THE F8E "CRUSADER"

From the deck of the U.S.S. Forrestal, a Marine F8U-2 catupults away. The blast of escaping steam trembles the bowels of the carrier, and only the pilot can sense the force unleashed. Pilots are fond of the aircraft.

A mind-bending scale project that cries for flight. Add this jet-age classic day fighter to your building schedule. Micro Avionics and a wild roaring .60 give it life. 64" overall, 58" in span.

Designed by Franz Meier

The sight of the *"Crusader"*, with its long cigar-shaped fuselage and swept wing, is familiar to those who followed aviation after World War II. Winner of the U.S. Navy design competition for a new supersonic day fighter over seven other aircraft manufacturers, it had a maximum speed of over Mach 1 and a landing speed of under 100 knots. In February 1955 the first prototype flew at Edwards Air Force Base and during the initial 52 minute flight, proved to be capable of supersonic speed in level flight. This same aircraft, after 67 months, was presented to the Smithsonian Air Museum where it is now on display. Among the records held were the National Speed Record of over 1,000 miles per hour flown by Commander R.W. Windsor, and it was the first aircraft to span the United States at speeds faster than the speed of sound. During this speed run it was flown by Colonel John H. Glenn, USMC, who later became the first American to orbit the earth. For this flight he received the Distinguished Flying Cross.

There are many tales of the versatility of the *"Crusader"*. One is the use of the aircraft in a photography configuration to discover the presence of Russian missiles in Cuba, which led to the Soviet "backdown", and the other is the story of the Navy pilot operating from a runway in Naples, Italy, who took off and flew for 24 minutes with the wings folded as for stowage on carriers. Discovering his error while trying to level off at 5,000 feet, he continued to fly while dumping his excess fuel, then came in for a hot landing-over 200 knots-to land safely. Used extensively in Viet Nam for all missions, they were gradually replaced by the F-4 Phantom. A new version of the *"Crusader"* is the *A-7 Crusader II*, acquired both by the U.S. Navy and Air Force for combat aircraft duties throughout the world. With such a colorful history, we are pleased to present this scale model of such a famous aircraft. Color schemes and additional history are given in Profile Publication Number 90.

The model *"Crusader"* takes off in 300 feet with the flaps at 15°, The flying characteristics are very good and it is possible to do the modified AMA stunt pattern required for scale competition with a good .60 engine. Because the fuel is burnt during flight and the model gets tail heavy at the end of the flight, it becomes more sensitive to aileron commands, due to the swept wing, and it is easily controlled during the landing. During descent, set the flaps for 45° allow the model to seek its own descending air speed without forcing it up or down with the elevator command, and watch it settle gracefully on the runway. This aircraft can be built by a modeler with normal modeling skills as the construction is simple. No doubt there will be some enterprising individuals who will question whether this *"Crusader"* will fly with a pulse jet engine. This model has not been flown in that configuration, however, the pulse jet engine has an enormous capacity for fuel, gets extremely hot in the tail pipe area, and provides a noise akin to a mountain lion roar. Nor can it be said that it can be adapted to a ducted fan for power. The original prototype weighed just six pounds with engine (dry) minus the radio system.

