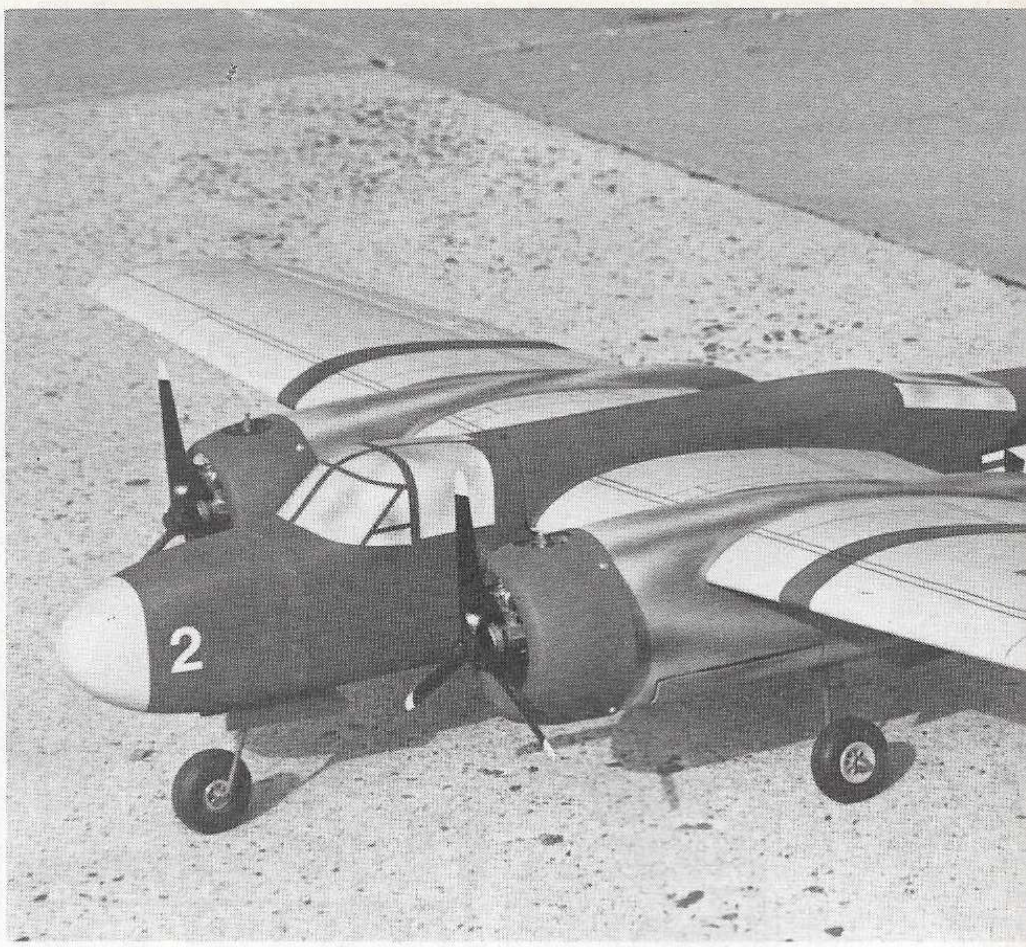


PHOTOGRAPHY: DICK SARPOLUS

The Douglas A-26 *Invader* had a long and illustrious career as both a military and a civilian aircraft. Dick and modeling buddy Harry Lawrence came up with this sport scale version. Paint scheme is Navy's JD-1.

an R/C Fun Scale...

A-26 Invader

By Dick Sarpolus

A veteran of two wars, this lean fighting machine makes a great fun-scale R/C twin. Features easy sheet construction.

The B-26 *Marauder* was made by Martin and the A-26 *Invader* was made by Douglas; both were designed and produced for use in World War II. Around 1947, with the B-26 *Marauders* scrapped, the *Invader* was redesignated as a B-26. They later saw a lot of use in Korea, and the French Air Force used the *Invader* in their Indochina and Algerian actions. By the early 1960's most of the Air Force B-26's were out of service, mothballed in Arizona. A few years later, *Invaders* were pulled from storage, rebuilt with strengthened wings and other modifications, and again designated as the A-26, this time for use in Vietnam. By 1970, the *Invader's* fighting career was over and they were headed for the scrap pile.

