

Three-foot span, three pounds . . . and 75 m.p.h. with a .15! Definitely not for the beginner, the Under Dawg was specifically designed by RCM as an experimental pattern ship for the new, small digital systems that will make their debut this year.

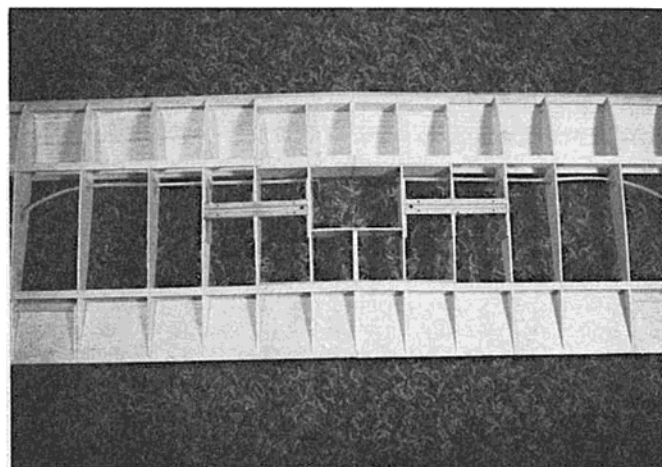
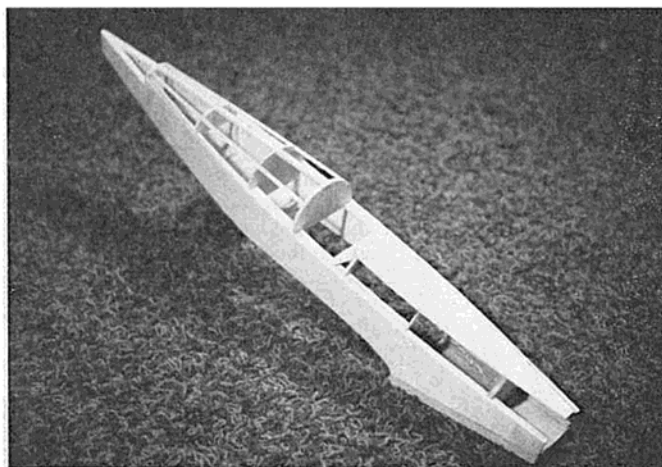
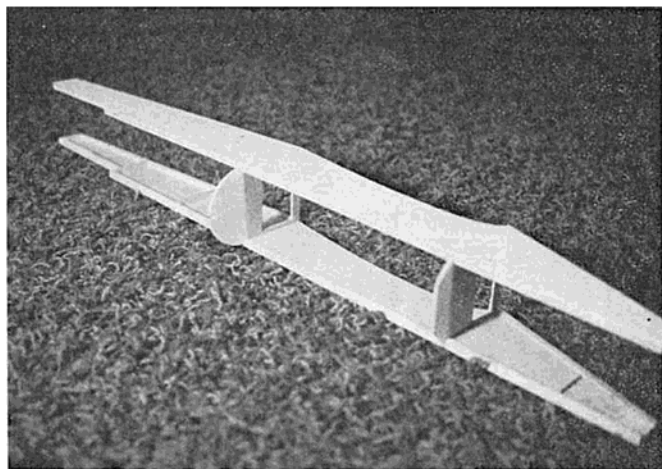
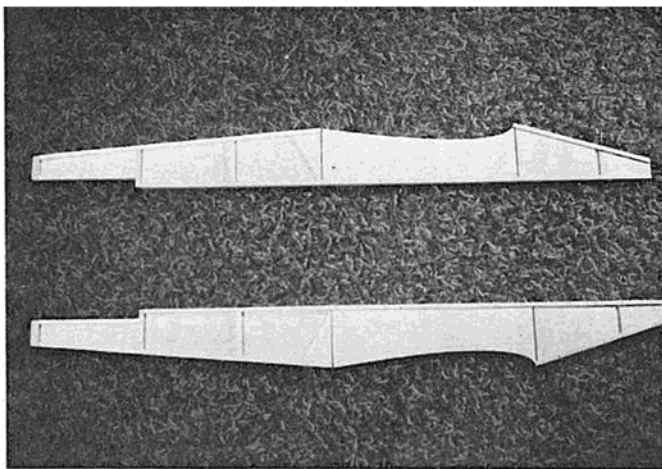


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UNDER DAWG



The Under Dawg was designed by a committee. Now a committee has been defined as "a group of people who, when no one can decide what to do, gets together and decides nothing can be done." But, this committee was different. They never got together. So something was done.

