

SHADOW

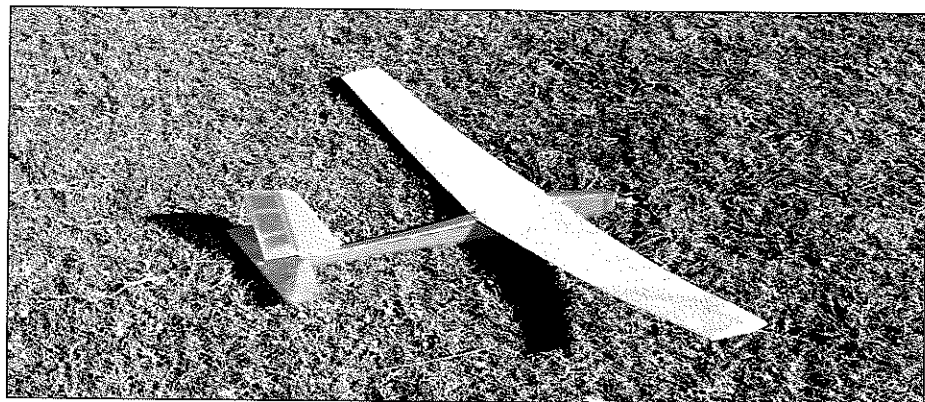
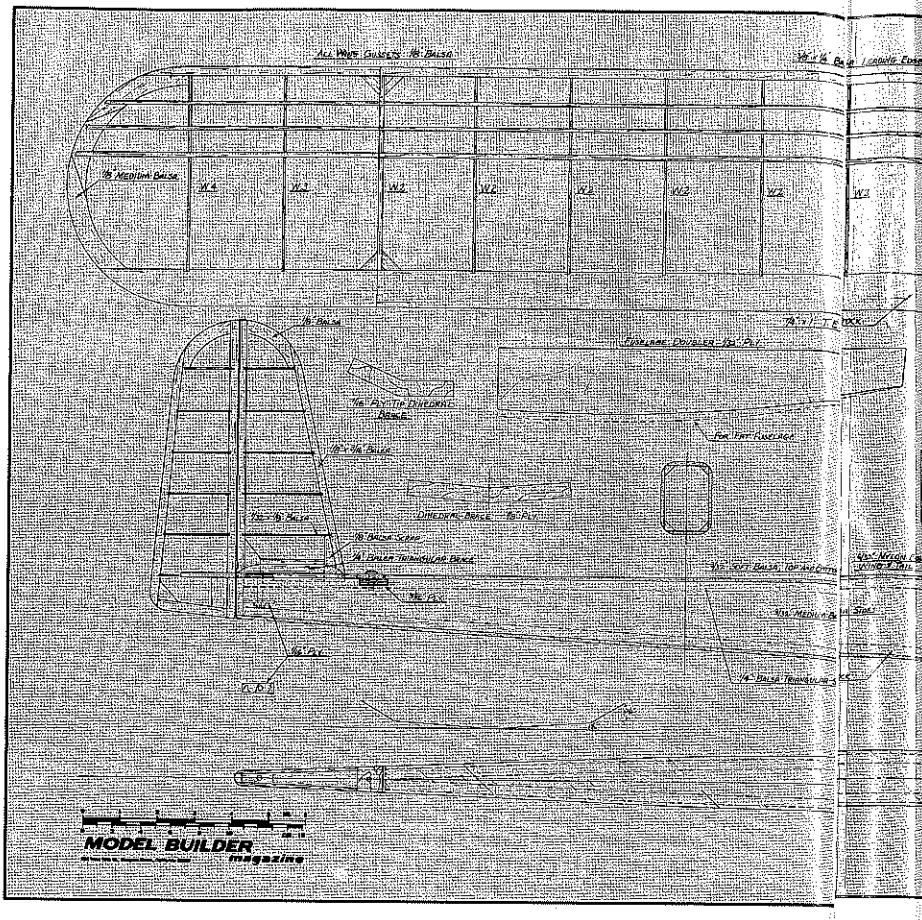
BY VAN HEREFORD