Their long military career has made the A-26 *Invader* a popular and easily recognized aircraft. For modeling purposes, its proportions are nearly ideal to provide a good flying R/C aircraft. I would be reluctant to model the B-26 *Marauder,* although it has been done. Its tapered wing with not too much area looks tricky, and the round fuselage would require more complex construction techniques. This A-26 model is stand-pretty-far-off scale; my primary aim was to get an easy flying twin engined model, easy to build, with a reasonably scale appearance.

The project started out to be a DeHavilland *Mosquito;* my good friend Harry Lawrence had two OS .19's he wanted to use in a twin engined model, and he preferred the *Mosquito.* I tried to convince him that the *Mosquito's* mid-wing configuration and round fuselage weren't suited for a quick-build project, and the result was our A-26 *Invader.*

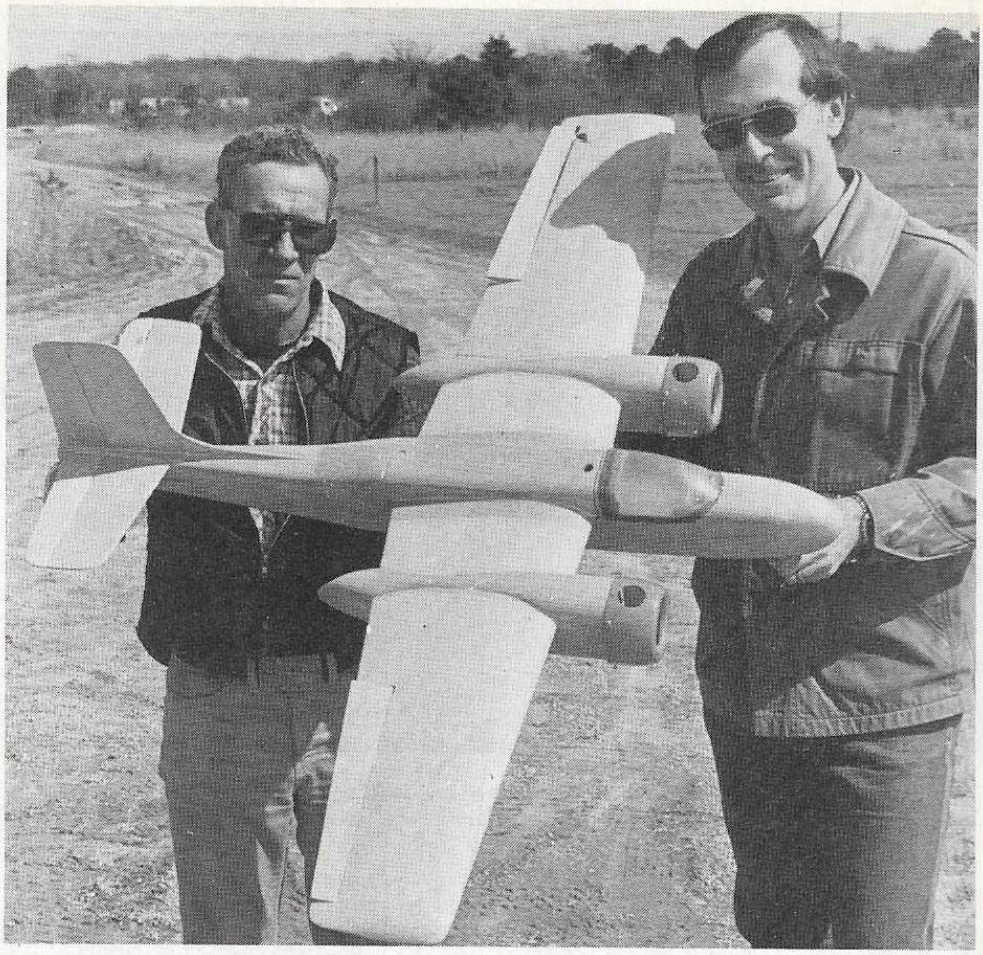
As a scale reference source, I used the Squadron/Signal publication, *A-26 Invader in Action.* This book provided a good 3-view drawing along with many, many photographs of all the A-26 details and design variations. After I had completed the construction plans, Harry built the prototype model, doing a beautiful job on it. With it prepped for painting, we selected an unusual Navy yellow and blue color scheme to be different. The Navy used a few A-26 aircraft, designated the JD-1, as a target tug. This article could have been titled the JD-1, but who ever heard of a JD-1.

