flat, then pin and CA them into place. When the CA is set up, trim and sand the rear end flat; pin and CA the fuselage rear end closure in place. Fuselage construction is now complete! Round the fuselage corners and apply sandpaper.

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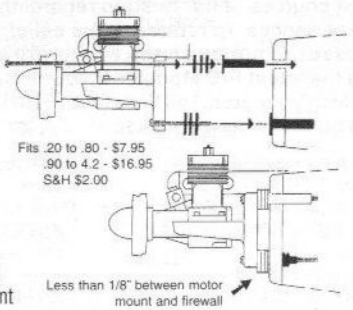

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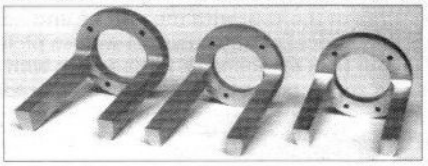

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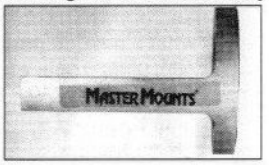

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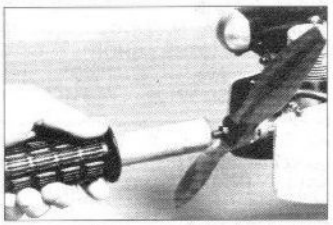

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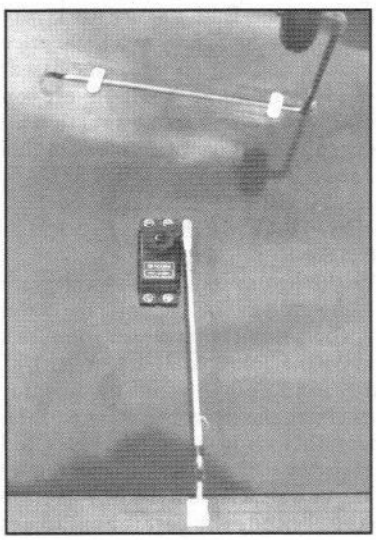

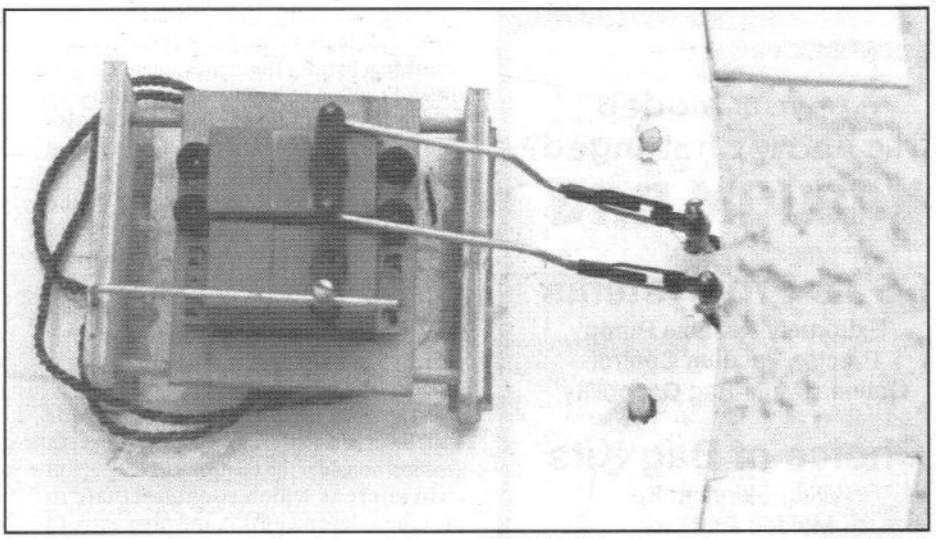

LEFT: Position of elevon servo on bottom of wing used with electronic mixing of elevons. RIGHT: Sliding tray set-up.

Back To The Wing:

Carve, plane, and sand the 3/16" leading edge undercaps and 1/4" trailing edge spars so sheeting will fit over the cores and these spars. Do not sand any of the core away.

Sheet the wings. We used Corefilm to apply the 1/16" x 2" leading and trailing edge, and 1/16" thick center section sheeting. Capstrips are 1/16" x 1/4" on 2" centers, glued in place.