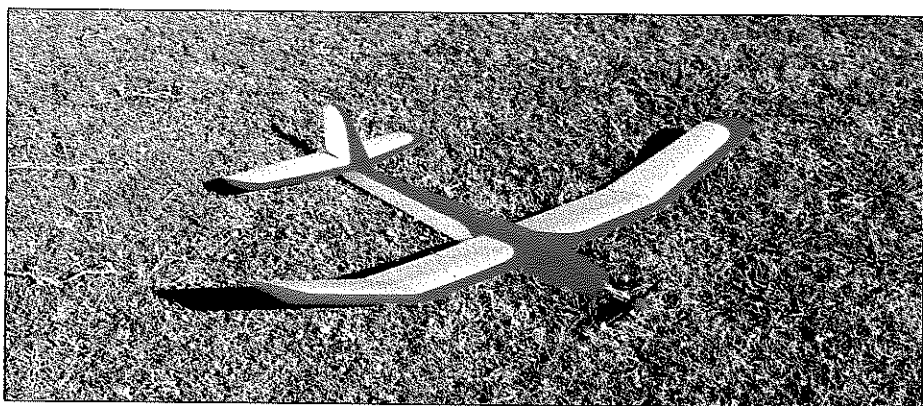
Designer Van Hereford's free flight background came in handy when designing the Shadow's lightweight structure.



The Shadow climbs away smartly from an easy hand launch—no running required. These RCD ships often climb to speck altitudes, so keep at least the bottom of the wing and tail dark and opaque for best visibility.



An interesting hybrid by Brock Henry of the Baton Rouge RC Club (BRCC) mates a Chuperosa fuselage and tail with a Cox Sportavia foam wing. Surprisingly competitive.

