



PHOTOGRAPHY: DAN REISS

Bonanza

By Dan Reiss

This Sport Scale beauty has all the charisma of its full scale counterpart. For 60s.

Aircraft recognition is an art developed to a high degree of refinement by any kid on the block interested enough in planes flying overhead to look up. It took World War II to really make a science of this. The importance of recognizing friend or foe by just the shape of the aircraft could never be overstressed considering the consequences of a mistake. Some planes were easier to distinguish than others. I'm sure more than one Hellcat was the target of friendly fire as its fast moving silhouette looked close enough to a Zero's to encourage a nervous sailor's itchy trigger finger. But how about a Corsair? That inverted gull wing was distinctive. There was no mistaking what airplane was approaching when it was a Corsair. The same goes for a P-38. You just knew whose side they were on. These latter two aircraft had unique features that distinguished them from their contemporaries and the Beech Bonanza is like them. The butterfly-like beauty of that V tail is synonymous to the Bonanza as much, if not more than any other physical characteristic of any other airplane. Just like the opening of Beethoven's Fifth stands for V, the V tail is the Bonanza and it immediately comes to mind whenever a V tail is seen on any aircraft.

There have been many renditions of the Bonanza as models in the past, but none of them were what I was looking for. If they were

semiscale, they were usually so far from reality that they were barely recognizable as being Bonanzas. On the other hand, if they were more accurately scaled, they were far more complex than I would care to handle. The V tail and huge canopy seemed to present insurmountable hurdles. After a bit of thought, I have come up with a compromise that encompasses all my needs and hopefully yours too if you're interested in this type of semi-scale model. I have tried to maintain the most distinguishable features of the Bonanza, the V tail and the cabin area, in their proper perspective and proportion to the whole airframe while taking barely noticeable liberties with other dimensions to make the model attractive and yet easy to build and fly.

Beech Aircraft has a drawing available specifically for modeler's use. It's their drawing 35-001124 and they'll gladly send it to you for the asking. I used it to design my model. Strangely enough, a planar view of the tail is not on the drawing. It showed only the vertical and horizontal projections. Not wanting to tax my brain with some high school trig and geometry that I probably have forgotten, I sent a nice letter to Beech telling them about the model I was in the process of designing and about the view they had erroneously left off the print. I received a nice letter back from one of their PR men explaining that there was no error made. Beech feels that the planar

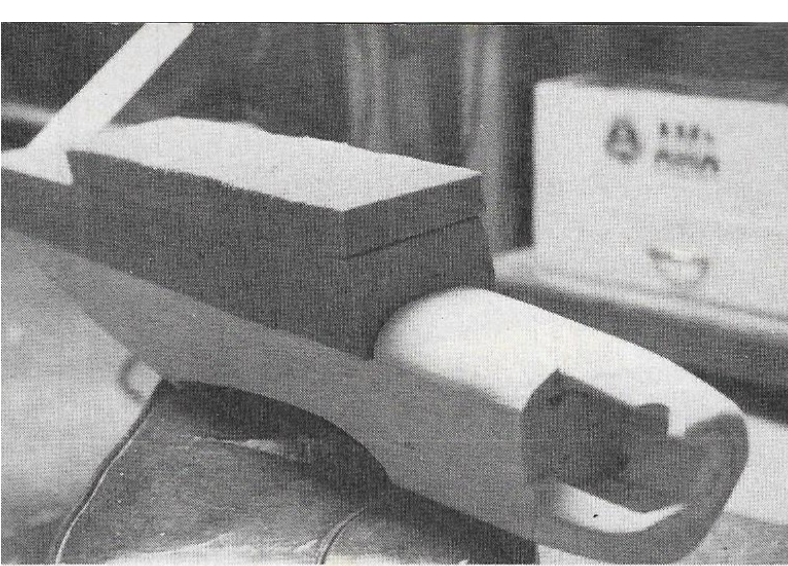
view of the V tail is proprietary information.