I painted the model, and with some panel line details inked on, we were pleased with what we thought was a unique scale project. Then Bob Hunt, FM's editor, told us that an A-26 also in the Navy color scheme had appeared on an FM cover about twenty years ago. So much for our unique aircraft. With so many A-26 variations having been produced, and with it having been used by so many foreign air forces, there are plenty of scale versions and paint schemes to choose from.

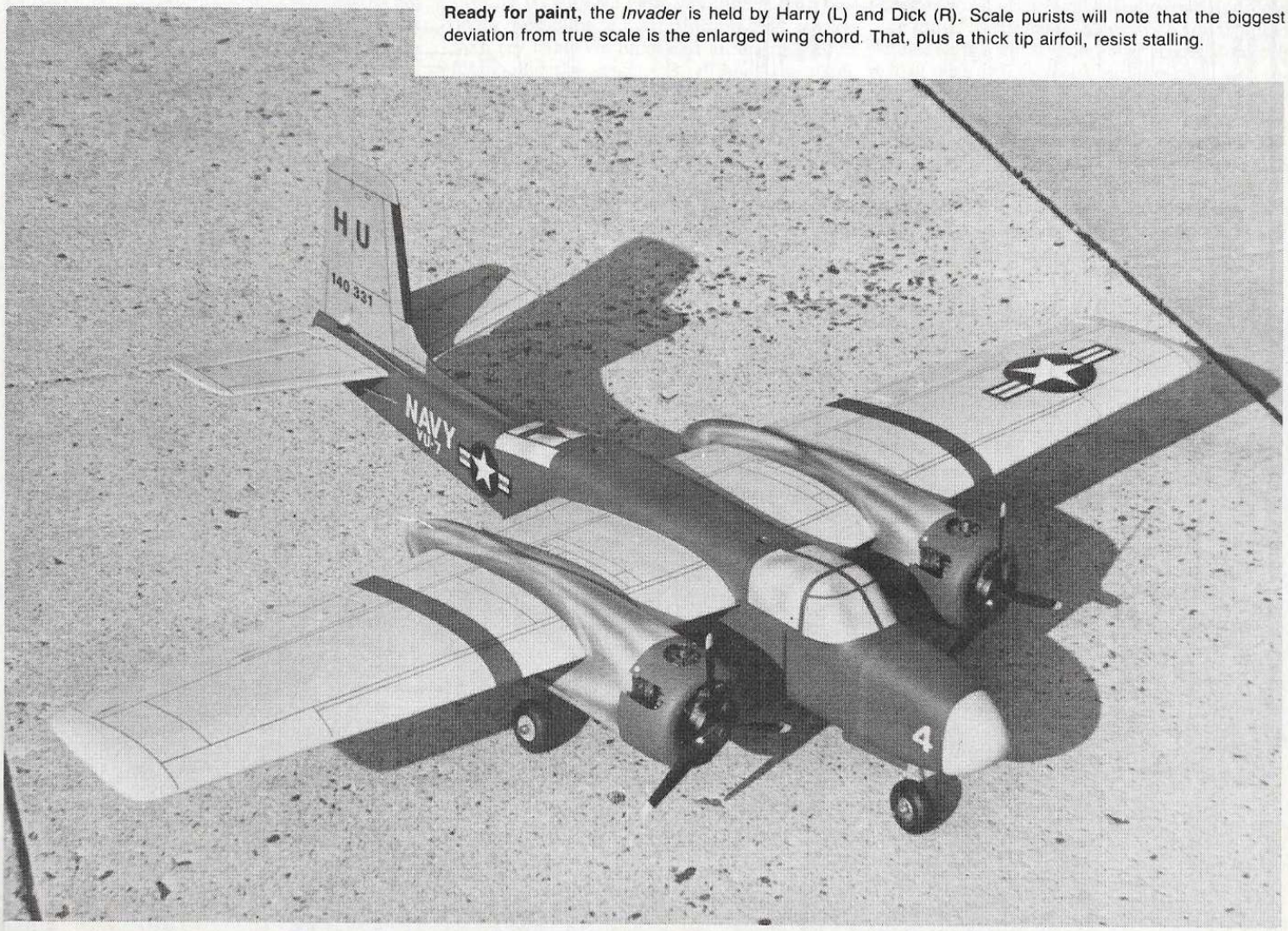
In laying out the model design, the biggest intentional deviation from scale was an increase in the wing chord, to get more wing area while still trying to keep the overall appearance close to scale. I was concerned about the power available from two tired old OS .19s, so wanted to keep the model to a reasonable size for the engines. The result was a wingspan of 54 inches and a fuselage length of 42 inches. The wing area is 480 square inches, and a semi-symmetrical airfoil is used for good lift and flight characteristics. The root airfoil is 17% thick and the tip is 18% thick; the result is that this wing doesn't want to stall. Horizontal stabilizer area is 19% of the wing area, maybe a little small but okay. The vertical fin area is about 11% of the wing area, more than enough for stability. I wanted plenty of vertical fin area for safe single engine flight operation.

