

# HONKER



*Just the thing for sport or fun-racing. Imagine where the high point of the day is getting four ships tip-to-tip coming out of the near pylon ... everybody carries that image with them long after they've forgotten who won the heat.*

# ROCKET

**By Dave Thornburg**

**F**or the past few months, a group of us here in northern California have been racing a "formula one" version of the Honker (June '73 RCM) and having a ball. The airplane uses the Honker wing and stab on a simple, realistic shoulder-mount fuselage, and our racing rules are only eleven words long! "No changes to airfoil, decalage, planform or Cox Black Widow engine." Period. Most of us fly rudder and elevator, although aileron/elevator is legal.

The object of the game is fun, not all-out speed. When the San Jose Wave Masters were holding their quarterly "Honker Races" last year, they were flattening the

undercamber, sharpening the entry, playing with the decalage, running pressurized Tee Dees and turning within one or two seconds of the best "open half-A" times --- too fast for us Sonoma County hippies! So we decided not to go that route. Instead, we wanted a stable, light, realistic airplane that built quickly and would be good for sport flying as well as fun-racing. The Honker Rocket fills that bill!

The Rocket is just as easy to build as the original Honker. The wing is the same simple all-balsa design: two pieces of light sheet glued together with 1/4" undercamber. No ribs, no spars, no nonsense. The wide fuselage has plenty of

*A fleet of 'Rockets' in various configurations. Note on HR-8, the aft end of fuselage was open for pushrod as in construction photos. This was on prototype only.*



## HONKER ROCKET

Designed By: Dave Thornburg

### TYPE AIRCRAFT

Sport/Fun Racing

### WINGSPAN

36 Inches

### WING CHORD

7 Inches

### TOTAL WING AREA

252 Sq. In.

### WING LOCATION

Shoulder Wing

### AIRFOIL

Undercamber

### WING PLANFORM

Constant Chord

### DIHEDRAL EACH TIP

1 1/2 Inch

### O.A. FUSELAGE LENGTH

28 1/4 Inches

### RADIO COMPARTMENT AREA

(L) 7" x (W) 2" x (H) 2 1/2"

### STABILIZER SPAN

12 Inches

### STABILIZER CHORD (incl. elev.)

4 1/4 Inches

### STABILIZER AREA

58 1/2 Sq. In.

### STAB. AIRFOIL SECTION

Flat

### STABILIZER LOCATION

Bottom of Fuselage

### VERTICAL FIN HEIGHT

4 1/4 Inches

### VERTICAL FIN WIDTH (incl. rudder)

4" (Avg.)

### REC. ENGINE SIZE

.049-.051 Cu. In.

### FUEL TANK SIZE

Tank Mount or 2 Oz.