Since there is more than one way to skin a cat, I went down to my local airport, put my 28mm lens on my camera, got down on my back under the V tail of a Bonanza and took a picture of the planar view of the V tail. This was definitely a first for me because usually I take pictures of three views and blow them up. Now, I was taking a picture of a full sized view and reducing it.

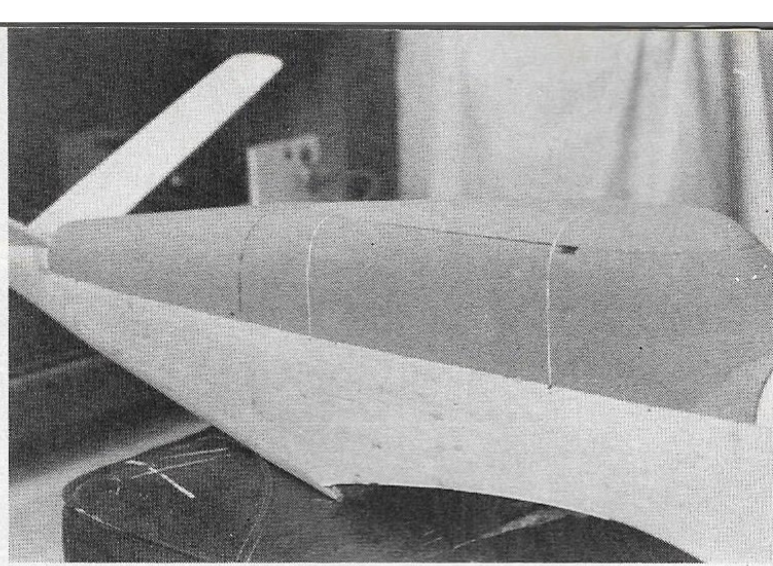
As I said before, this is a semi-scale model that's easy to build. Except for the tail and canopy, the plane assembles like any sport pattern ship.

The model wing is foam, covered by a balsa skin. The barndoor ailerons and associated linkage are rather conventional and require no discussion if you're experienced enough to build a plane like this. The only thing that's unusual are the landing gear doors. They are not attached to the landing gear but are glued to the wing. Do this after you paint the airplane. Finish the wing and doors separately.

