

FOKKER DVII

BY CHUCK CUNNINGHAM

Designed for RCM's World War I Scramble, the quickly-built Fokker is an ideal .15 powered sport aircraft.

The .15 powered Fokker D7 has been expressly designed for the WW I Scramble event presented in the July 1973 issue of R/C Modeler Magazine. It has been designed to look like a D7 and yet is not a scale replica. The original was flown first with a Super Tigre .15 and then later with an O.S. Max .15 with the conclusion that both engines give excellent performance. Obviously, the Super Tigre has more power output but the aircraft flies just as well on the Max .15.

One of the most enjoyable features of the Fokker D7, as far as I am concerned, is that it is one of the best flying, peppiest, all-around most enjoyable little airplanes that I have ever designed or have ever flown. In fact, it literally did fly right off the drawing board. The first flight was made on a weekday evening with no one at the field. When the engine was cranked up, I reached over the top to adjust the needle valve and the first flight, as well as all subsequent flights from that point on, were really a dream. The airplane has been flown in still air and in winds up to 25 mph, the latter leaving white caps gusting on Lake Benbrook adjacent to our flying site here in Fort Worth, Texas. I feel confident that if you build the Fokker D7 for either a WW I Scramble event, or simply for sheer sport flying, you'll have one of the sweetest, nicest flying airplanes that you'll ever have the opportunity to own.

As a small aircraft there is very little material that goes into building the model and very little time consumed in constructing it. In fact, the original was built in three evenings and covered in one additional after dinner session. Everything has been designed in this aircraft to use stock sizes of wood, there is almost no waste, and the entire aircraft, when finished, should weigh between 2 3/4 and 3 pounds. My original was covered in red MonoKote while Don's prototype in California used yellow and red Solarfilm with black and white trim MonoKote.

When I designed the model I assumed that it would be able to fly with just rudder and elevator without using ailerons so, during the first flight I did not have ailerons on the lower wing. At slow speeds however, the rudder was very effective but as the speed increased, the rudder became less and less effective. In fact, it became almost impossible to make the aircraft turn when it was flat out in a racing mode so I took it back and cut 1" wide strip ailerons on the bottom wing and have flown it this way ever since. This is the way it is shown on the plans presented with this article. You will also note that the wings are fully sheeted and have just a short spar on the center to provide a little extra insurance. My original prototype does not utilize this spar, however, after seeing what this aircraft is capable of doing, and how quickly it can be put into a snap roll and then into a full speed spin, it seemed a little bit wiser to go ahead and

add a small spruce spar across the center section of both wings! The Fokker D7 will fly upright, upside down, inside out, and do anything you ask of it. It will go through any AMA maneuver which a little .15 size engine is capable of performing. I suggest that for maximum power output you use a Taipan 8/4 glass filled nylon prop available from Hobby Shack.