Sand the leading edge and trailing edge sheeting flush with spars. Pin and CA 3/8" x 1" leading edge cap to leading edge. Pin and CA 1/4" tip plates to outboard ends of wing halves. Shape and sand leading edge and wing and tip plates. (Note: Leading edge bottom is nearly flat and leading edge top curve is fairly steep.) Do not round the bottom leading edge; a max radius of 1/16" is desirable. Join wing halves with 5-minute epoxy.

Fit elevons to wing. We used X-Hinge to attach elevons to wing. (Note: If you use mechanical elevon mixing, form and install elevon control rods before you attach elevons.) Cut and cement end grain balsa into wing at bolt location to obviate crush of wing when bolting to the fuselage. Fit the 1/4" plywood wing plate into the leading edge of wing at center section. Set wing and wing plate into place on fuselage and check for fit before gluing wing plate to wing. Now, using waxed or greased temporary 1/4" dowels, set wing and plate into place, align them, and glue plate to wing with 5-minute epoxy.

Place hardwood gear blocks at correct location on bottom of wing, mark area and remove sheeting and foam so that blocks are flush with sheeted bottom surface of wing. Glue these in place using 5-minute epoxy. Now, sand and cover wing. (Note: If you use electronic elevon mixing, install 1/8" ply servo plates, flush with bottom surface of the wing, and dig out foam for servo pocket prior to covering wing bottom.)

HOBBY SHOP BULLETIN

RCM has long maintained that the local hobby shop is one of your best sources of information regarding the R/C hobby. It also provides the opportunity and forum for the exchange of ideas and experiences. To reinforce this belief, RCM will be featuring each month different sections of the U.S. with the names and addresses of hobby shops where you can see and purchase "what's new" in modeling, share local hobby news, as well as pick-up the latest R/C Modeler. If your local shop does not carry RCM, please call, we will do our best to locate the hobby shop with RCM in your area. Toll Free (800) 523-1736. RCM would like to express its appreciation to Kalmbach, distributor of hobby related books to shops, for their assistance.

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Complete, sand, and cover vertical fin. Cover fuselage, then epoxy vertical fin to fuselage. (Pattern fliers may change fin to fin and rudder.) Shape, cover, and epoxy 1/2" triangle fin fillets in place. (Note: Be sure to remove covering from fuselage and vertical fin in the areas of glue joints.)

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

First, a Simitar requires only pitch (elevator) and roll (aileron) functions for perfect flight. Except for pattern flying, a rudder is not required.

Simitar control surfaces are elevons which serve as ailerons and elevators. In essence, consider the control surfaces as full strip ailerons which counteractuate to provide aileron control and also actuate simultaneously to provide elevator control. This means some form of mixing is needed. Such mixing can be provided by mechanical or electronic means.

The best mechanical method is to use my sliding tray, which works as follows: One of the servos in the tray is set up as you would for strip ailerons. The second servo is for elevator, and its control arm is attached to the stationary bulkhead at the front of the tray so that it will slide the tray fore and aft to give the elevator function.

Electronic mixing can be provided by either a radio with built-in mixing or by using Ace's Christy Mixer, or the Quillan Mixer which plug in-between the servos and the receiver. Both mixers work very well and are in the $25.00 to $45.00 price range. Alternatively, some of the newer radio systems have built-in elevon mixing, or flaperon mixing functions. I have used several of the Futabas in this line, such as the 6VA, 7NFK, 7UAF, 7UAFS, 7UAP, and 9VP.

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 formers at the same time, this will make the holes parallel. Cut the 1/8" ply tray to fit both 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 NyRods), then install the servos as shown.

ELECTRONIC MIXER

Control Set-Up:

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

Final Assembly:

Install the landing gear, engine, fuel tank, and all the radio components. Hook up all the controls and check to make sure there is no binding. Check to make sure your air-

craft balances (level to slightly nose down) at the location indicated on the plans (approximately 1-1/2" behind the leading edge of the wing, with no fuel in the tank).

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 as you need 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). Also, the trailing edge of the elevons are set 1/8" up with the transmitter trim at neutral.

Check all surfaces for proper motion. (Remember, left aileron command results in the left elevon going up and the right going down; and the up elevator command results in both elevons going **up**.)