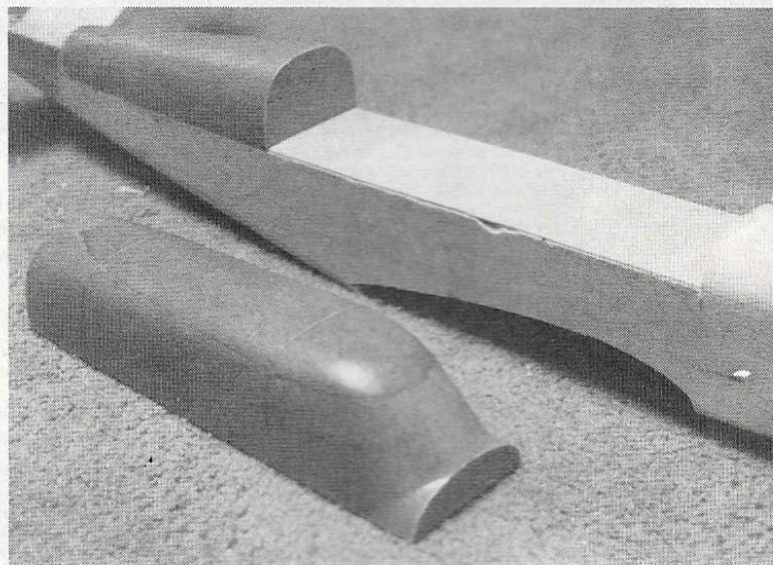
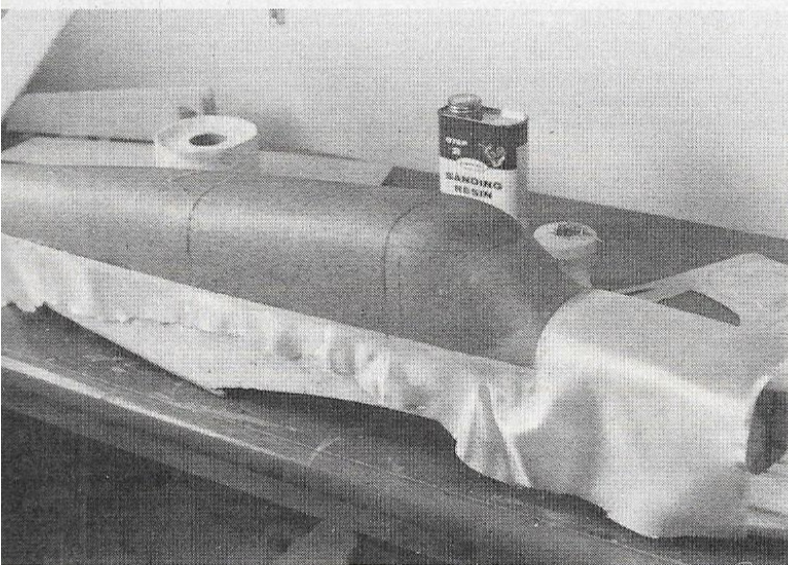
The main fuselage structure is the box formed by the full length 1/4" balsa sides and the formers. I have utilized a foam block sanded to shape and covered with four ounce cloth to obtain the contours of the canopy and top of the rear fuselage. You can keep the entire fiberglassed foam block in place and paint in the windows or you can cut off the portion around the cockpit area and vacuum form a canopy using the foam as a mold. I chose the latter since the transparent see through windows and windshield add an enormous amount of realism and attractiveness to the model. If you are going to go this route, you'll have to put one of the best finishes you've ever achieved on the foam block because the slightest imperfection shows up in the formed canopy. You'll also have to look around for someone with a sizeable vacuum forming machine. A good place to start is in your telephone book under "Vacuum Forming". The canopy is formed from .030 clear sheet. Once you have the canopy, the tough part comes next. That's getting it on to stay and making it look decent. It takes very careful use of five minute epoxy, resin, cloth, microballoons and lots of time. Just keep working on it. The results of a good job are very satisfying. My



Foam blocks are used to form mold for Bonanza's vacuum formed canopy (above). Carve and sand slowly to assure perfection. Finished mold is fiberglassed (below). Be certain finish is as smooth as possible.



Foam blocks carved and sanded (above). Canopy will be pulled from front section of cabin area. Canopy mold after final finish has been applied (below). Glass-like finish is what you want. Work carefully.



only advice is to mask off the windows as soon as the canopy is formed.

The other hard part is the V tail. Cut out both sides from $\frac{3}{8}$ " balsa sheet making sure that they are identical. Using a radial or table saw to cut the pieces accurately, make up a V shaped fixture to be used to hold the V tail halves in place as you epoxy them together. This fixture must be very accurate for obvious reasons. As you can see, I have made life easier for all of us by making the angle from the horizontal 30 degrees instead of the more accurate 33 degrees. Once the joint has cured, wrap it with fiberglass tape for added strength. Installing the V tail on to the fuselage is quite a chore. Actually, getting it on accurately is the problem. Mount the wing to the fuselage and set the plane up with zero degrees incidence in pitch and roll on the biggest and flattest surface you can find in the house. I used a glass topped coffee table for this. Using every ruler, square, string, etc., that you can get your hands on, set up the V tail on its platform with zero degrees in pitch and roll relative to the plane and table top and yaw relative to the plane. It takes quite a while to get it all straight, but it can be done. My Bonanza required only a little up trim to get it flying right. As soon as the epoxy cures, add the vertical side supports from the platform to the stabilizers. These supports should be sanded for a close fit. Epoxy them in place. This makes for a very strong structure as evi-