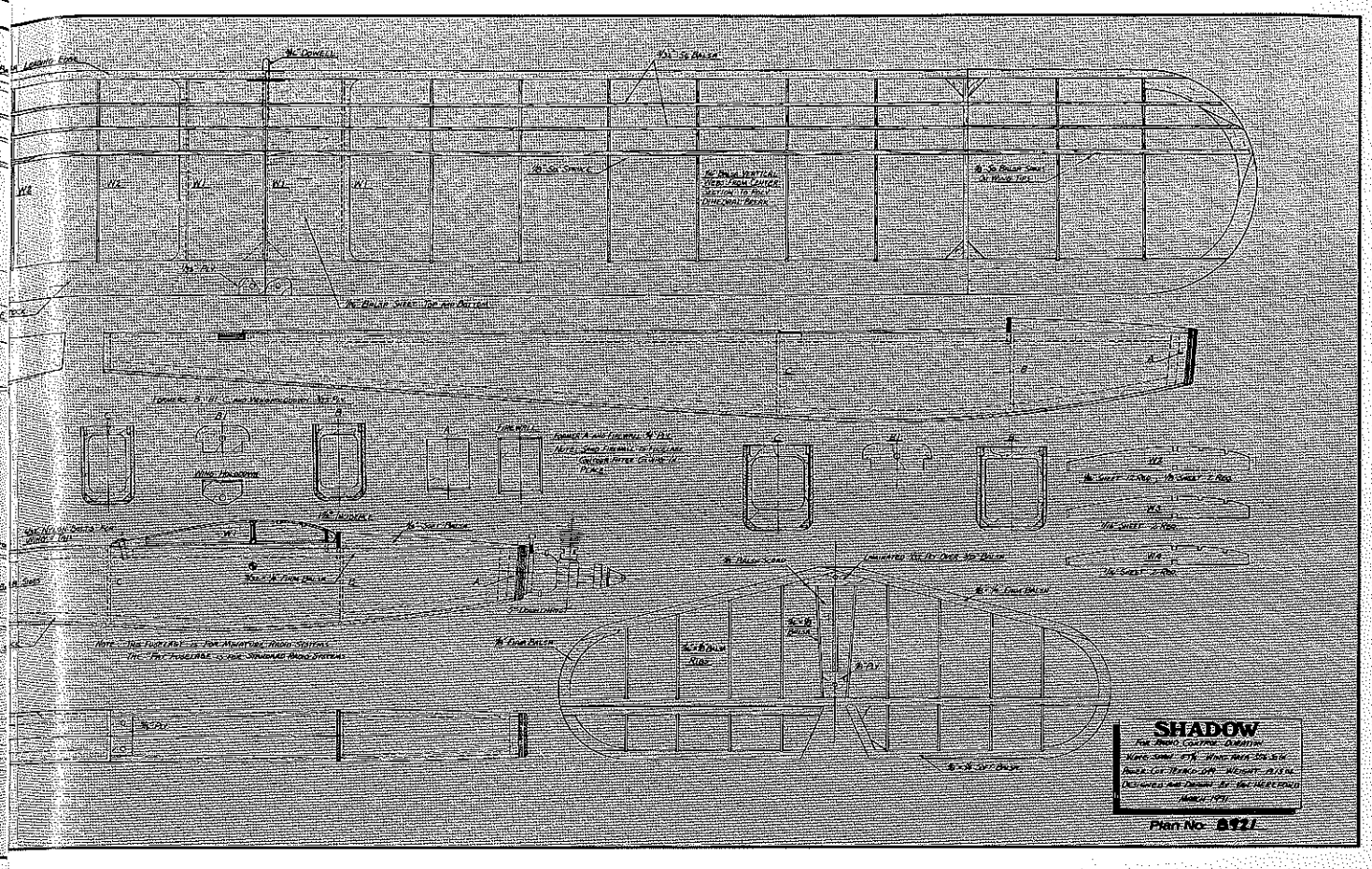


Fast-looking all-balsa design by Glenn Gresens incorporates a Jedelsky airfoil and full-flying stab.

need for special lightweight radio systems. A standard two-channel radio is all that's needed for RC Duration flying.

Fuel economy, not brute power, is the key to success in duration events where engine runs are limited by a fuel allotment. Almost any 1-1/2 meter hand launched glider kit will work for RC Duration flying. Gnomes, Wristocrats, Cox Silhouettes, Flippers, Ace Hi's, Kastaways, Tercels and many others have been successfully converted by simply sawing off the nose, gluing on a 3/16-inch plywood firewall and mounting the engine with sheet metal screws. Experimentation has shown that a wide variety of airframe shapes and sizes can provide good results, but the optimum wing area for RCD models will be in the 275 to 350 sq. in. range. At 300 squares, the required weight is about 17 ounces, which is a good load for reed valve engines. Larger and heavier models can be flown, but will require higher rpm and therefore yield shorter engine runs; and a long run under power is one of the keys to success.

After a reasonable break-in period, the Cox Texaco .049 with a 7x6 prop will run dependably at 6000 rpm for about five minutes. That combination of power and run time will take a fairly clean, 18-ounce model as high as hawk meat. Black Widows and Golden Bees can be adjusted to match this performance but can also be cranky and inconsistent at reduced rpm.



It is a widely known, but still explained fact, that many twelve-year-old boys, and some girls, have an uncanny knack for operating Cox power units. Some observers have suggested that these talented youths may have acquired this remarkable insight through reading the instructions. Whatever the source of his or her powers, when all else fails, a youngster to handle starting, needle setting, and other engine management work may be helpful. RCD planes are easy to fly if the engine is working well—so youthful powerplant consultants can be rewarded with stick time.

Van Hereford's Shadow is one of the first planes specifically designed for RC Dura-

tion flying. With a minimum of balsa selection and normal building techniques, the Shadow can be finished within the prescribed weight limits with standard airborne radio components and a 250 mA/H battery pack. The single elevator on the left side is easy to build and works perfectly. Based on Van's extensive free flight experience, the areas and moments have been optimized to allow smooth soaring performance with a minimum of control input, and when precise maneuvering is required, the control system shown on the plans will provide good response.

This is not a construction article, but scratch builders should have no trouble duplicating

the Shadow using the full-size plans. Select medium density balsa for the fuselage components and the strongest stock you can find for the wing spars. The wing and tailfeathers are pinned down over the plans in the age-old way. The fuselage is also built over the top view in the belly-up position.

The distinctive semicircular wing tips are aerodynamically very efficient and prompted one observer to remark: "It looks kinda like a tongue depressor, doesn't it?"

