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Like the sensational Simitar, the author's Twin 19-powered version is a sensational flier—an engine out means nothing at all. ■ Dave MacRoberts

The first twin-engine RC flying wing! An effort that has dispelled many of the myths about twin-engine configurations. Building and flying this first twin flying wing has proven that you need not have contra-rotating props or perfectly synchronized engines. Also, I have experienced sustaining flight, as well as performing most acrobatics, on either of the engines alone.

After building and flying the Simitar (RCM, Dec. '76) and Simitar XV (Model Aviation, Dec. '76), both designed by Bill Evans, the idea of building a twin Simitar got the better of me. So, on one of my trips to Southern California, I asked Bill what he thought of the idea. His reaction was to pull out a set of Simitar plans and draw in twin nacelles and alter the fuselage. With those drawings, some of Bill's ideas, a set of Simitar cores, two Cox Medallion .09s, mounts, tanks, etc., I returned to my home in Bishop.

After four weeks of building, which included many sessions until 3:00 a.m., during which I was constantly plagued with the doubt that it would fly, the Simitar Twin was completed. Since the finish included silked and doped fuselage and nacelles, I placed the Twin in the 1977 MACS show exhibition section at Anaheim, California. While at the show, I heard many comments about how the Simitar Twin would snap-roll after one of the engines quit. With my confidence completely shattered by such remarks, on the rainy Monday after the show, Bill and I unloaded the Simitar Twin for its test flight at the L.A. Model Airport. With the intermittent rain there were no other fliers at the field and only one other car which held two spectators—just as well, I figured.

We fueled up each tank and test ran the new engines. Bill lent his tack to someone so I tuned the engines by ear. The ship is set up with two channels, using only elevons, without engine control. For some reason, on the test run on the ground the right engine quit about 90 seconds before the left. We expected the same result in flight.

Again we fueled both tanks and started both engines. After tuning the engines by ear, and with a lump in my throat, Bill nodded for me to hand launch into uncertainty my work of four weeks. Long before this moment I had decided Bill would test hop the Twin, even though he assured me that it would be "a piece of cake." I remained

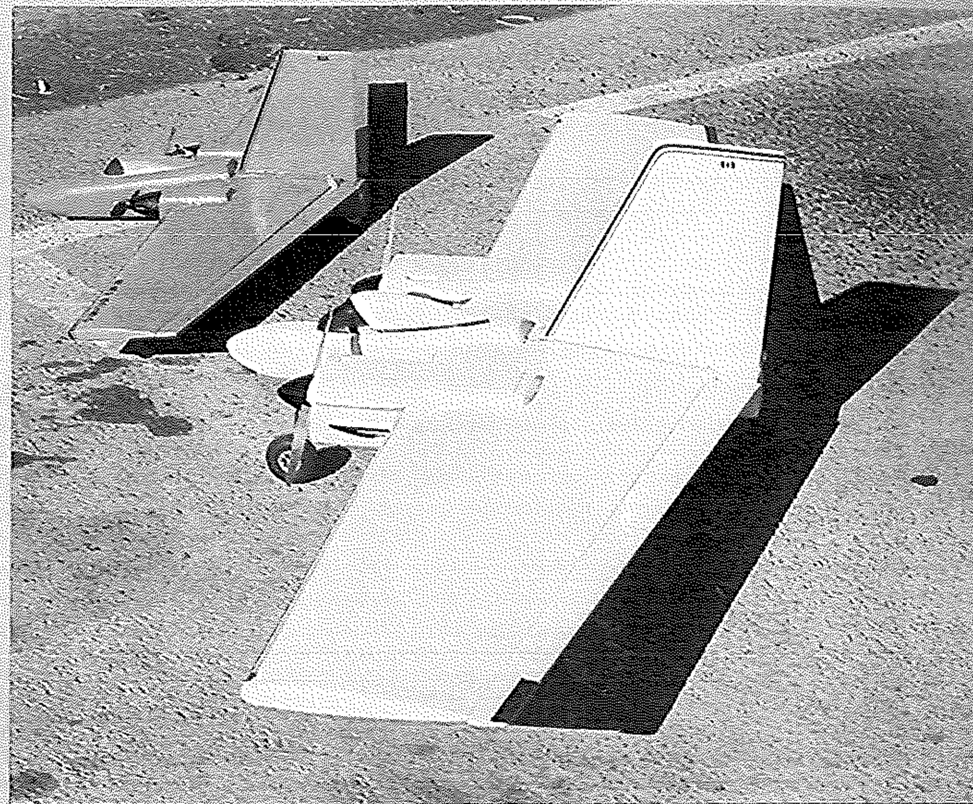
Seen from a low angle at the flight strip the Simitar might be some full-scale business twin. Its foreshortening is not evident. It scrambles from the strip like a scalded monkey.