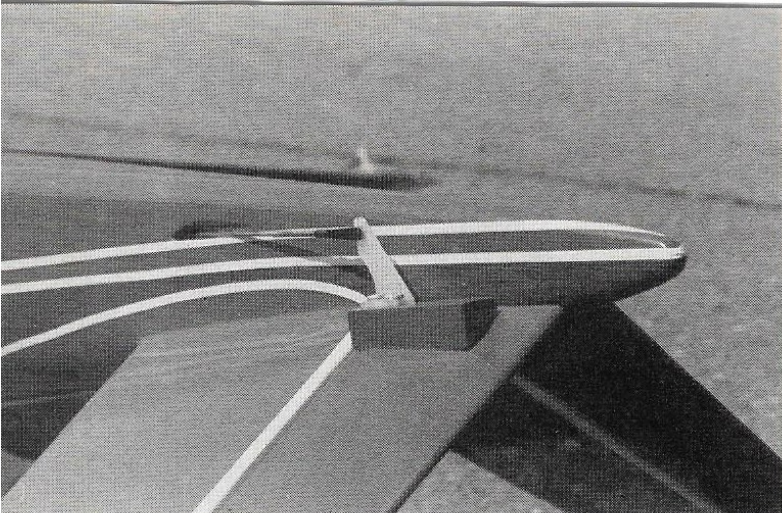
denced by the 100 or so flights I have on my plane.

Another point of interest is the control horn mount. If you mount the control horns directly to the ruddervators, they'll be sticking out at 30 degrees from the vertical. To get them parallel to the vertical, the mount will have to compliment that 30 degrees. Make up the mounts from several layers of plywood. Sand one of the surfaces off at 30 degrees and trial fit the mount. Keep redoing it until the control horn is hanging straight down. Epoxy the mount in place.

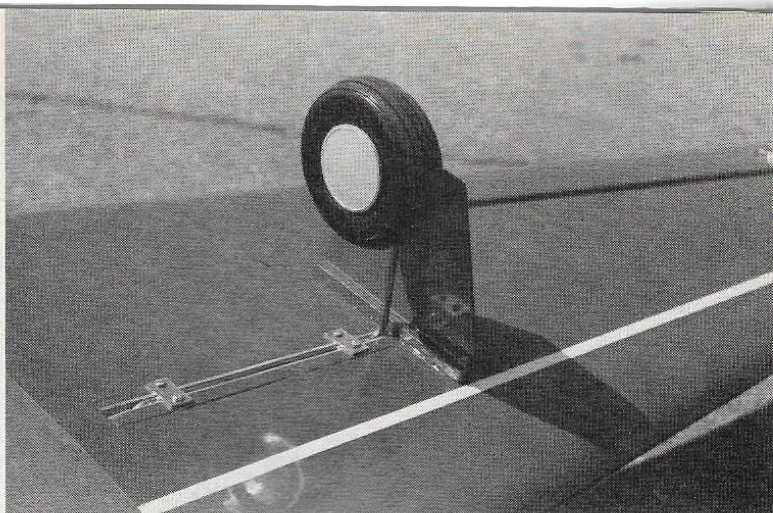
I finished my Bonanza using K&B's finishing materials. I filled the balsa with two coats of surfacing resin. After sanding this to a smooth surface, I sprayed on a coat of primer. This was followed by the color. There are probably as many different color schemes around to choose from as there are Bonanzas. As the planes got older, the factory finishes were replaced with those that suited the present owner's fancy. A trip to your airport should give you enough ideas to choose from. The color scheme that I used was that of a very patriotically painted red, white and blue Bo-