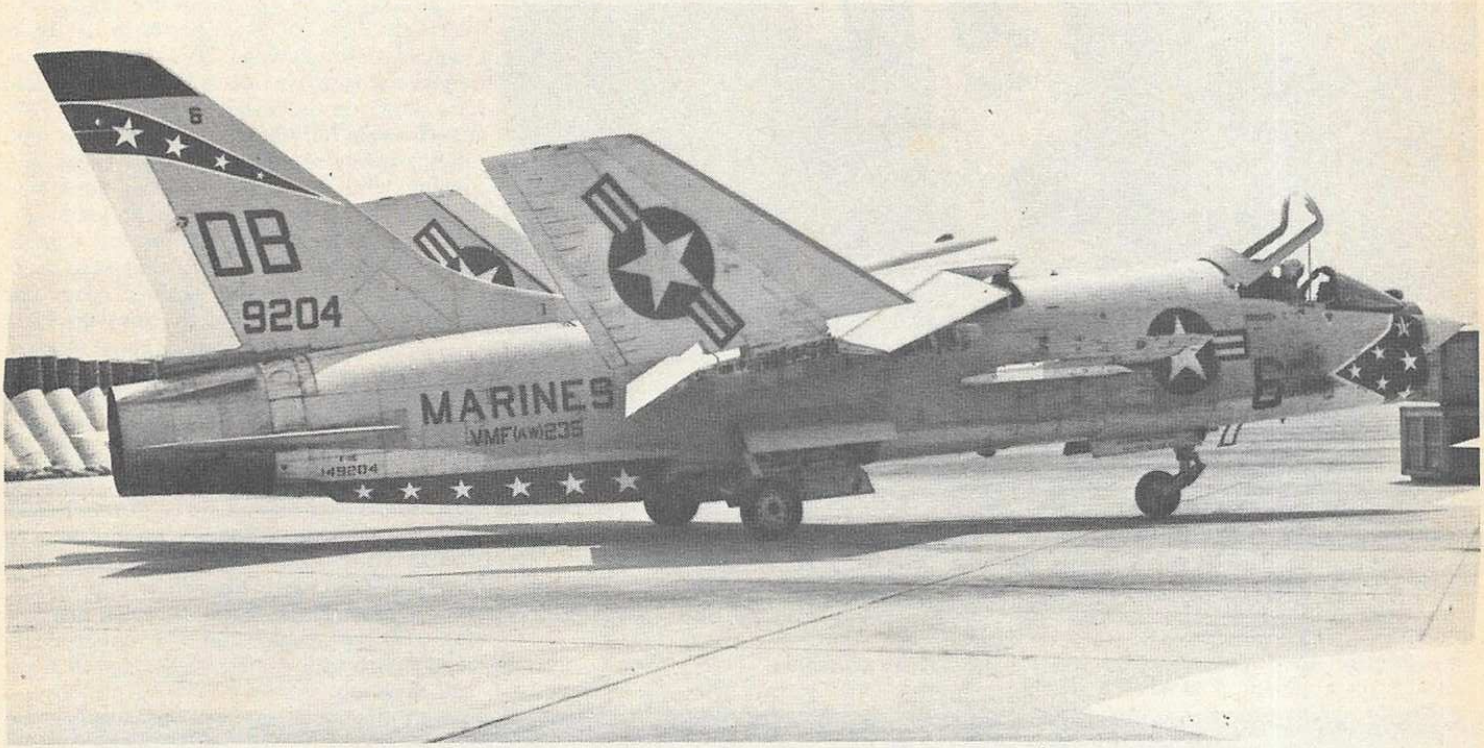
Construction of the Fuselage

Begin by cutting the two fuselage sides from hard 1/8" sheet balsa. The shape is shown by dotted lines on the side view. Next cut the plywood doublers and cement to the fuselage sides. We recommend contact cement or white glue for this task. Mark the positions of all formers when dry. Next cut Formers 2, 3B, 4B, 6B and 7B from plywood. Now cut the rest of the formers for the fuselage from hard 1/8" balsa. Note that "T" is for the Top, "S" is for the side and "B" is for the bottom of each former. Because former 6 is uniform in size, three formers are required.

Full Scale Photo Credit: U.S. Navy

Text by Dale Willoughby

First to break 1,000 mph, formidable in combat. The Crusader's name ia a legend. The aircraft is still in service. Distinctive in appearance, a perhaps difficult but very rewarding modeling project. Reach for the wood!