SIMITA

firm and insisted that he have the honor to test fly.

There was a break in the rain as the roaring Twin left my hand. It went straight out, climbing gently into the gusting 15K wind. I turned to Bill with a smile that turned to shock—he was standing holding the transmitter at his side in his left hand, his right flying thumb on his hip. After seeing my concern with the ship about 200 feet out, he made a gentle left turn, flew by, then a sharp right turn, did a fly-by out to a split-S, then rolled—insides, outsides and inverted. I couldn't believe the performance. In the next instant I had the transmitter in my hands duplicating all the maneuvers I had just seen, plus a spin. Truly, it was "a piece of cake."

After about five minutes on the stick and with the thought of the inevitable single engine flight, I used the familiar phrase, "you take it." Bill had it for about two more minutes before the twin sound became solo. He asked me if



R TWIN

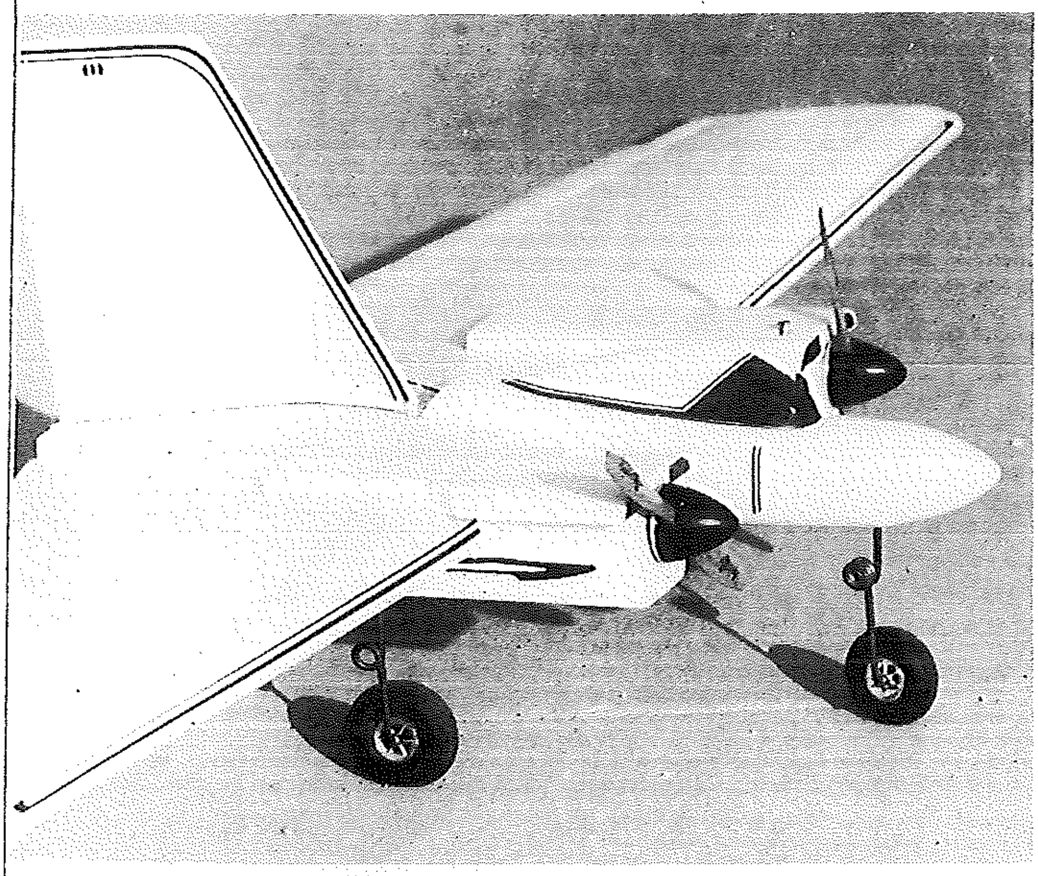
If a political cartoonist did one of these exaggerated sketches of some real aircraft it might look very much like our truncated Twin.