Construction is conventional and straightforward. The fuselage is a basic box, with triangle stock in the corners to permit rounding to shape. Tail surfaces are sheet balsa. Engine nacelles are box construction with shaped blocks where needed. Engine cowlings are made from the plastic bottoms on large soda bottles; their diameters were reduced by cutting and overlapping to get the right size. The paint used, butyrate dope, didn't stick too well to the plastic cowls but they're sure low cost and easy to use. Rather than try to vacuum form a clear plastic canopy, the canopy area was shaped from balsa blocks and airbrushed to simulate the window areas.

The wings are conventional with top and bottom spars and are completely sheeted with 1/16 inch balsa. A built-up wing was used rather than foam as we felt it would be easier to install the aileron bellcranks and throttle linkages in the built-up structure. The completed wing, with two engines, seems heavy—but the fuselage seems light. The total weight of the prototype is 5 3/4 pounds. We had to add several ounces of lead to the nose to get the correct balance point. The two OS 19's handle the weight with no problem, but



Ready for paint, the *Invader* is held by Harry (L) and Dick (R). Scale purists will note that the biggest deviation from true scale is the enlarged wing chord. That, plus a thick tip airfoil, resist stalling.

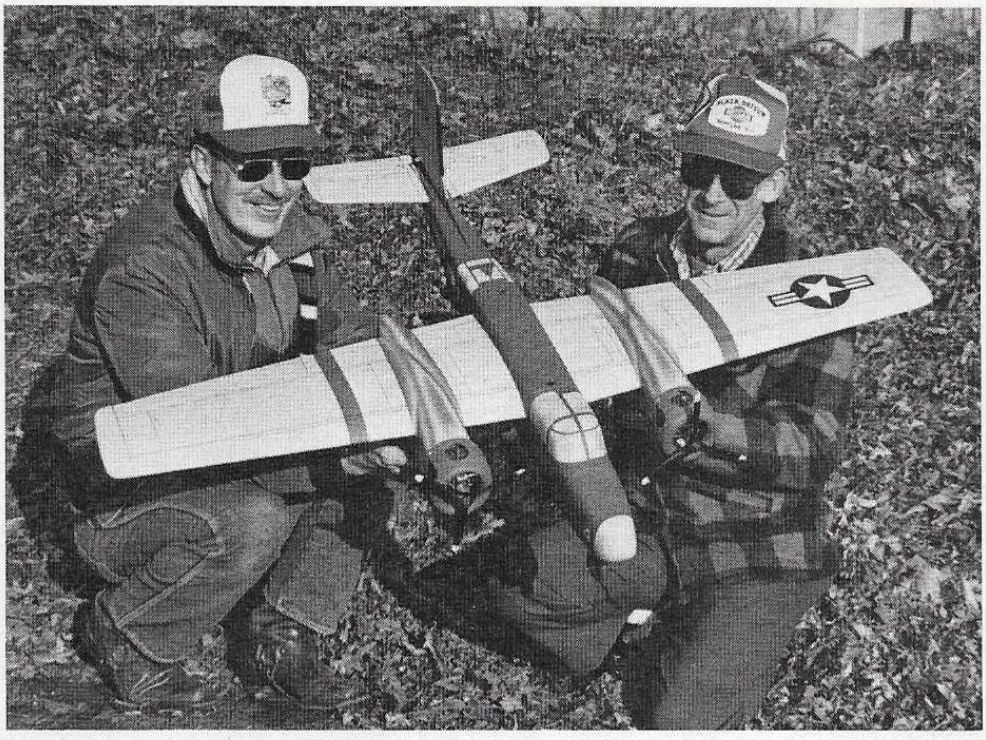


Two, trusty O.S. 19's provided the power for the prototype. The bottoms of plastic soda bottles served well as the engine cowls.

a lighter wing loading is always beneficial. Keep the tail light; select at least medium balsa. Install the battery pack as far forward as possible, also the servos and receiver. We hadn't done this; I expected the model could end up noseheavy. The wing panels outboard of the nacelles don't have to be fully sheeted as the prototype was, to save a little more weight. We're sure the plane could be considerably lightened with these procedures, a better selection of wood, and the use of instant CA glues.