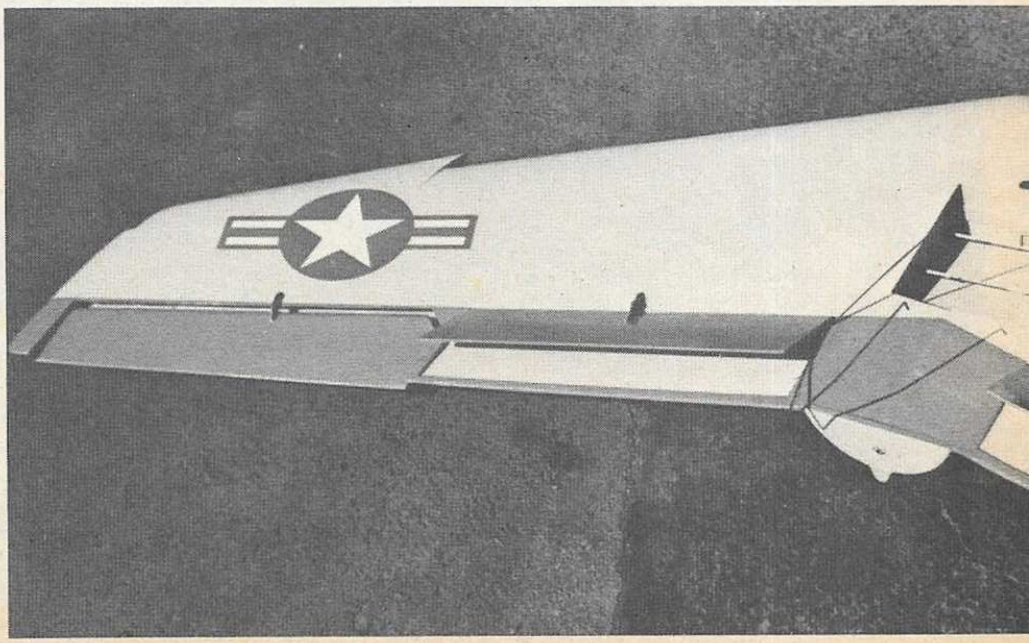
With wings folded a pilot once flew into the blue. Slight oversight! He left them that way. To extend one, then the other would not be healthy.

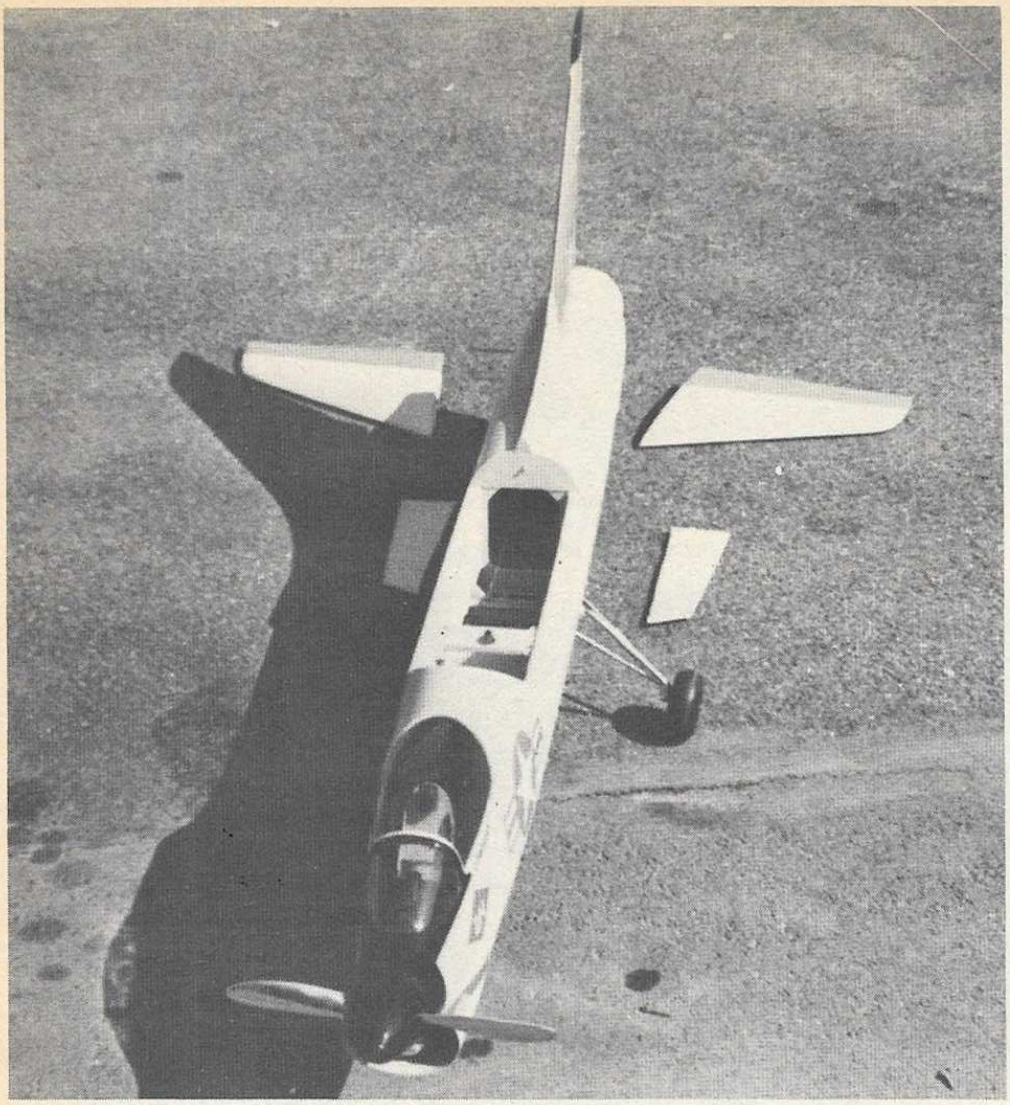
Before cementing 4B, 6B and 7B to the fuselage structure, the brass landing gear tubing must be added. Install with either "J" bolts or drill holes in the plywood and lace with wire and cement. No thought was given on the prototype to make the landing gear retractable. The landing gear is bent as shown on the plans, making a right and left leg and inserted in the tubing when the fuselage is complete.