I could see which engine quit. Since the flight handling had not changed, he couldn't tell by feel. A low pass showed the right had stopped.

Altitude was maintained by only the left engine (flying weight 3½ lbs.). The real test came with left and right turns, as well as loops and a fairly decent roll with one engine. It was a great help to keep the air speed up (nose down) when on one engine. Both engines stopped, the landing was well placed on the center line of the runway. It was all in one piece. I beamed from ear to ear.

Bill's smile made it clear that, though he never voiced any doubt, he too had shared my apprehensions. It again began to rain and as we ran for the car, Bill said how about an NSST B #1—Negative Stagger Simitar Twin Bipe #1?

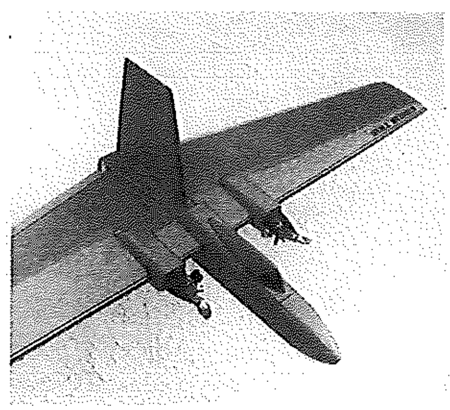
The Simitar Twin .09 project had been most successful. I maintained flight on one Medallion .09 at 3½ lbs., and the Simitar Twin .049 that followed also flew very well. Work began on the Twin .19. This one included tricycle landing gear and separate engine controls. To conduct single-engine tests the .19 Twin was set up with the left engine control on the normal throttle stick and the right engine control on the auxiliary channel.



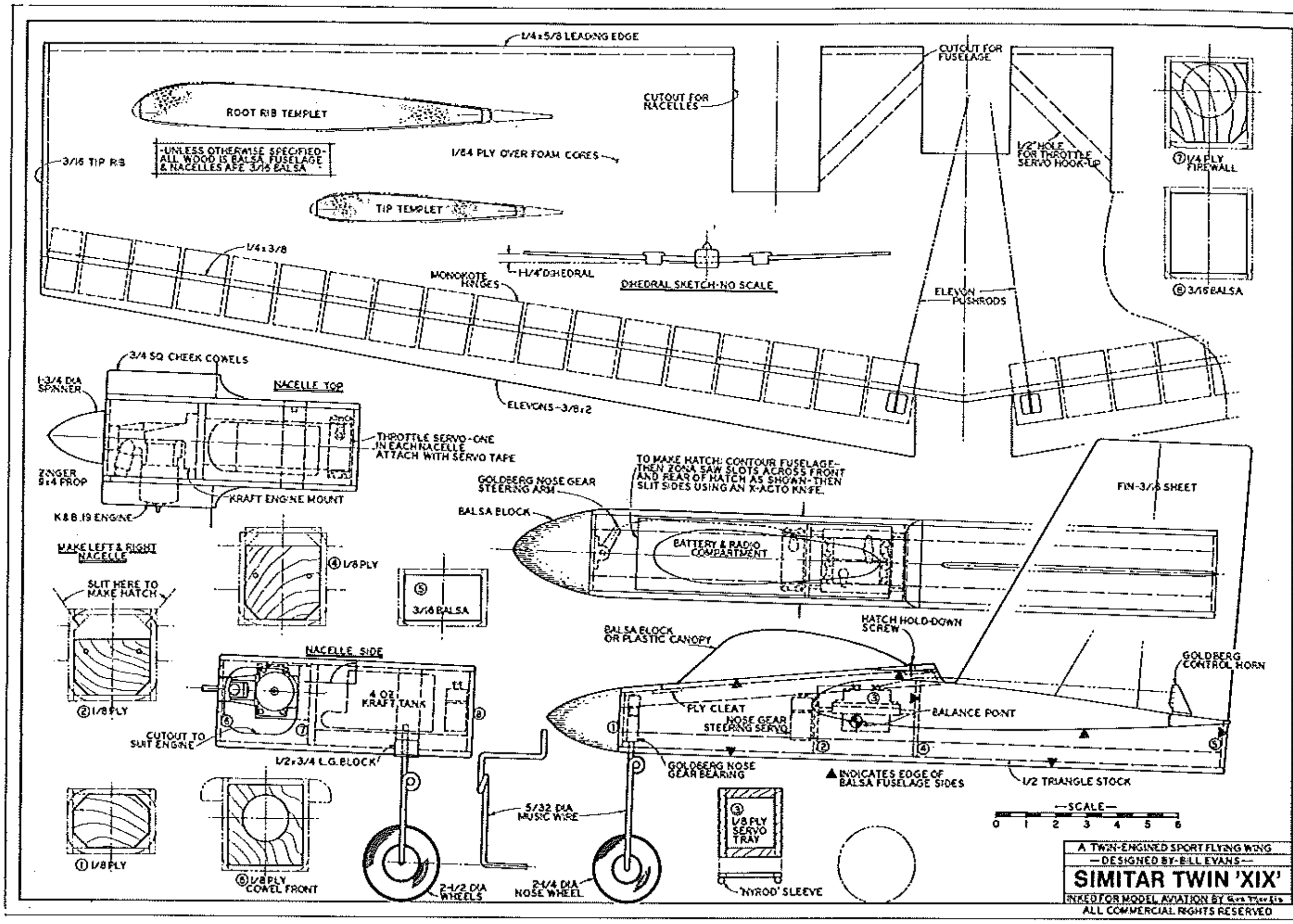
Flight tests using the independent engine controls showed excellent single-engine performance (with either engine throttled back). No opposite trim or stick pressure was required on single engine, except when both engines were throttled back and instant full throttle was applied to one engine. In this case the sudden surge of power on one side required opposite stick pressure to correct. However, only until the initial torque was overcome, then flying on one was business as usual.