Let me tell you about it.

Shortly after the Top Dawg came out, I received a phone call from Fearless Leader (Dauntless Dewey—you know—"Dauntless do it that way—do it this way!")

"Hey, I really like that Top Dawg, especially the size and wing planform. But lemme' tell you what I've done. I was doodling with it and sketched in a low wing—then I moved the gear back and added a nose wheel—now it looks like a real sporty contest job. Y'oughta see it!"

Slightly miffed—not seriously, you understand, because whenever you argue with the boss you wind up six inches tall—since the Top Dawg is one of my favorite designs, I said "Sounds interesting—you gonna' build it?"

"I'd love to, but what with paste-ups (that's editorial talk) and printer's deadlines, I won't be able to get to it. How about you?"

Like I said, you don't argue with the boss. "Send me the sketches and I'll see what I can do—it may be a little while."

"Oh, that's OK. Next month will be

fine!" Uh-huh!

Next day the sketches came—air mail special delivery! Boy, when some guys turn on, they really turn ON! So I opened the envelope, spread out the drawing, and after a quick once over, I grudgingly admitted "Hmmm. Not bad—not bad at all. In fact, it looks pretty good. Oh, come on now, Willard, why don't you admit it? It looks great!"

So I admitted it.

That night Bob Andris, a fellow R/C'er and aerodynamic engineer by profession, stopped by to talk about an idea he had (I wonder now what it was?) and I showed him the Dewey-eyed sketches. He took one look at them and said "Boy! That I've gotta build!"

"OK, you're on. And while you're building it, how about taking some construction shots and making up a set of plans?"

"Sure—uh, do you think Don would mind if I made a couple of small changes?"

Oh-oh, I thought to myself. Here it comes. He'll want to shorten the nose, lengthen the tail, taper the wing, widen the fuselage, narrow down the fin, move the landing gear forward, eliminate the nose gear, etc., etc., etc. And how in the devil would I explain that?

"Well, uh," I uh-h-ed. "What did you have in mind?"

"I'd like to cut the thickness ratio of the wing down to 15%."

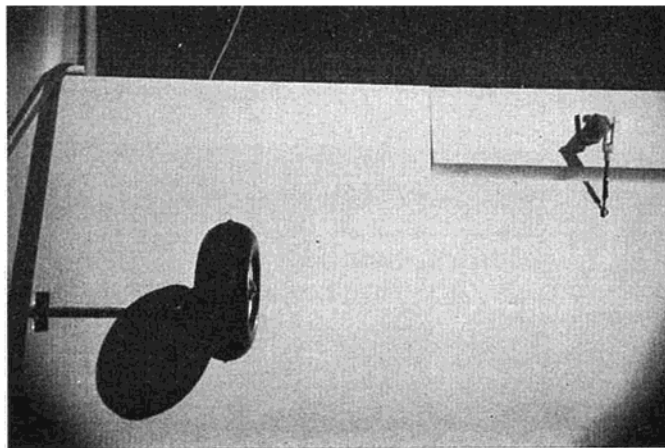
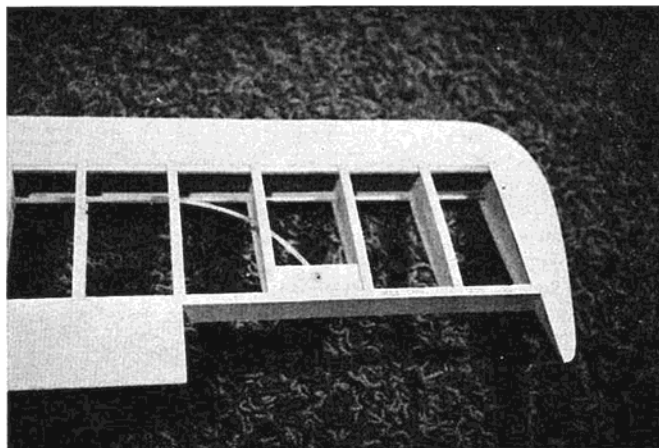
Whew! Quickly I agreed—and the project was under way.