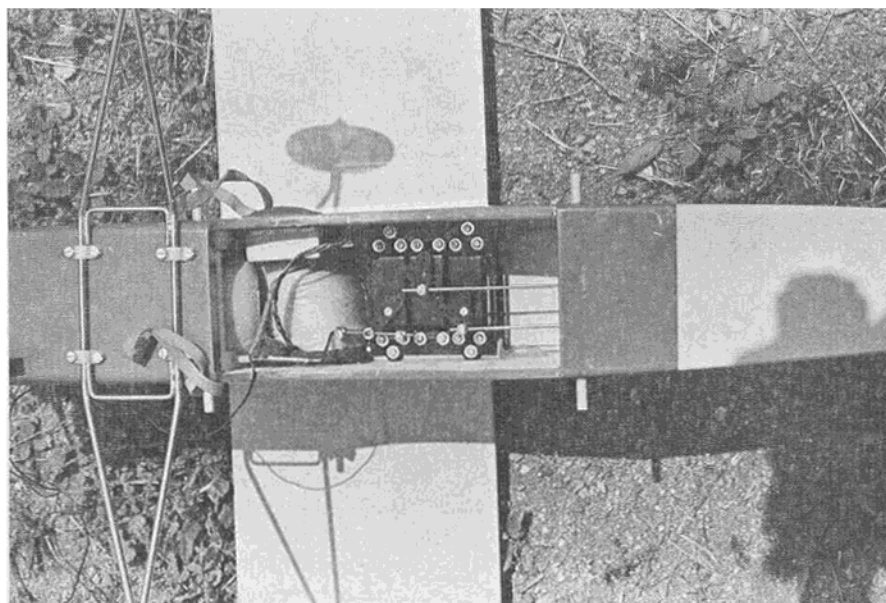
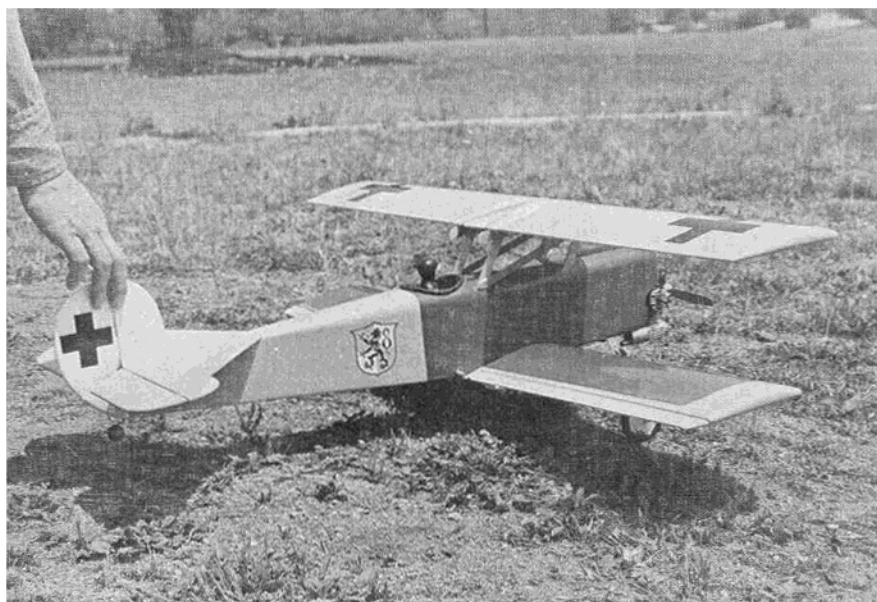
The original set up was for a Super Tigre .15 and, when the Max .15 was incorporated in the nose of the aircraft, I used a long extended .15 Tatone mount plus a 1/4" plywood block behind the motor mount between it and the firewall in order to put the .15 out into the breeze. By using all of the extra long mount it allowed the needle valve to stick out past the nose of the aircraft, however, this is not objectionable, and makes it much easier rather than putting in an extension down inside the nose cowling.

If your interest has been whetted by this description of the Fokker D7, get out your pile of balsa wood, your trusty razor blade, your tube of epoxy glue and let's get to work.

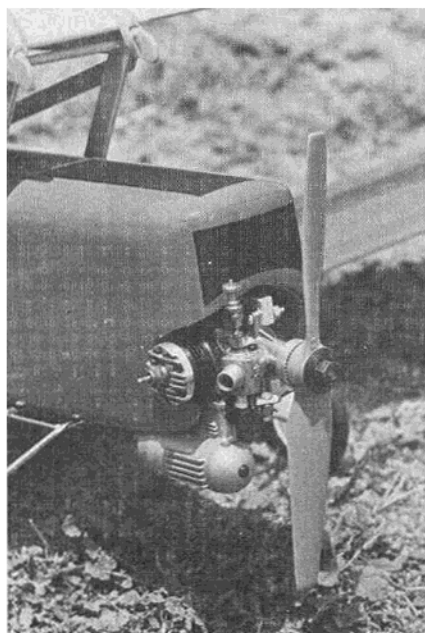
FUSELAGE:

Begin by cutting the sides to the outline as shown on the plans from the 3/16" x 4" x 36" balsa stock. Be sure that you make the sides exactly the same as this will help to insure a straight flying aircraft when you are done. With a soft nylon marking pencil, mark the inside of each fuselage side then, using a small square, mark the lines on the inside of each fuselage side where the formers are to be glued in place. Cut out the formers and mark a center line down the middle of each former. Put a piece of wax paper on the plan and pin the formers upside down over their location on the plans. Simply pin former B and former C in place. Now, using 5 minute epoxy, fit each side against the formers, making sure they're located properly and glue the formers where the lines are marked on the inside of the fuselage sides.