### LANDING GEAR

Conventional

### REC. NO. OF CHANNELS

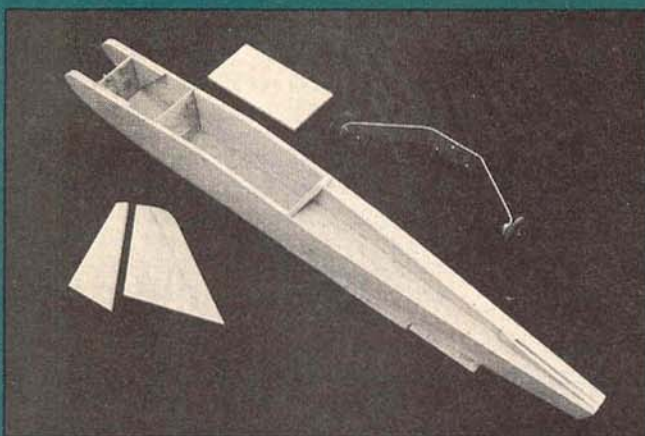
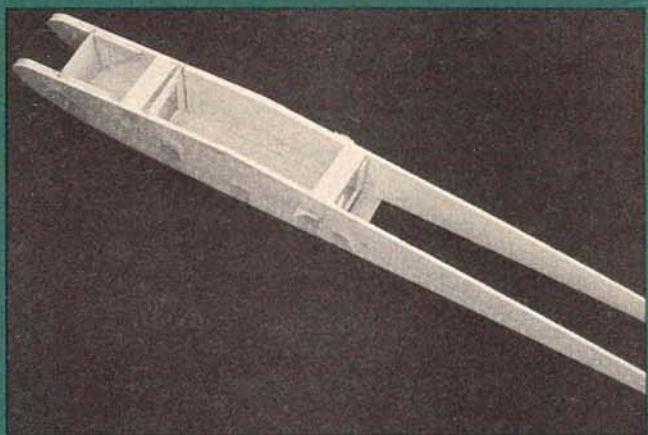
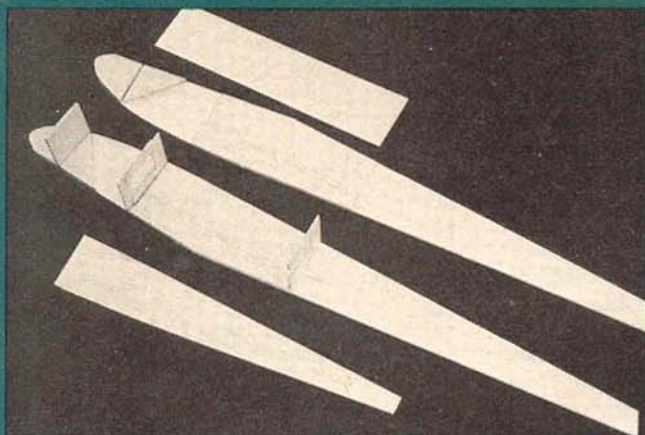
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### CONTROL FUNCTIONS

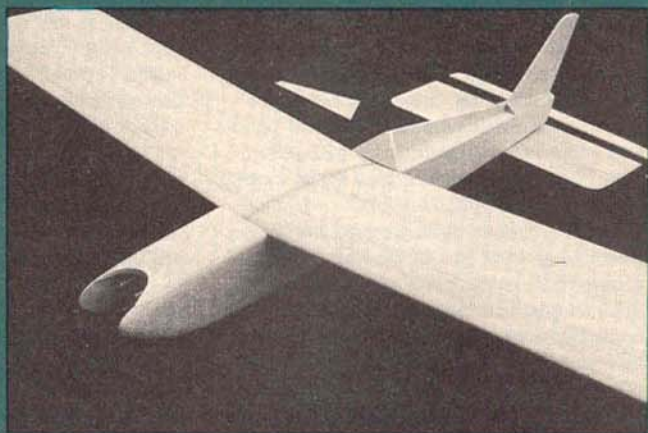
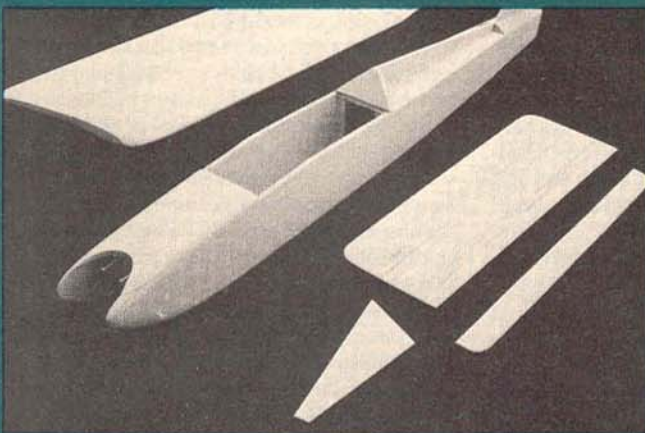
Rud. & Elev., or Elev. & Ail.

### BASIC MATERIALS USED IN CONSTRUCTION

Fuselage ..... Balsa and Ply  
 Wing ..... Balsa  
 Empennage ..... Balsa and Ply  
 Wt. Ready To Fly ..... 20-25 Oz.  
 Wing Loading ..... 11.4-14.2 Oz./Sq. Ft.