Originally, we had a plastic canopy that looked pretty close to the required shape, so it was glued in place and then painted along with the rest of the plane. That seemed easier than shaping the canopy area from block balsa. About a month after the plane was completed, that painted-over plastic canopy sunk in so far that it had to be cut out and replaced with balsa blocks. Painting over a plastic canopy is one trick we'll never try again.

We finally got a break in the cold New Jersey winter for the test flights. We used 8×5 props and DuBro mufflers on the OS .19's. Using a Royal ProTach, each engine was set at 12,500 RPM and a reasonable idle also adjusted. The engines sounded great and seemed to produce plenty of power. We fly from a grass field, and there was a pretty good wind for the first flight. The plane accelerated rapidly on the ground, and with a touch of up elevator it was flying, up at a 45 degree angle. It was then we realized the model was tail heavy, and the first flight was a tough fight trying to keep the plane flying smoothly. Even tailheavy, there was little tendency to snap, fortunately, and a good uneventful landing was made. I had checked the balance, and hadn't done it carefully. Moving the battery pack forward in the fuselage and adding several ounces of lead in the nose block gave the correct balance, and subsequent flights were fine. The two OS .19's are plenty of power for this plane. We'll try 8×6 props in the future, and run the engines slower.

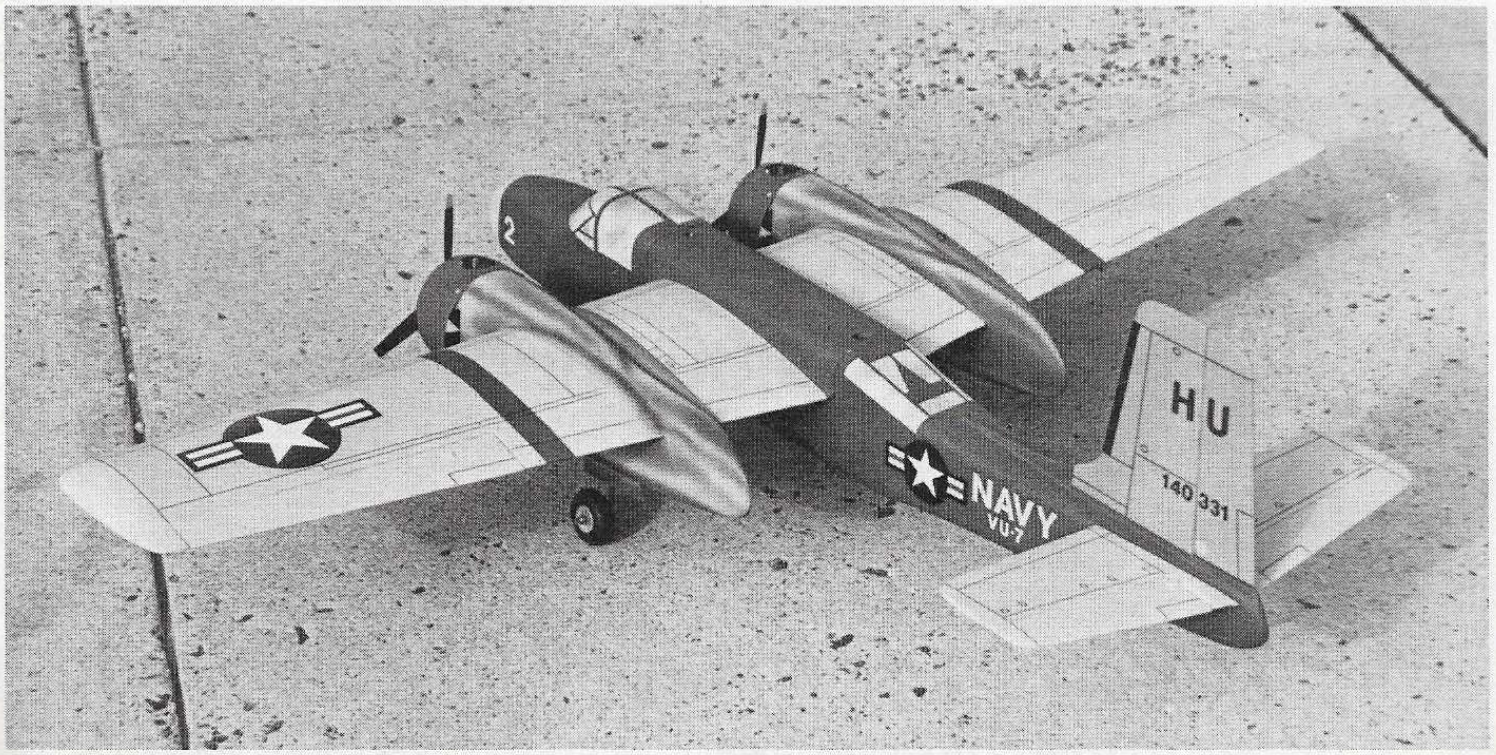


After a successful, but cold test flight, Dick and Harry pose with the Invader. Those 3-blade props, by the way, are only for display. The plane was flown with 8-5 props. All the panel lines were done with pen.

The plane handles pretty much like a sport pattern model; rolls, loops, and inverted flight are easy although we don't plan to get too wild with it. Flaps aren't needed as it will slow up enough for easy landings. Bomb bay doors would be a fun addition and maybe we'll try that. We have had an engine fail in flight, and the single OS .19 kept the plane flying easily, even climbing slightly. It was difficult to turn away from the dead engine, possibly because of the wind at the time, so I turned into the dead engine, cut the power and came in for a landing. As with most scale twins, the safest procedure in the event of an engine failure would be to cut power and land.