Next install the stabilizer mounting on formers 10A and 11. The prototype *"Crusader"* used a stabilizer and elevator arrangement originally and this is shown on the plans. The second version used the all-flying tail with equal success. Only the original is shown, however, by cementing the 3/8" sheet balsa elevator to the stab, the conversion can be made. Decide which version is to be used as the control linkages must be installed prior to sheeting the fuselage sides, continuing with formers 4 through 11, using a triangle for correct alignment. Set aside to dry thoroughly.

While drying, cut out the ribs for the wing and ailerons. Next add the stringers, starting with former 2, continuing through former 14. Note that formers 12, 13 and 14 are all double formers. The afterburner section requires two formers numbered 12,

Flaps inboard, ailerons gain in sensitivity as fuel is consumed, a point in your favor when on final. Structurally the ship offers no problems.



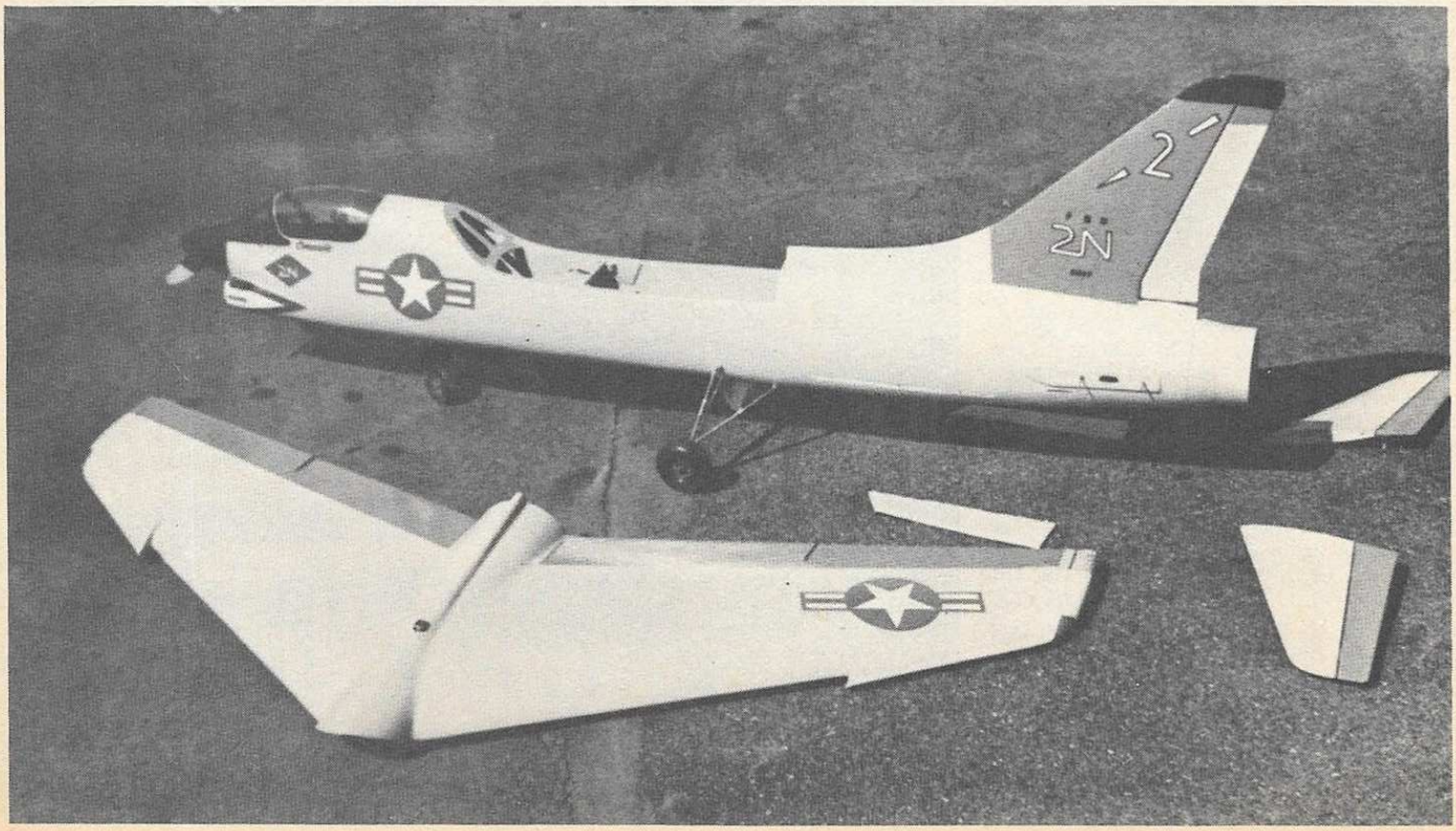


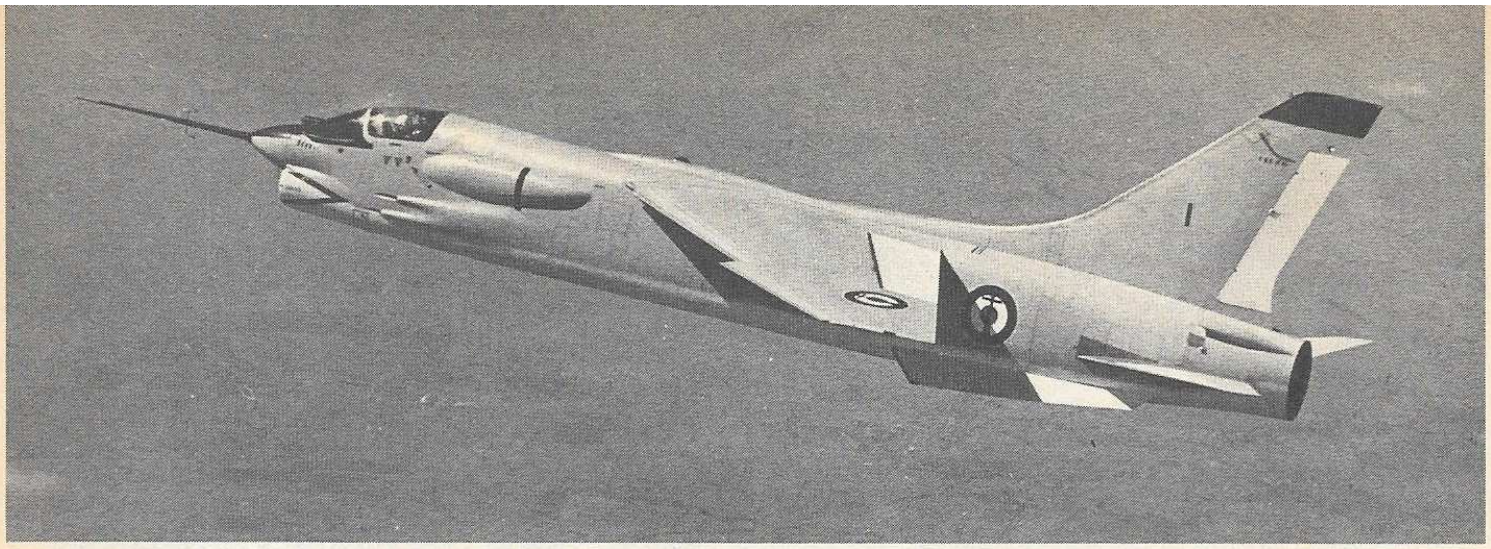
A distinctive configuration. The awe-inspiring "Crusader" makes a fine scale project for the experienced radio flyer. The radar nose turns into a spinner and the singing prop arc is not truly visible to mar effect.