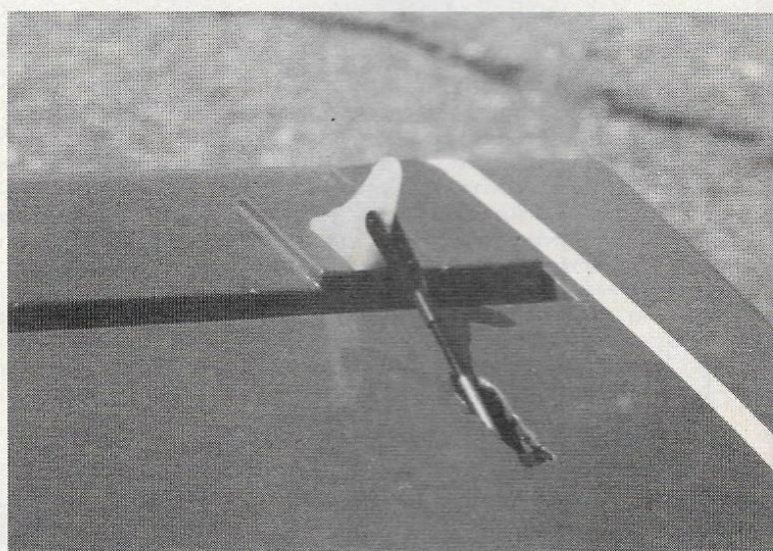
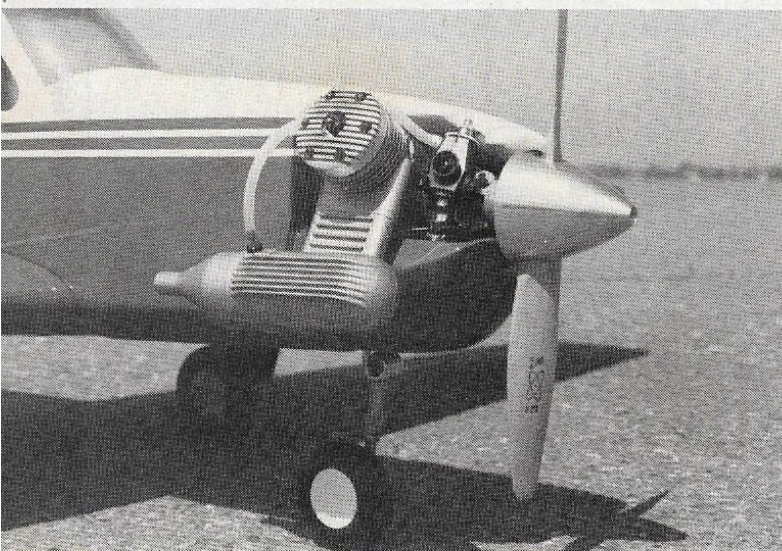
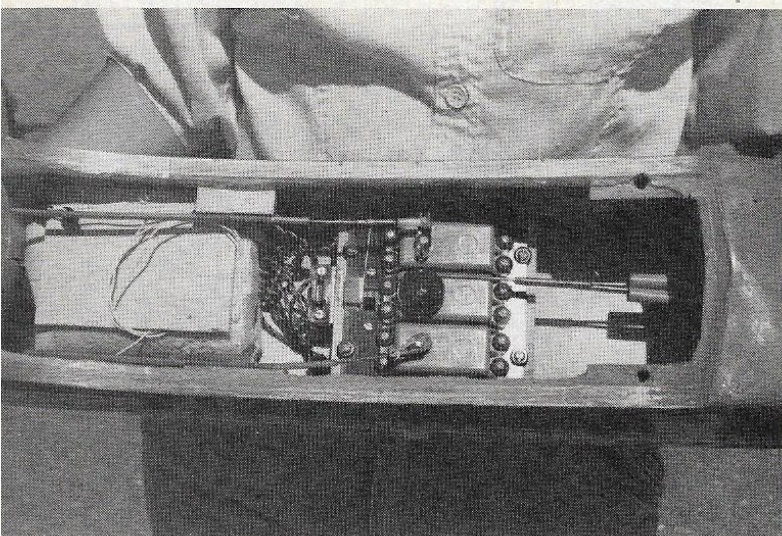
Author's Bonanza on the runway. Paint scheme is from actual plane owned by H.A. Sessions of Lubbock, Texas. Finish is K&B epoxy paint and surfacing resin. Distinctive "V" tail evident here. Pretty plane.



One of "V" tail control horns and pushrods (above). Angled block makes it simple. Radio compartment (below). Plenty of room here. Engine installation (bottom). Engine and muffler exposed. Neat work.