The following tips on finishing and flying RCD models reflect sometimes bitter experience and can be applied to scratch-built originals like the Shadow or any of the

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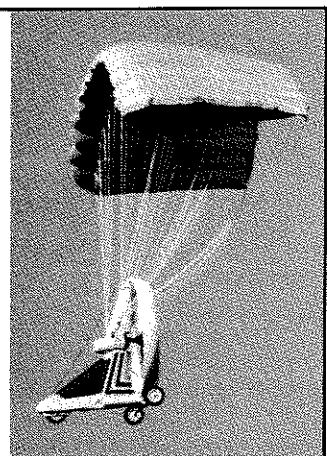


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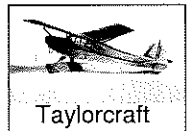


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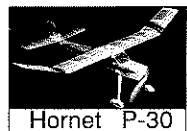


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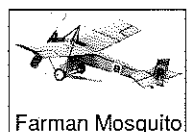
- ★ Taylorcraft 10.95
- ★ Stinson Voyager 10.95
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Hornet P-30

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RC DURATION continued from page 75

many glider kits that can be modified for RCD flying.

Resist the urge to display finely crafted structure through transparent covering, or the whole deal may be lost on the first flight. Even with opaque finishes in dark colors, RCD models routinely achieve altitudes where visibility may be marginal. RCD models climb slowly, so structures can be designed for small flight loads. High-G maneuvers are therefore prohibited.

In good weather conditions, RCD models can be flown into strong thermals while still under power. This is usually a good thing, but if the thermal is a "boomer" and the engine is going well, visibility may run out before the fuel. In such circumstances, the best procedure is to feed in down trim and fly out of the lift with wide, gentle turns. Loops and spins under power may break something.

Remove the tank on all new Cox reed-valve engines and check the position of the pick-up tube. The end of the tube should be at the bottom of the tank.

Experimentation with props will usually pay off in longer and better engine runs. Plastic or composite 7x6s are about right for 18-oz. models. For smaller, lighter planes, 7x8 props will often run for seven minutes.

Engine stoppages before the fuel runs out are usually the result of overheating. Try launching with a richer needle and add gaskets under the glow head if overheating persists. In hot weather, as many as three or four may be needed. The Texaco .049 glow head, which has extra cooling capacity, runs well on the other Cox engines. Don't expect new engines to carry the large props needed for RCD without a proper break-in period.

Fuel selection is an interesting area for experimentation. At low rpm and low compression ratios, very little nitro is needed. Ten, or even five, percent is usually enough.

A good pair of sunglasses will be needed. Those orange jobs with very high UV blocking capacity are the best. *Never* look away when the plane is at extreme altitude. RCD models have occasionally been lost as a result of a momentary lapse in pilot concentration.

The aircraft specifications and contest procedures for Event No. 702 have been tested and proven under contest conditions. Hundreds of flights by many pilots using a wide variety of planes have shown that novice RC fliers can participate in RCD along with more experienced modelers.

As in all competitive events, dedication and practice will usually produce a winning combination, but RC Duration has a place for everyone. For those who prefer to design special planes, the development of original designs like the Shadow will provide an interesting challenge. Smooth flying tech-

nique is an important factor and the necessary piloting skills develop quickly. Another built-in advantage is the ease with which even small groups can organize and stage RCD contests.

A CD and three or four timers can easily handle large turnouts of fliers on regular RC fields. The basic frequency control systems in place at all organized flying sites will allow planes to be flown simultaneously without complex flight line procedures.

RCD models make excellent trainers, particularly for young fliers. These light-weight, low speed, low cost planes can be safely flown in areas where heavier models would be dangerous. RCD competition can provide one of the very few environments in



The Shadow is Van Hereford's answer to the challenge of the RC Duration event. Note the elevator on only one side of the stab—easier to make, lighter and gives more than enough pitch control.

our complex world where youngsters and adults can participate in the same activity on near equal terms. It is totally unrealistic to expect modern young people to expend their time and talent on Delta Darts when they are fully capable of building, flying and financing RC models. It is also arrogant and not a little selfish to boast about how smart, energetic and skillful "we" were at age fourteen while belittling modern youngsters because they aren't interested in sticks-and-tissue and nitrate dope.

But enough of moralizing, if that's what the foregoing paragraph was. RC Duration has attracted a small but devoted following and there's plenty of room for others, young, old, and intermediate. Hopefully, as the new event gains in popularity, kit manufacturers will recognize the opportunity offered by this completely new branch of modeling activity and provide suitable products.

Meanwhile, there is no reason to wait. The Shadow is a well-proven and competitive design for scratch builders. Those who prefer kits can easily convert one of the many available 1-1/2 meter gliders. Experimenters will find that the RCD specifications provide a clear and practical arena for exercise of the boundless imaginative energy that has characterized modeling for so many years. **MB**