de Havilland Comet

FOR RADIO CONTROL

World-famous DH-88, winned in 1934 of the England-to-Australia race, makes sleek, fine-flying project with two 19's.

SKIP WILLIAMS

WHEN I was flying, I was one of those who said: "A scale model doesn't fly well enough to be worth building." In R/C, this is still true. In some cases the real problem is that no one really knows if it will fly, or not until one has been built and tried. I always want something different and original, so I have a problem. The big decision must be: what plane will I build? From experience in flying competition scale and pattern, I have listed the requirements for a good contest scale plane.

The plane must be simple and sturdy in construction. It must fly well, and it must be able to take advantage of the maximum scale operations which are available for that particular craft. Needing something to start with, what could be better than the January color centerspread from AAM?

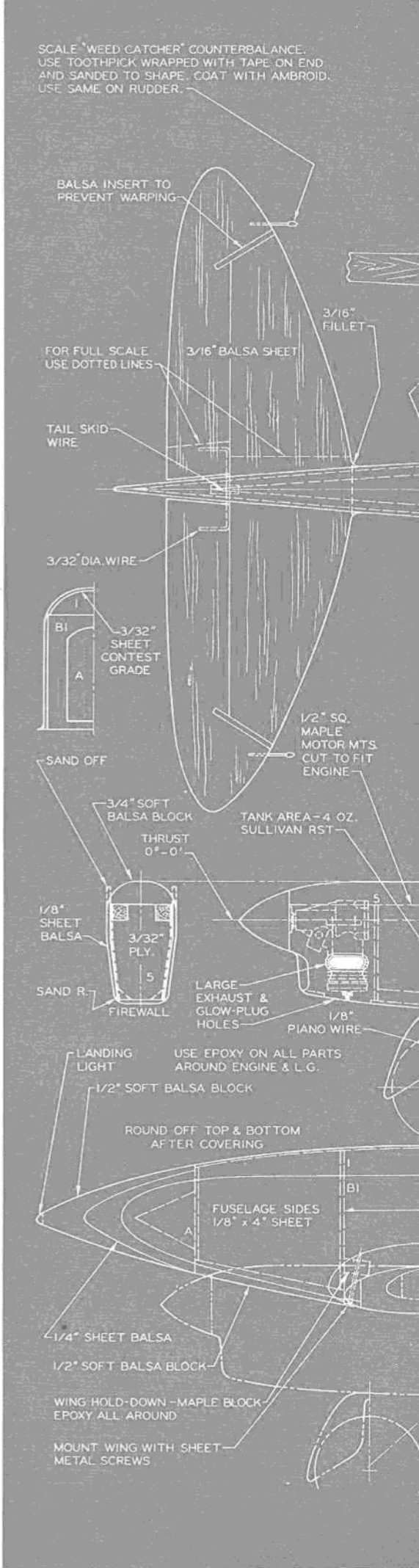
I had in mind a small twin-engine plane for some time and, before I saw the Comet, I had considered the World War II Messerschmitt 110. After seeing the sleek lines of the de Havilland and the possibilities of cowling in the engines, along with good-sized tail surfaces for stability, there was no doubt this ship met my requirements.

Now that a selection had been made on what to build, what about size? The proper scale has to be figured to give the right size plane for power; that is, square inches of area vs. expected weight. I always feel sorry for the poor guy who puts in so much work and time on a beautiful plane that doesn't have enough lift to get off the ground. He has eliminated himself from competition at the start. With this lesson as a guide, let's do some figuring.

I believe a 1.5" scale is right because the dimensions seem to be right for two 20-size engines, with enough area to carry the weight required for toughness in rough landings; so for scale competition we must keep the craft as close to true scale as possible. However, the AMA rules do allow you to cheat a little to enable the plane to fly. So this is what we must do. The rudder is large enough, just as it is, but the stabilizer is a little short, so we add about 20% to its span and it still looks scale.