Wing mounted landing gear leg (above). No retracts, just fixed gear and wing mounted door. Nose wheel (below). Simple and effective. Aileron horn and pushrod (bottom). Uncomplicated hookup.



nanza that Beech used in their 1976 (I think) promotional brochure. After the photos for the brochure were taken, Beech put the plane up for sale. The plane was purchased by Mr. H.A. Sessions of Lubbock, Texas. He still owns it. Mr. Sessions was nice enough to provide me with a few photographs of his lovely plane.

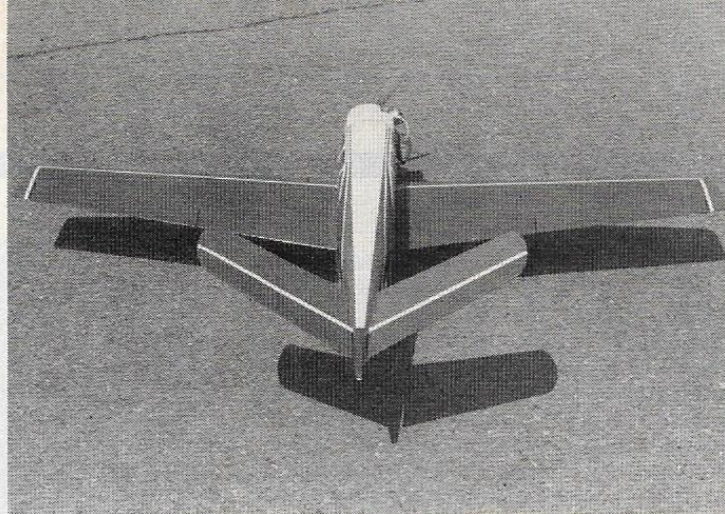
The control installation is pretty standard except for the V tail. A rudder-elevator control mixer is required to get the proper movement. This can be done either mechanically or electrically. I checked out every mechanical

mixer I could find and rejected them all. They looked OK for gliders and 1/2A's but for a 60 powered plane, no way! The control surfaces of a 60 powered 8 pound plane moving at 60 miles an hour are under extremely heavy load conditions. I contemplated a rudder servo moved on rails by the elevator servo and I vetoed that idea. As far as I can tell, the only way to go is electronic mixing. You can buy a separate airborne mixer that goes between the servos being mixed and the receiver. These are usually available locally. I would look at these very closely from the aspects of

performance and reliability. It becomes a very critical part of your radio system in this application. As far as I'm concerned, electronic mixing at the transmitter is the only way to go. Kraft will install this option in their transmitters for \$75. It may be a bit expensive but it should be worth it. You may be able to tell from the accompanying photographs that I have used none of the above. I don't have any rudder action at all. The rudder servo is used to control the nosewheel only. The elevator servo utilizes a Y shaped pushrod to the ruddervators to push and pull them simultane-



Rakish lines of the Bonanza show through from this angle. The original has a distinctive "V" tail which makes the ship instantly recognizable. This Stand Off scale model has the flair of its full sized cousin.



The single most recognizable feature of the Bonanza, its "V" tail. The complexity of hooking up the push rods and control horns has been minimized in this model. The author's Bonanza flies as good as it looks.



From this angle it's tough to tell the model from its full sized counterpart (top). The real Bonanza in flight (above). This is prototype for the author's model. Both are snappy looking planes. Build one.

ously. Admittedly, this has led to a few hairy takeoffs as the propeller torque is difficult to overcome by the nosewheel alone. Application of down elevator until flying speed is reached does help the steering, but a cross wind from the left can be hazardous. The choice is yours.

I had been reluctant to commence this project because of all the stability problems I had heard about associated with the full sized Bonanza and I assumed they would be compounded when the transition was made to a model. My apprehension continued throughout the entire time I was building the model and was only partially relieved as I carefully watched every Bonanza flying across the sky. I figured that something must be right if all those planes have been flying for all those years. It turns out that my fears were for naught. The V tail flies perfectly. My Bonanza is extremely stable, tracks very well and has exhibited absolutely no bad tendencies during its many flights.

That V tail is really a thing of beauty in the air and is a joy to behold. If you've been waiting for a Bonanza you can tackle, try mine.