**ABOVE LEFT: Fuselage sides with doublers and formers in place ready to join sides. ABOVE RIGHT: Ply bottom glued in place and held together with masking tape. LEFT: Fuselage complete minus top cowl. Bottom rear sheeting to be trimmed. BELOW LEFT: Completed 'Rocket' sanded and ready to be covered. BELOW RIGHT: Completed 'Rocket' together for some hangar flying. (Don't we all do it?)**



working space around the radio. Up in the battery compartment there's room for a two-ounce tank, if you insist on using a Tee Dee or Medallion engine. The hole through Former One is large enough for a 500 mah battery pack, and I admit to having used one in Rocket number eight. But a 450 or 500 pack isn't recommended -- for this or any other half-A model. Weight is too important in small airplanes to toss in an extra ounce-and-a-half of batteries -- get yourself a 225 pack and some sub-miniature servos and find out what half-A flying is really about!

Like any other design that's been around awhile, the Rocket has had a few modifications. The first thing the guys did to her was "strip her down" for racing; they left off the landing gear and the entire triangular turtledeck, and bolted the wing in place like the big boys do. Hot rodders! They added about ten mph to the Rocket's flying speed! For punishment, we put these "Flattop Rockets" into a separate racing class. Just for photo purposes, I built one of these flattops, and I have to admit they do go together quickly. But I haven't been in a cold sweat to get her flying --- it looks a little

rapid for my reflexes!

So you have to make some choices before you begin your Rocket. First, will it be "flattop" or "formula one" style? The flattop version saves time, and not only because there's no turtledeck to build --- there's no cockpit to detail, either. If getting into the air quickly is important, build a flattop and leave off the gear. Using cyanoacrylates and 5 minute epoxy, you can frame her up ready for covering in just over two hours. But my honest feeling about the flattop is, if you want a Junior Falcon, go buy one! I still prefer the more realistic



and she's ready for plastic film. You could just paint it, instead, but I don't recommend it. Paint is much heavier, and it doesn't add any structural strength. In fact, it makes the wood more brittle. Stick with the plastic film.

If you're building the "formula one" style Rocket, adding turtledeck parts A, B and C is next. Part B must be aligned with care, otherwise your fin and rudder will be off-center later. Sand the bottom angle on Part A before gluing it in place. Use the fin for a spacer between the two C's during gluing, but be careful not to glue the fin itself --- it slips in place later, after covering. When A, B, and C are dry, sand them lightly to the cross-section shown, and give your whole fuselage the once-over with 220 sandpaper before covering it.

The rudder and stab can be flown with only a minimum of sanding to radius all the corners, but your Rocket will look a lot more "pro" if you'll take the time to feather the elevator and rudder as shown. Bevel one edge of each for hinging, as shown on plans. Don't be afraid of plastic film hinges: they're the lightest and strongest and easiest of all to make. When you have both tail surfaces covered, add the control horns and then epoxy the surfaces to the fuselage. You'll have to cut away the film covering over the rudder slot before slipping it in place.

The wing is built from a piece of 3/8" x 3" soft sheet and a soft piece of 1/4" x 4" Sig tapered balsa. If you can't locate the tapered sheet, use 1/4" x 3" stock and glue a 1" strip of trailing edge to the rear to bring it out to a full 4". Pick your wood carefully --- the finished wing, ready to cover, should weigh no more than five to five-and-one-half ounces. Bevel the 1/4" sheet appropriately (the angle is 7°, if you happen to have a shaper) to make a tight joint with the 3/8" balsa. Use masking tape on the underside of the joint while the glue dries, and jig the undercamber with a piece of 1/4" square balsa under the joint line. (This is how we test racing wings to see that the undercamber is legal: put them on a flat surface and try to slide a 1/4" dowel under them. If it won't go, then the wing was built too flat, or too much was sanded off the bottom of the leading edge. Either way, the wing is illegal.) When the wing dries, shape it to the airfoil section shown, using a block plane (easy!) or sanding blocks with progressively finer paper (hard!).