As for the name—well, if you have an airplane with the wing on top, called the Top Dawg, and you put the wing underneath in a design variation, what else? It's the Under Dawg!

It wasn't long before the prototype was finished and ready for covering. We used the new Super MonoKote, which is still under development. Although it's really ready now, in small quantities, the big problem is maintaining consistency in a big production run. It won't be long before it's available in quantity, and I think you'll like it. Also, the present "wet" MonoKote works very well for trim patterns over the new material.

Test flights on the prototype were exciting, and I want to hasten to stress two things. First, I've always said that if a design can't be flown with rudder only, or rudder and elevator, I'd warn you. OK—take heed! The Under Dawg has to have full house control. It only wallows when you apply rudder. But, with the ailerons the turns are excellent, and the roll rate is extremely rapid, but solid.

Second, be warned that this airplane is definitely **not** for a beginner. At three pounds, with the Max .15 and semisymmetrical three foot wing, the Under Dawg has been timed at 70-75 mph in quiet air in level flight, so it gets up around 85-90 in



some diving maneuvers. It moves!

Spins, with power, are hard to believe. The airplane really winds up, but the nose stays down, with no tendency to go into a flat spin, and when the controls are neutralized the spin stops almost instantly.

The airplane will do the full stunt pattern, although tail slides are tough because of the low aspect ration, permitting a fall-off if you're not perfectly lined up.

Take-offs are great. On landing, it's best to keep a little excess speed for a good flare—if you come in nose high the sink rate is pretty rapid, and there isn't much flare left! The gear is pretty rugged, though, and can take quite a beating. In fact, it has!

After the test flights, as luck would have it, Bob had a trip to Los Angeles lined up, so we arranged for a side visit to R.C.M., and he took the Under Dawg to show it, along with a set of the plans, to the one man Top Dawg Modification Board. Well—there went the plans, and Under Dawg No. 2 was under way.

Next day I get a phone call from the T. D. D. M. B.

"This job really goes together fast, compared to a big contest airplane. I've got the fuselage about done already. Incidentally, Bill O'Brien has been making construction notes on the one he's building. Want to use them?"

I have to admit that the "glue this to that, then sand" part of design articles is less interesting to write about than the conceptual and testing aspects, but that it is very important to the readers. So, I quickly accepted the offer, and here are the construction notes.

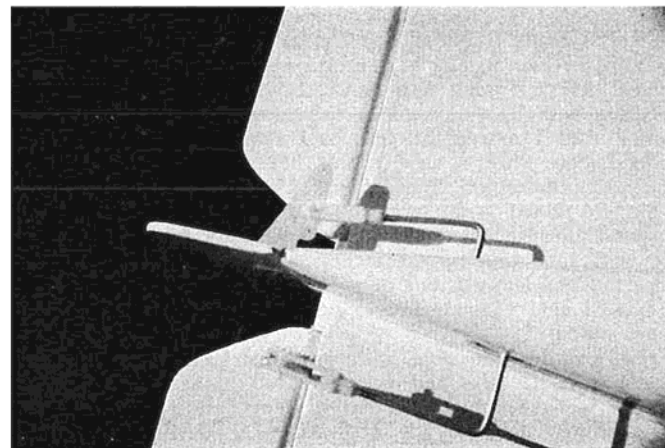
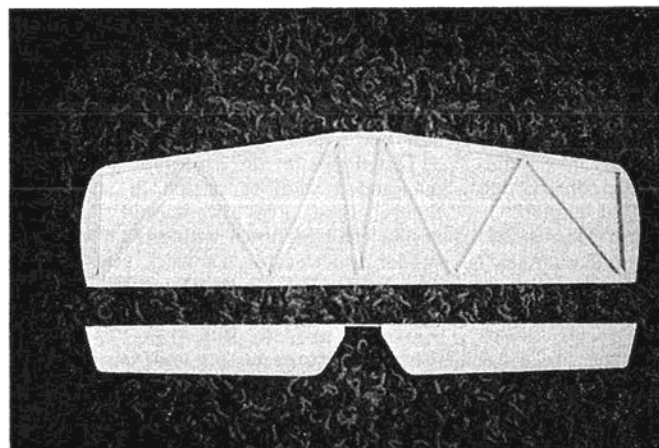
CONSTRUCTION