Construction

As usual, I suggest you cut out all the parts before beginning any assembly work; in other words, make your own kit. Beginning with the fuselage, the plywood doublers are glued to the sides, along with the triangle stock on the upper and lower edges. Join the sides with the formers, pulling the sides together at the tail. Before completely enclosing the fuselage, cut holes in the rear formers for the rudder and elevator pushrods. Because the horizontal stabilizer has dihedral, a dual Y-output elevator pushrod is required and should be installed now. The nose gear must also be installed at this point. Add the fuselage top and bottom, nose and canopy



In its role as the Navy's JD-1 target tug, the *Invader* sported an attractive blue and yellow color scheme. Oil stains on nacelle were airbrushed.

blocks, and carve/sand to shape.

The tail surfaces are cut from sheet balsa and glued in place. For fillets, we use five minute epoxy mixed with microballoons and form the fillets with a fingertip. Cut the slots for the nylon hinges but don't glue the hinges in place until the finishing is completed.

The wing panels are built on a flat work surface; the "feet" on the ribs insure correct alignment. Pin down the lower spar over the plans, add the ribs, top spar, leading edge, and partially sheet the upper wing surface with 1/16 inch balsa. Leave enough open areas so the bellcranks and linkage for the aileron and throttle controls can be added before the wing is completely sheeted. Remove the wing from the building board, trim the feet from the ribs, and sheet the bottom surface. Cut the ailerons from the wing panels, trim the leading edge of the ailerons at an angle as shown on the plans, and sheet the open edges to permit hinging the ailerons. Join the wing panels at the correct dihedral angle.