Though single engine flight is "a piece of cake," takeoff on one engine is difficult. There is ample power for single-engine takeoff, but it is difficult to hold the ship straight on takeoff roll due to the tendency for the nose wheel to skip and bounce when trying, on the ground, to turn the ship into the single engine being used for takeoff.

Single-engine landings are fine, but plan your approach so as not to require instant full power



After the success of a 3½-lb. 09 Twin, followed by a Cox .049 Medallion bird, it was decided that the .19 Twin would have fixed tricycle landing gear and independent engine controls. It's an eyecatcher both at rest and in the air, especially the latter! Above: The .049 version, longer nosed because of absence of nose-wheel weight. Note the CG shown on plans.



FULL SIZE PLANS AVAILABLE . SEE PAGE 128

for, as mentioned before, instant full power on single engine will require opposite roll correction, and some down elevator until speed is constant.

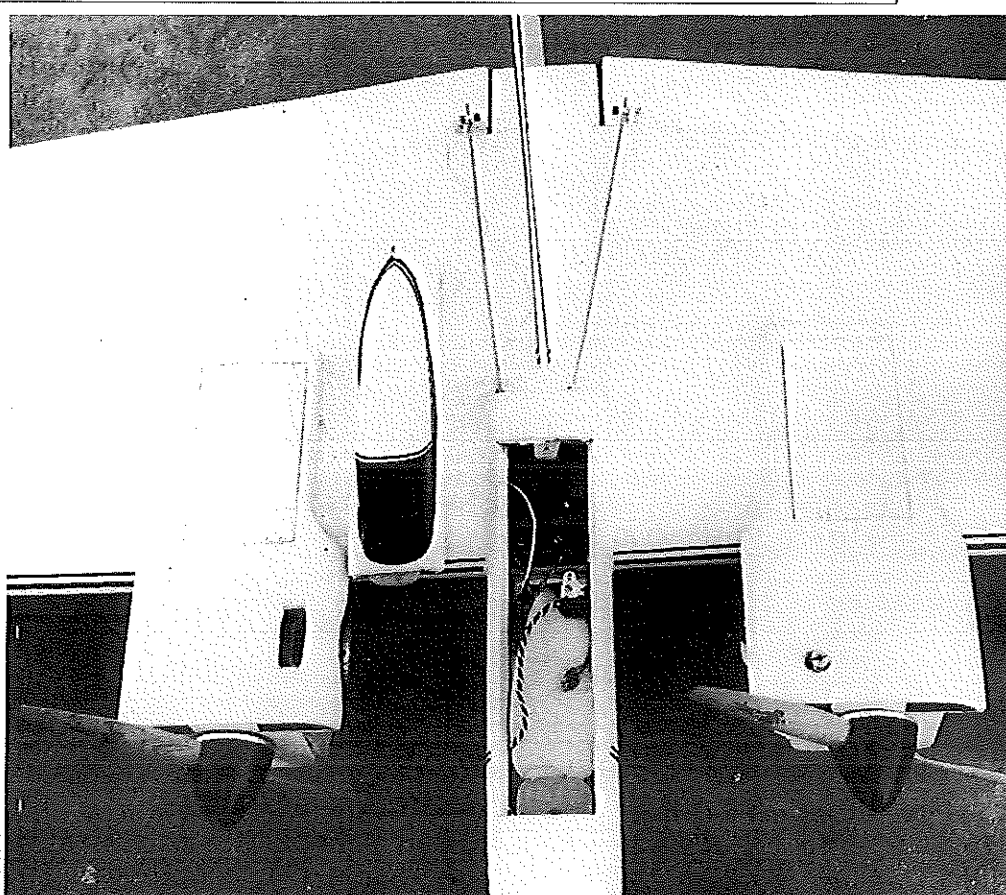
(For your convenience cores and 1/64" ply sheeted cores are available from Soaring Research, 19216 Calvert St., Reseda, CA 91335.)

Construction

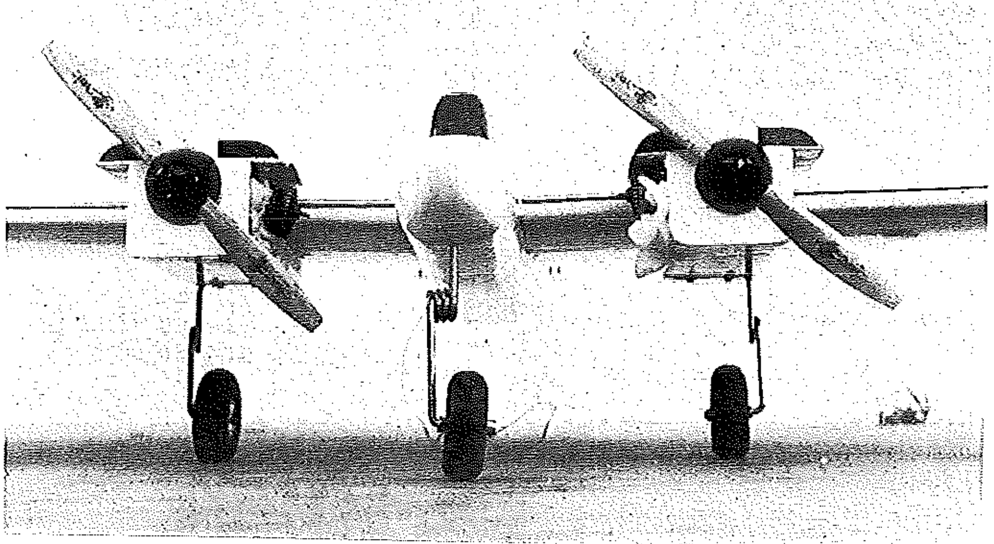
Glue and pin the ¼" balsa leading and trailing edges to the foam cores. Be sure to keep the surfaces free from bends or warps. Placing the cores (with the leading and trailing edges attached) in the foam cradles, while the glue is drying, will help keep them straight. Set these assemblies aside to dry.