two formers 13, and using the same diameter, cut one from plywood for former 14A. When all the stringers are installed and dry, sand thoroughly in preparation for planking with 1/8" sheet. Plank with medium soft balsa, first the sides, then the top, finally the bottom. The forward portion of the fuselage is shaped of balsa blocks, carved hollow, then faired into the nose lines. If necessary moisten with warm water so the balsa, will conform to the shape of the nose. The wing saddle is strengthened with 1/4" sheet shown as a balsa doubler on the plans. The formers for the wing fairing are not shown because each must be tailored to the curvature of the fuselage. This is established after the wing has been joined to the fuselage and the fairing began.

Before completing the fuselage and tail we suggest you go to the wing so you can determine of all the incidence angles are correct. The elevator platform is balsa capped with plywood. The fin is of conventional construction and the balsa sizes are shown on the plan. It is sheeted AFTER the installation on the fuselage. The rudder is made of soft 3/8" sheet balsa and joined with mylar hinges. The hardwood mount should be tailored to fit your particular engine, and we recommend a good, reliable .59 to .80 engine, well broken in and easily started. The exhaust gases are guided to the outside of the fuselage by a flattened piece of brass tubing. Before installing the engine for the final time, coat the entire compartment with Hobbypoxy Formula II and make small fillets where the unburnt fuel is likely to run. At the very bottom, fit a small piece of 1/8" dia. brass tubing for a drain. Notice that the air scoop is removable. First carve the air scoop from a balsa block, then hollow out. Coat with fiberglass and epoxy, then break out the balsa, sand and prepare for painting. Now sand the entire fuselage completely smooth and prepare for a silk covering.

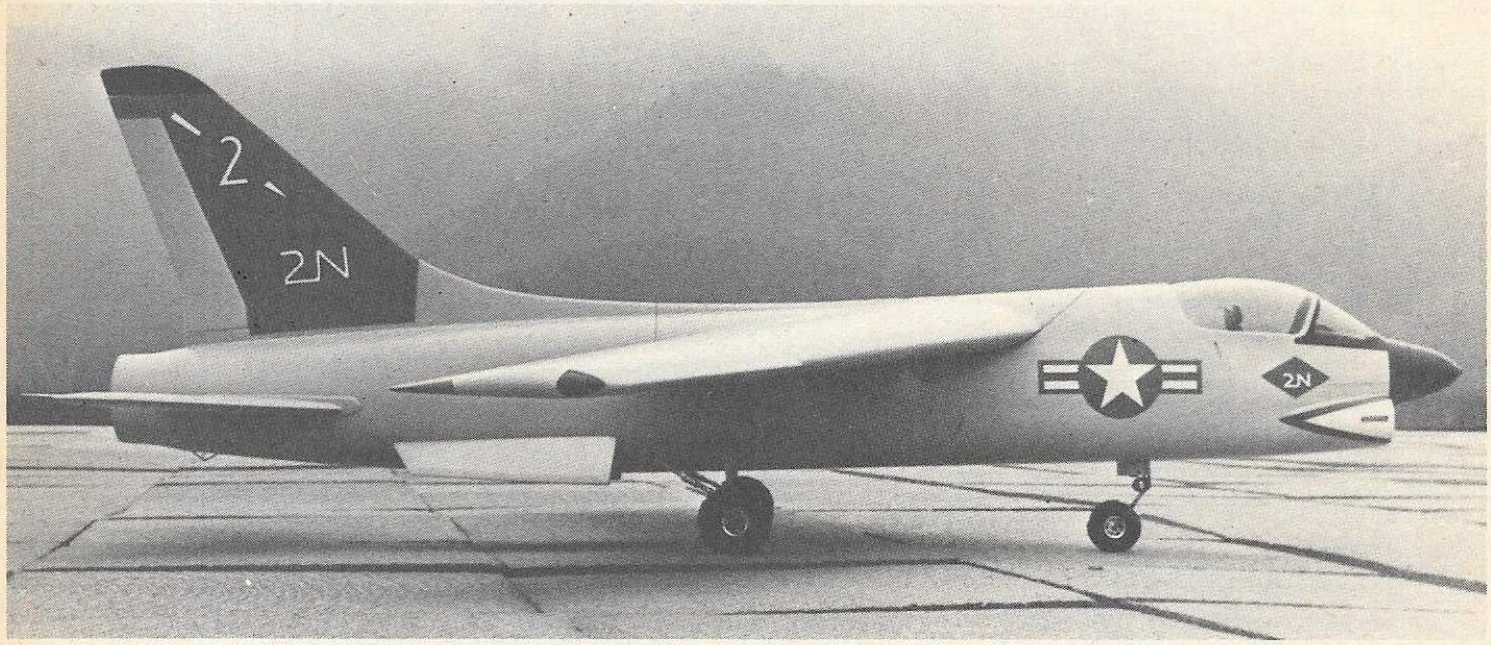
The cavernous fuselage offers room to spare. Hold tight to the C.G. requirements. It's off the ground in 75 yards. A deBolt canopy fits it.