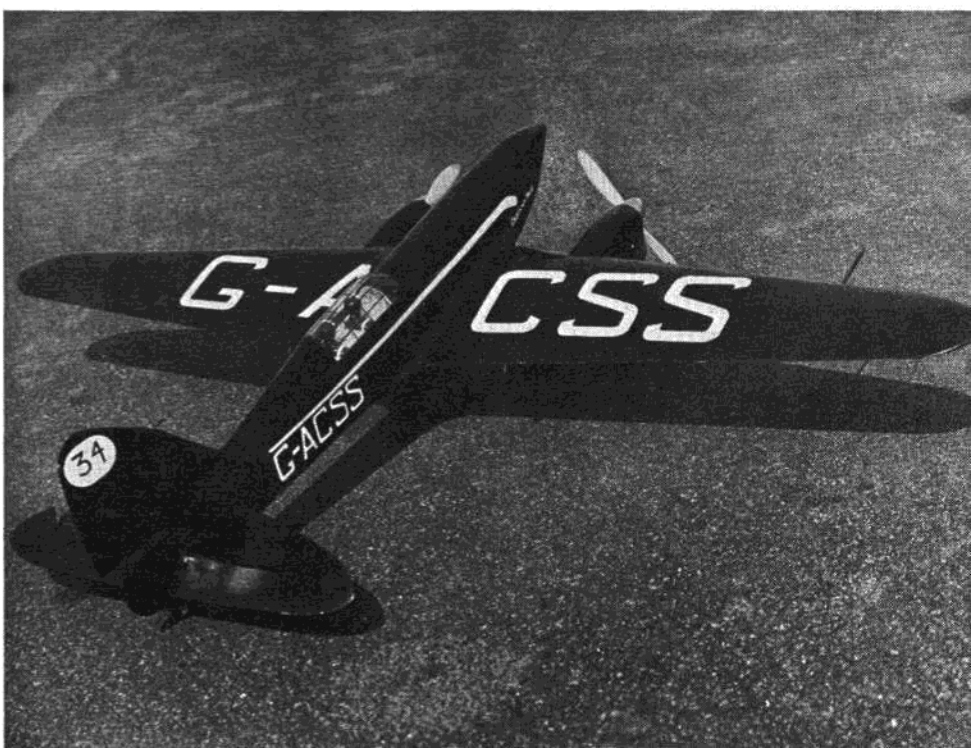
The dihedral is good as it is, but the airfoil is too thin — especially at the tips. You pattern boys know what a bad thing a tip stall can be on a slow landing. In order to improve this condition, which one can anticipate even before building, we can thicken the wing, more so at the tip. I found this change valuable. Even so, you have to land the ship fast with the tail up to prevent tip stalling. I am sure this is the way the original also was landed. The only other change is to make room for a fuel tank and engine in each nacelle and still have room for the landing gear. I added about an inch to the nose of each nacelle, but some of your engineers may find a solution that permits accurate scale.

Construction is similar to many other models, except that we are building the equivalent of three fuselages, counting the engine nacelles. In small pattern planes I have been using $\frac{3}{32}$" to $\frac{1}{8}$" sheet balsa sides, laminated



with 1/32" plywood for strength, from the engine to behind the trailing edge. I have crashed planes very hard, and not had a crack in this section. Since this is good, light and strong construction, it is used on the nacelles as well as the fuselage.

The wing is cut from foam, covered with 1/64" birch plywood. I had bought a couple of sheets of this plywood and it cost so much I kept it until I had something special enough to use it on. It is strong but I think balsa sheet covering would be just as good. A top and bottom 1/4"-sq. spruce spar is used out as far as the engines and a balsa spar can be added out to the tip, on top or bottom, but may not be necessary. If you build up the wing, I recommend covering it with sheet balsa. Make your wing as strong as possible without increasing the weight too much. If a weak wing breaks, you have lost two-thirds of the plane. But, again let me emphasize the importance of light weight. My model weighs one ounce less than 4 lbs., without radio equipment. I was trying for no more than 6 lbs., and wound up after final finishing with a little less than 5½ lbs. gross.