Cut out parts for fuselage and engine nacelles. (Sides, bottoms, tops, firewalls, etc.) Pin fuselage bottom down on flat surface and glue and pin fuse

Editor's Note: In the December, 1976 issue was published one of the all-time "Sleepers," Bill Evans' Simitar. At the top of the plan list for more than two years, it was built by the thousands as plans were passed around. The reasons were its stark simplicity and phenomenal flying performance that did not require super pilots—nothing more than a foam wing and a fin. Since then, on our suggestion, purist Evans conceded that a landing gear would enhance realism and extend the performance envelope—and he used gear on later versions. Simitars have been built in all sizes from a tiny 02 version to a Vulcan-like Quadra Twin. A Simitar Novice won at Winter Nats—against the Dirty Birdy and other famous pattern craft, and that leaves room for thought. The twin-engined versions have spine-tingling performance, handle extremely well with engine out, and again, a super pilot is not required. We think Dave's twin here presented may be another sleeper.



Tank access hatches located on top of each nacelle, radio gear fully exposed when cockpit/hatch removed. Pushrods run to each elevator/aileron. One servo slides the servo tray for down and up, allowing each surface to be controlled independently like normal ailerons.



Front view shows landing gear detail. Retracts in this particular configuration—even if bigger—could shift CG beyond the limits of stability and control ranges. Paper toweling stuffed into nacelles absorbs fuel and obviates spills on the car seat.

sides to fuse bottom. Glue and pin corner bottom triangles, then glue in top triangles and fuse top.

Glue and pin nose block, plywood nose-wheel mount and rear former and set assembly aside to dry. Pin nacelle bottom to flat surface, then glue and pin nacelle side to bottom, and finally glue and pin in top corner squares.

Glue and pin in place the firewall. Pin and glue nacelle top in place, then front and rear nacelle formers.

Glue and pin on nacelle cheek blocks and repeat for second nacelle, and set them aside to dry.

Remove pins from wing leading and trailing edges, then trim and sand leading and trailing edges so skins will fit nicely over them. Cut wing sheeting to size, using 1/16" sheet balsa or 1/64" plywood. Use a water-base contact cement or Corefilm sheeting tape to bond wing sheeting to the cores.

Use five-minute epoxy to join wing panels, setting 1" blocks under each tip to correct dihedral. Glue and pin ¼ balsa wing tips to wings.

Sand fuselage and nacelles to shape and make hatch cutouts per plans. Make cutout and install landing gear blocks. Cut and sand elevons and rudder to shape. Sand wing. Cover all components using your favorite iron-on covering.

Install engine, mounts, tanks, throttle servos, links and arms. The original Simitar.19 twin was built with a servo in each nacelle. Servo extension leads were used to plug into the receiver. Both servos may be plugged into the receiver engine control by using a Y connector. To facilitate single-engine performance on the original ship, the left engine servo was set up to operate on the normal transmitter throttle stick and the right engine control was set up on the auxiliary channel. Since this separate engine control set-up was for test only, I suggest that you may wish to use the Y set-up that will permit operating both engine servos from the same stick.

Mark the wing for cut-outs to accept the fuselage and nacelles and notch for same. Fit nacelles and fuselage to wing. Remove the portion of covering on fuse and nacelles where they will be epoxied to the wing.

Set the wing on a flat surface and slide the nacelles into place. Block the wing up to have the same clearance from the surface under each tip. Square the nacelles with the wing so that each is dead ahead (at a right angle to the leading edge) and the thrust line is at zero to the wing (wing incidence zero, engine thrust zero).

After checking nacelle alignment, attach the nacelles to the wing with 5-minute epoxy. After the nacelles are epoxied in, run a bead of epoxy around the nacelles where the nacelles meet the wing. Fit fuselage to wing and epoxy in place. Use the same alignment technique you did for the nacelles.

Install radio and landing gear per plans (modify as necessary for your particular radio). Epoxy rudder in place. Install elevon hinges per plans. To provide necessary reflex, the elevons should be set about ⅛" *above* normal neutral aileron position.

A special detail on Clark's cutaway drawing shows the aileron set-up. Two servos ride on one tray which slides on two dowels—so the servos can be moved fore and aft for elevator action. The tray is made to slide by means of the second servo which has an anchor wire attached to bulkhead.

A single-engined fly-by—or was one engine really out of gas? Whenever we show a flight shot of one of these things some shutter expert "proves" the crate was really suspended by strings. There is a turning prop on that engine. Insert; Engine out—wings, wheels and things.