Once the fastest in the world. The sight and roar of an F8U Crusader climbing out on afterburner burns into your memory forevermore.

Franz Meier's superb scale replica. It behaves well in the air, with all the realism demanded of scale aircraft. A thrill to fly, takes any radio.



Wing Construction

All the ribs are cut from 3/32" hard balsa, then sanded to exact shape and cemented in place. The scale wing has anhedral which is no more difficult than dihedral. Build up the wing by placing the ribs on the plan in numerical sequence. Ribs 8 and 8A mark the place where the drooped leading edge begins. After the right wing is built and planked on the top, cut and dry fit the anhedral braces. In building this wing, notice that a false leading edge is used. This permits the wing sections to be planked with ease. Continue with the left wing panel and when finished, join the two panels together. The original model used a rather unconventional method of mounting the wing, however, we highly recommend something that is available in America and that is the Nylon 1/4" wing mounting bolts offered by Williams Bros. When used properly they afford a neat and sturdy method of mounting the wing and do away with the rubber bands and dowels which are unsightly. Install the aileron controls and flap controls before the final planking, making certain they move freely and don't bind. Finally, sand the entire structure, not once but several times with successively smoother sandpaper. Final coat is silk or Super MonoKote in the Mustang Aluminum color (205).

Stabilizer

Not much can be given in the way of instructions, for building the stabilizer it is so simple. Just sand to a smooth shape before covering. Note that the stabilizer has 3° dihedral. Drill holes into the stab pieces of plywood a bit out of round. Then turn both number 2 ribs over 180° and drill through the first hold in number 1 rib, and it will establish the dihedral. The real *"Crusader"* has an all-flying stabilizer. Either way is acceptable, however the all-flying stabilizer requires less area and is more effective in that configuration.

Finish

First of all, whether you used silk and dope or Super MonoKote or any of the other methods of covering, your *"Crusader"* will only look as good as the uncovered model. Therefore, use lots of care in preparing the model for covering. Also decide upon the decor, what aircraft scheme will you try to duplicate. A good source of lettering is the Letra-Set, and recently we found another good-line of rub-on letters called Trans-artype, made in Crystal Lake, Illinois, and available in most art stores.

Radio Installation and Flying

Install the radio with the receiver and components placed so the *"Crusader"* balances at the C.G. location shown on the plans (top view of fuselage). This will require the batteries and servos to be placed more to the rear than on a normal straight wing aircraft model. There is quite a bit of room in the fuselage, so make the pushrods straight and true and eliminate any binding in the controls. Do not vary the C.G. location more than 1/8" either way. Use a limited throw in the elevators and all the travel possible in the rudder. As a further precaution, eliminate all binding in the wheels as this will cause erratic taxiing and take-offs. Set the elevator controls at neutral, make certain the engine bolts are tight and will not work loose from vibration.

The *"Crusader"* should roll about 250—300 feet (depending upon the wind) and take off without the application of "up" elevator. The *"Crusader"* will act nose heavy with the flaps set at 30°, so make sure there is sufficient "up" trim available to compensate for this characteristic. The ship will spin, but increases speed with each successive turn, so limit the turns. The flight speed is very similar to most competition models today, and so are the maneuvers. A retactable gear would make the *"Crusader"* much more impressive, and it presents a real challenge to use on this scale model. Flying Models will be happy to print good photos of your own *"Crusader"*, in flight or on the ground. Fly Safely.