When this is dry, glue in the firewall former A, making sure you put in both the side thrust and down thrust as shown on the plans. Remember you're building the fuselage upside down so that when you're building the side thrust into the firewall, it will be reversed from that direction as shown on the top view of the drawing. When the firewall is dry, bring the tail section together and glue this with epoxy, making sure that everything is lined up. Be certain that the marks on the center line of each former line up exactly with the junction of the two side pieces at the tail since this will insure a perfectly straight fuselage. When all this is dry, remove from your building board, install the extra 3/16" side pieces at the nose, the soft block at the bottom of the nose cowling, and then glue on the 1/2" soft block to the top of the fuselage.



RCM's prototype of Chuck Cunningham's Fokker DVII. 36" span, O.S. Max .15 power. Capable of most maneuvers, it is an ideal sport aircraft for the sport flier who has passed the intermediate trainer stage. Photos show MRC Masters Series VIII radio installation as well as method of hanging the Max .15 out in the breeze.



Now, sand the fuselage to shape and bevel the aft section of the top block from the cockpit back to the junction of the elevator. The fuselage should bevel to just $3/16$ of an inch deep at this section where the elevator rests. Round the nose of the aircraft to give the sounding line as shown on the side view. If you would look at a Profile Publication's picture, or any picture of the Fokker D7, you will see that the nose is rounded, while the sides are flat. When you have everything sanded, cut out your cockpit section and glue a floor in place in the cockpit area. On the original I did not cut out a cockpit, I simply made a circular section of black contact paper and stuck it in place on the fuselage top once the fuselage was covered. Subsequent models that have been constructed have a full cockpit section in them, but I was in a hurry on the prototype and therefore took the simple way out.

While everything is being worked out on the fuselage glue the pieces together to form the rudder, the vertical stabilizer, the horizontal stabilizer and the elevators. These can all be glued and drying while you're putting the fuselage together. Do not attach the elevator or horizontal stabilizer or the vertical stabilizer to the fuselage, until after they have been covered. This is a much easier way to complete your aircraft and facilitate quick construction.

The next thing to build in the fuselage section are the cabane struts. These were all made very simply out of $1/8$ " plywood as shown on the drawing. Make sure you make one right and one left cabane section. Note that the diagonal piece is glued on the outside as well. When the two cabane struts are completed (and I suggest that you build one on top of the other so they both line up completely) set them up and drill a $3/16$ " hole for the $3/16$ " dowel that's shown. This dowel will tie the entire cabane section together. Next, on the fuselage, cut four notches on the top block where the cabane struts will slip through. Then mark a horizontal line on the outside of each vertical cabane to indicate the top of each fuselage side. This then will let you line up the cabane struts so that you have no incidence in the top wing. Slip the cabane down inside the notches cut in the top of the fuselage until the lines cut on the cabane struts are exactly level, then you can glue them inside with epoxy



glue. Again, do not install the cabane struts until the fuselage has been entirely covered and is entirely finished.

WINGS:

The wings are very simple to build, and can both be built simultaneously if you have a drawing board or working board that has any size to it at all. Glue all of the sheets of balsa together, two pieces 3" x 1/16" x 36" for the top of each wing and two pieces the same size for the bottom of each wing, making a total of 8 sheets. Cut out all of the ribs required for the top and bottom wings and remember that, on the bottom wings, you are using two 3/16" ribs in the center section. Stack all of the ribs together and sand them so that they are all the same contour section. Cut the notches in the center bay ribs for the single spar to be used in each wing. Now, take two pieces of 3" x 1/16" x 36" material that you have glued together and pin them down flat on the drawing board, forming the bottom of the wing. Make the leading edge piece from a piece of 5/16" or 3/8" square balsa plus a 1/16" x 1/4" balsa glued to the back side of the leading edge. When this is dry, glue it on top of the leading edge and pin in place and, if you are making the lower wing, pin the trailing edge 1/4" square piece in place. Next, glue each rib in location, remembering that they are 3" on center. Before you glue the ribs in place, put the 18" long spar in place followed by the ribs. Next, take the top sheeting, glue it, and wrap it over and pin it down well so that when it dries it will be entirely covered.