Flying:

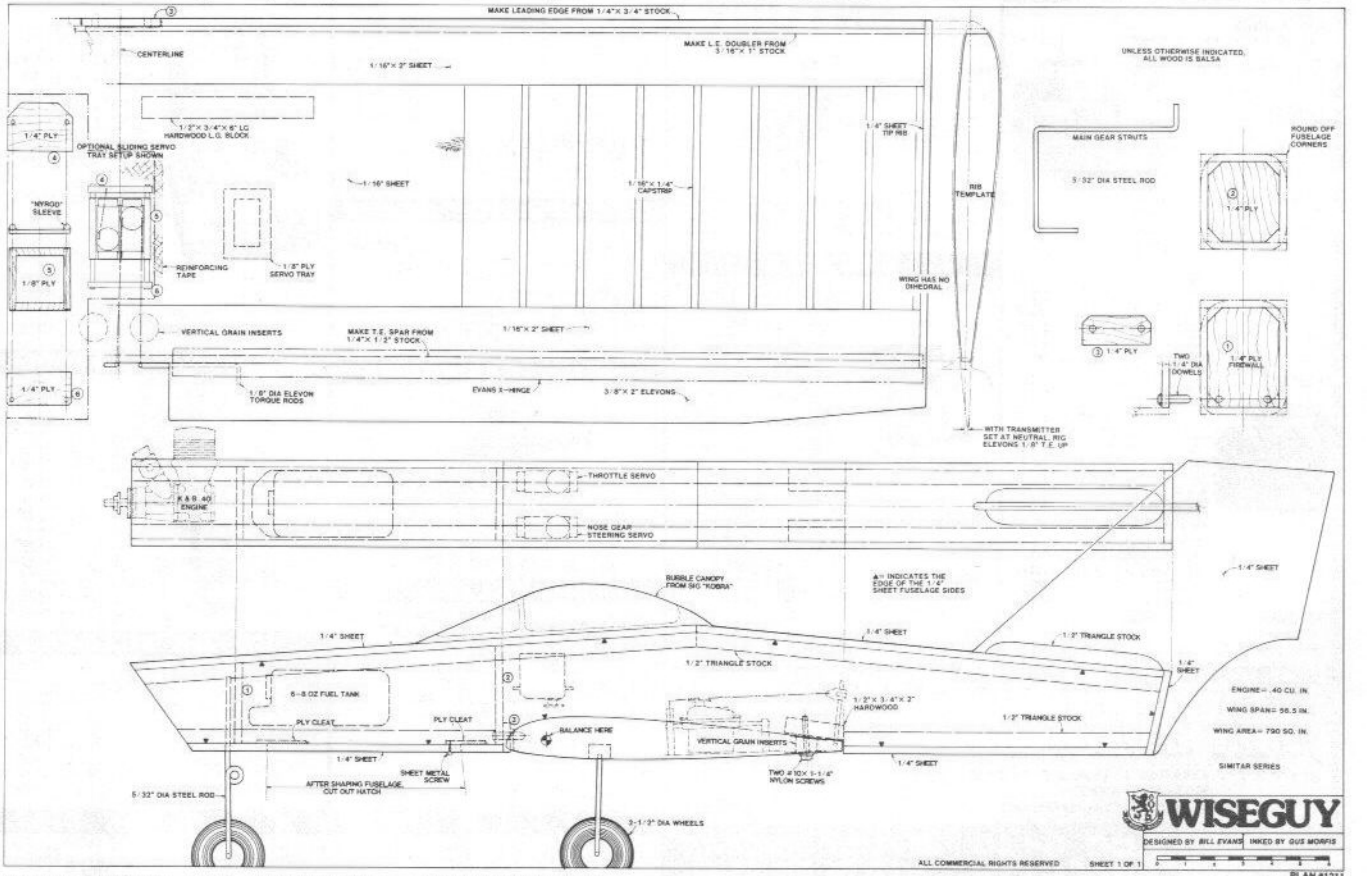
Ah yes, flight performance of the Wiseguy is very smooth and graceful; gives the feeling that it's an extension of yourself in the air; seems to always do the right thing, often before you command it. Are the thumbs quicker than the eye? Bill Winter said to me, "Why does my Simitar do what I want it to before I tell it to? Does it read my mind?"

Remember, be safe, be kind, have fun! And tight turns!

Reference Material

For more information about the development of the Simitar Series, refer to the following listings in *RCM*:

February '95, Zipity-do-dah	(64" Fun Ship 28-40).
March '91, Pole Star	(50" Jet Looker 40-60).
January '90, Leading Edge	(twin fin 40 powered Jet Look).
March '88, Desperado Sixty	(60" anhedral rocket)
March '88, 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).



FULL-SIZE PLANS AVAILABLE — SEE PAGE 200