Fuselage:

- 1) Cut sides from $\frac{3}{32}$ " sheet.
- 2) Add $\frac{3}{16}$ " x $\frac{3}{16}$ " longerons and uprights.
- 3) Add $\frac{3}{32}$ " sheet (grain vertical) doublers with epoxy or contact cement. Leave accurate slots for formers.
- 4) Add $\frac{3}{16}$ " sheet tail filler blocks to each side.
- 5) Add $\frac{3}{16}$ " x $\frac{3}{16}$ " square servo mount rails between F3 and F7.

- 6) Cut out $\frac{3}{32}$ " ply bulkheads F3 and F7. Cut F2 from $\frac{1}{4}$ " plywood.
- 7) Cut bulkheads F4 and F5 from $\frac{1}{8}$ " balsa, and F6, F8, and F9 from $\frac{3}{16}$ " balsa. Note direction of grain.
- 8) Check bulkheads F3 and F7 to make certain they are perfectly true and of identical width. Lay one fuselage side down flat on the work table and glue F3 and F7 in their respective slots between doublers. Check with draftsman's right angle to be certain they are perpendicular to fuselage side.
- 9) Join sides, making sure of equal bends at nose and tail. Check alignment, adding F2, F4, F5, F8, and F9.
- 10) Drill engine mount holes and fuel line holes in F2. Check fit.
- 11) Add F1 and $\frac{1}{2}$ " sheet bottom nose block. Drill for nose wheel and steering cable. Rough shape.
- 12) Drill motor mount for engine. Install on F2 with blind nuts. Check fit of F1. Remove engine from mount. Remove nose wheel leg.

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- 13) Install tank and sheet nose top from F4 to F1 with $\frac{1}{8}$ " sheet.
- 14) Install stringers for turtle deck. Sheet with $\frac{1}{16}$ " balsa.
- 15) Shape and sand.
- 16) Construct stab and elevators.
- 17) Construct fin and rudder.
- 18) Glue fin to stab.
- 19) Install filler blocks to fair empennage into fuselage and glue assembly to fuselage, checking alignment and decalage carefully.
- 20) Install pushrods for trial fit before sheeting bottom rear of fuselage (if using Nyrods they must be installed before sheeting.)

Wing:

Note: The original prototype used a built up wing as described in these notes. The second prototype used a foam wing from Foamcrafts, P. O. Box 336, Campbell, Calif. 95008, with performed leading edge, aileron cutouts already made, etc. This is available from Foamcrafts, and if you use this type of wing, follow their construction methods. The following steps are for the built-up version only.

- 1) Cut 19 ribs from $\frac{1}{16}$ " balsa.
- 2) If using Jig, check rib spacing carefully, since the first four bays on each side are $1\frac{1}{2}$ " while the rest are $2\frac{1}{4}$ ".
- 3) If not using jig, block up the leading and trailing edges of ribs, with bottom spar in place, over plan.
- 4) Install leading edge (D1) and top spar; trailing edge sheeting; leading edge sheeting; and cap strips.
- 5) When dry, remove from plan, turn wing over, then install sheeting and cap stripping.
- 6) Repeat for other panel
- 7) Join panels with D1, D2, and D3, checking alignment and dihedral angle.
- 8) Cut out ailerons from very soft balsa. Cut ailerons from very soft ron cores, then sheet both sides with $\frac{1}{16}$ " balsa.
- 9) Cut ribs and sheeting away from ailerons.
- 10) Install linkage and servo mount.
- 11) Carve tips from soft balsa and hollow out.
- 12) Cover and finish to suit. Note: This is a small aircraft with a small amount of wing area. Weight is critical, so try to hold finished weight to three pounds. Performance is astonishing if the proper wing loading, decalage, and trim arrangements are maintained.

There's an old saying — "Everybody likes an underdog."

I think you'll find it applies to this Under Dawg, too!