Next, build the top wing in the same manner except that you do not use the 1/4" square trailing edge piece. Let the two pieces of 1/16" sheet come together at the back to make the trailing edge of the wing. When both wings are dry remove them from your building board. Take the top wing and glue the tip blocks to it. Cut the bottom wing using a sharp razor blade, then block up each half 3/4" and sand a

bevel into the center rib of each wing tip. Next, glue the center section together on the bottom wing, blocking it up 3/4" under each wing tip. Use epoxy glue again for this. When this is dry wrap the center section of both the top wing and bottom wing with a 3" wide band of fiberglass or Silastic. This is done more as a protection from rubber bands than as a strength factor, however, in the case of the bottom wing this is the only thing that is needed to hold the two wing sections together. A 1/16" plywood dihedral brace is added to the bottom wing only if you plan to bolt the wing in place and if you plan to drill a hole through there for the wing hold-down dowel. When every thing is dry, sand the wings to shape and set them aside for covering.

TAIL SURFACES:

The tail surfaces are made of 3/16" soft balsa sheet and are very simple to put together. When they are glued and dry, sand them to shape. Use a soft piece of coat hanger wire to make the U shaped connector between the two elevators.

LANDING GEAR:

When I first built the aircraft I used a landing gear made up of 1/8" wire as shown on the plans, however, in browsing through one of the local hobby shops, I came across the very fine landing gear distributed by World Engines, called an I.M. Products landing gear. The original landing gear was replaced by the I.M. landing gear and I think that if you can obtain this commercial unit you will be very happy with it. The tail wheel is not scale, obviously, but makes for much better ground handling as well as the fact that you don't have to listen to the horrible scraping sound of a wild tail gear going across pavement!

COVERING:

The entire aircraft was covered with MonoKote. The vertical tail section was covered in white while the remainder of the aircraft was covered in red. A Sealectric sealing iron was used to seal all the edges and a Polytherm heat gun was used to shrink the MonoKote in place. This makes for a very simple and beautiful covering and is really the quickest way to finish off a small airplane like this.

RADIO GEAR:

The original aircraft used an EK Products Champion radio with small servos since these fit very nicely into the aircraft and leave lots of room inside. Don's prototype used the new

MRC propo system. You can use Golden 'N Rod type pushrods or balsa and wire type pushrods at your option. Other items used were EK hinges, Williams Bros. 10 1/2" scale wheels, and a 4 oz. Sullivan tank. There's plenty of room in the nose for this tank as well as plenty of room for the battery. Be sure to balance your aircraft where shown on the drawing. If you need a little additional nose weight you can use soft lead plumbers wool stuffed up ahead of the battery pack. However, if you keep all of your radio equipment fairly well forward you shouldn't have to add any additional weight to the nose.

You may either bolt the wings in place or use rubber bands as I did on the original. I am thinking about going back and modifying the original to take bolted application of the wings, but I haven't done so as yet. The only reason for so doing is it would make a much neater looking airplane.

FLYING:

When your aircraft is complete, pick a day when there is not very much wind blowing. Even though I have tested to my own satisfaction that the D7 can handle a very large amount of wind it's much easier on your nerves if you pick a nice calm day in which to make your test flights. Be sure that both wings have no incidence in them since they should be at 0-0. The engine should have at least 2 degrees down and right thrust. The aircraft will track very nicely on its wide landing gear, and has no desire to tip over on its nose nor is it the least bit prone to ground loop. Start your engine and taxi out to the take-off, advance your throttle, and let the aircraft track out across the runway and then slowly lift it into the air. I think you're in for one of the best times that you'll ever have flying a small airplane.

Good luck and good flying. □

**From
RCModeler
Sep. 1973**