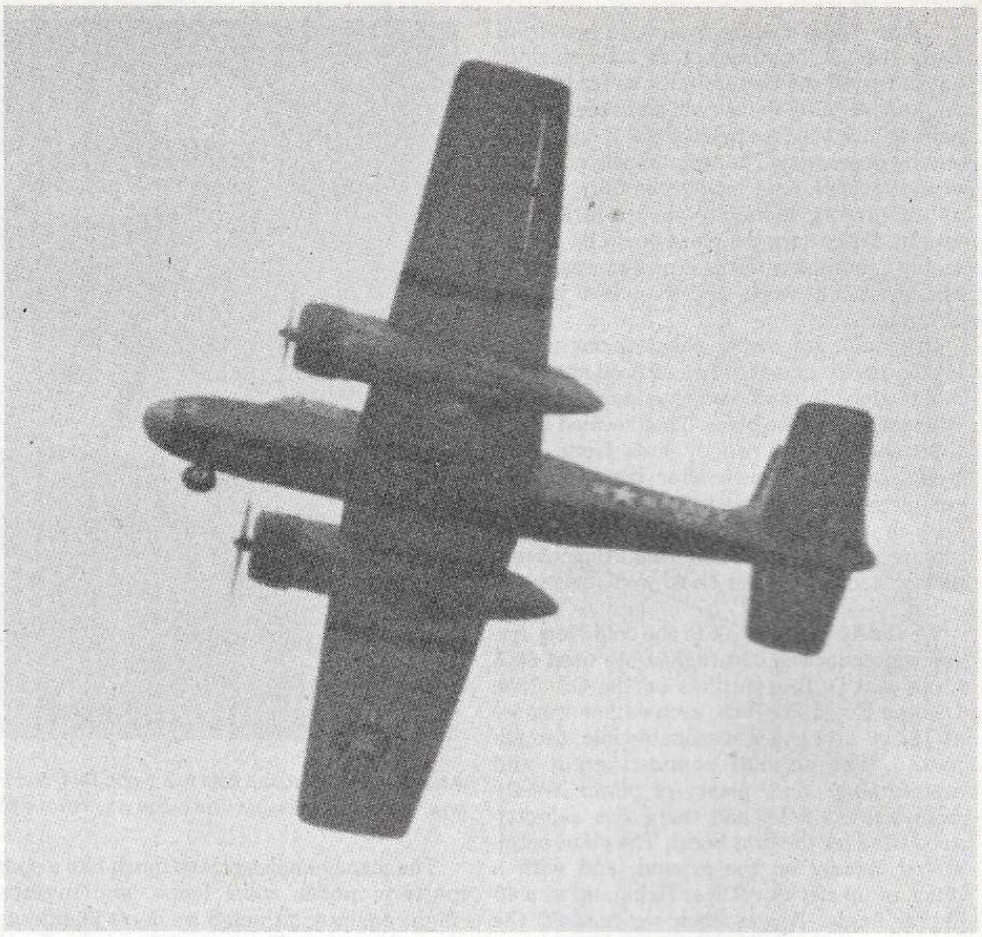
The engine nacelles are assembled from the side pieces, plywood doublers, and the three bulkheads. The nacelles are epoxied to the wings and the lower wing leading edge sheeting can be trimmed away if needed for fuel tank clearance. The main landing gear legs are clamped to the middle nacelle bulkhead. Install the engine mounts and engines temporarily so the throttle linkage can be added. The engines can be installed upright or side mounted; I think side mounting would be best.

After the aileron and throttle linkages are installed, the balance of the wing sheeting can be added. The nacelles are completed by sheeting the bottoms, adding the rear and top blocks, and carving/sanding to shape. The original model used plastic soda bottle bottoms for the engine cowlings, mounted with small screws to hardwood blocks glued to the firewall. Reinforce the center wing joint with fiberglass cloth and epoxy.

Harry's model had the nylon wing hold down bolts installed through holes in the fuselage top; for a neater appearance, the plans show the bolts installed through the bottom of the fuselage, into tapped hardwood blocks in the wing.

The wings were covered with silkspan and clear dope, while the rest of the model received several coats of Sig clear and sanding sealer. The entire model got a coat of gray auto primer and was then sprayed with Sig butyrate colors. Exhaust stains were airbrushed over the engine nacelles, and the canopy and window areas were airbrushed with white, light blue, and black dope. After the inked panel lines were added, several coats of Sig Flat-Coat clear were sprayed on for a scale-like overall flat finish.

From the time the plans were completed to the first flight took about two years, and it was worth the wait to see it in the air. Harry's not really that slow a builder; along the way he painted two houses, constructed a prize winning doll house, and fixed up several cars. He reports that the A-26 is an easy construction project, and I can say that it's a lot of fun to fly. If you have two .19's doing nothing in the old engine box, try this twin for some flying fun. There's nothing like the sound of two synched engines in a fast fly-by!



Even though this is a twin, it has none of the vicious tendencies which many twins are noted for. It flies like a sport ship, has plenty of stability, does quite well on one engine, and will roll, loop, and fly inverted.