Beautiful to look at on the ground or in the air, author's DH-88 is bright red with white trim. See January 1969 centerspread.

The finish used was du Pont Acrylic Lacquer over a good hard base of clear dope. If the dope is not used as a base, the finish will crack. By the way, go easy on the primer; it can add weight quickly. I sanded the primer down to the clear dope leaving only the pores full of primer, and then sprayed a very thin coat of color dope all over to give good cover. The color that most closely duplicates the bright red of the real plane is Apple Red. A very thin second coat was sprayed on very wet to give it a natural shine.

The markings were made from white vinyl sheet which has a contact adhesive on the back. You could use MonoKote or paint on the markings if you wish. Just before judging, a little spray-can lemon wax and a soft rag will bring out the shine. I got one of my buddies who runs a plastic model plant to vacuum-form the canopy. For this a solid mold of white pine (or other grainless wood) was made and the clear butyrate sheet pulled over it. To glue on the canopy I mixed some acetone with Ambroid, and painted this cement over the edge with a thin brush. This not only glues the canopy down, but bonds the plastic with the finish.

Left: Normally, a highly tapered wing spells trouble, but clever modifications not apparent to the eye, make this model safe flyer.

After checking the CG location, the radio equipment is installed. It just happened that my plane balanced perfectly before the radio was installed, so all I did was to group everything at the CG. With two servos in the fuselage, and two in the wing, you have the basic, essential controls. For retractable gear, another servo probably should be added to the wing. The flaps, which are really air brakes, can be worked off the throttle, since they will not be used on takeoff. All of this, of course, should be explained in your write-up for judging and the judges reminded as you fly, so you will not get points knocked off for not following standard flap procedure. I did not use retractable gear or flaps, mainly because I didn't have time before the contest season to devise all of the details. You guys may have your own ideas.

When you test fly this bird, you won't have much trouble talking the boys into letting you have the air to yourself, so you can listen to the engines and be prepared for anything. It is very important to check out the plane on the ground, and have both engines idle well and slow. When you pour on the power, both engines should jump at the same time. When they do you are in for a shock! I do not recommend new engines. Use engines that you have flown and are familiar with. I had a lot of running time on both my engines before flying my Comet, but still had problems at times because one had slightly less running time than the other. Another warning! Do not try to synchronize the top rpm's on the ground! Peak each engine separately, and fly that way until you are fully familiar with their characteristics.

Now it is time for one engine-out procedure training. Don't let a commercial pilot tell you how to do it because neither you nor he will be up there when one engine acts up. Even if the engine doesn't quit, the

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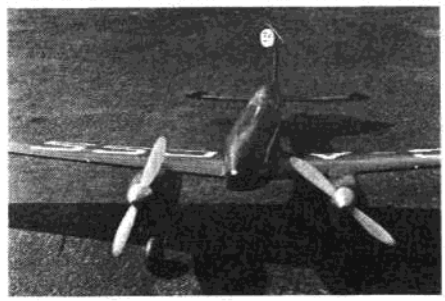
first response always is to cut back the throttle to get the plane into a straight glide headed for the field, and then to jog the throttle to see which engine is giving the trouble. When you have figured this out, trim your rudder accordingly and add throttle little by little until you see that you can stay airborne. Please don't horse around, trying to fly on one engine. Land and fix the problem!

The plane may handle well on one engine



in straight flight but make all turns gradual and flat. If you bank too sharply or slow down too much in a turn, you may drop off in a spin. This is not a bad feature of the model. It is true of any twin-engine craft. It is good practice to fly when no other planes are up so you can listen to your engines. When you don't have to worry about an engine failure, fly with the crowd — and good luck!

Remember when landing this monster, "Hightail it!"