If all this sounds like too much hassle, you can order hand-built wings, machined to the proper airfoil and finish-sanded, from the people who make Honker kits. Price is \$11.95 plus \$3.00 shipping from: Mark's Models, 1578 Osage Street, San Marcos, CA 92069.

You can cut and glue the dihedral joint either before or after you cover the wing. I prefer before --- it's neater. Either way, you want to mark the centerline carefully with ruler and 90° triangle --- no room for sloppy measuring here! Cut the wing in half with an X-Acto knife or coping saw. Block-sand each side to a slight angle, depending on

dihedral desired. Try to make as neat and tight-fitting a joint as you can. When you're ready for the 5-minute epoxy, punch each root full of pinholes, 1/8" to 1/4" deep. Rub the epoxy well into these holes before joining the panels. This will give you dozens of miniature dihedral braces --- a strong joint! Block one wingtip up at the proper dihedral (1" for aileron, 3" for rudder) and allow it to dry thoroughly. Sand the joint smooth and go back over it with a second coat if you wish, using a moistened finger (epoxy tastes awful!) to smooth the glue before it sets. Cover the wing, and add any cockpit details you wish.

Go over all exposed balsa, especially the engine compartment, with dope or epoxy paint for fuel proofing. Don't skimp --- fuel proofing is what makes a model last. I like to pour a 1/4 ounce or so into the battery compartment and slosh it around. But you'll want to mount the engine first, or the paint is sure to clog the blind nuts. Drill the holes and mount the landing gear, then double-coat the whole inside in the gear area with epoxy glue, for extra strength.

The object of radio installation is always to get every piece as far forward as possible, to avoid tail heaviness (**nobody** builds models too nose heavy --- don't worry about it.) Wrap your batteries in foam rubber and place them clear up against the firewall, stuffing the rest of the compartment with foam rubber or wadded paper to keep things in place. Pad the receiver and place it against Former One. I use double-sided 1/16" foam tape for mounting my servos, even though most manufacturers don't recommend it; I've never had a servo fail due to vibration. But then, I fly mostly Half-A ships --- and gliders! Position your servos snugly against the receiver, to hold it in place. Make up two pushrods and attach them to the surfaces with the 3/64" wire to the rear. Never put adjustable clevises on the rear of a small airplane like this --- put them up front on the servo end. And keep even the 3/64" wire as short as possible, because every single **gram** counts when it's that far aft of the Center of Gravity.

For aileron control, follow the drawings on the plans. Two ailerons are shown, but I've flown Honkers for years with only one. It's plenty.

Now what about wing hold-downs? There are three tried-and-true methods for the Rocket. First is the conventional rubberband system: two 3/16" dowels and four #62 rubberbands. It doesn't look too fancy, but it's simple. You need a piece of 1/16" ply on the wing trailing edge to keep the bands from sawing into the wing. And be sure to epoxy the dowels well, down inside the fuselage. The second system is internal rubberbands, stretched between a J-bolt through the wing dihedral joint and another J-bolt through the fuselage bottom. Again, lots of epoxy for safety. And don't ever use a single rubberband, even doubled or tripled. What if it breaks? The third system is a pair of Sig threaded blocks (part #SH219) epoxied to either fuselage side (I like a little 1/16" ply here, to spread out the

strain.) Use 8-32 nylon bolts, and put large thin washers under the heads to keep them from pulling through the wing. Very pro!

#### Flying:

Your Honker Rocket **must** balance in the range shown. If you've built the tail light, shaved off every excess gram, this should be no problem. Don't ever try to fly a Rocket (or any small R/C plane) in a tail heavy condition; you're almost sure to crash. Even moving the CG as little as 1/4" behind the range shown makes the plane ultra-sensitive to the elevator. Be certain that the controls move no more than the distances shown.

There are only two important angles to determine longitudinal trim: **decalage** (the difference in angle between the wing and stab) and **downthrust** (the nose-down angle of the engine which keeps the plane from trying to loop or stall). Both these angles are built into the Rocket's fuselage sides, so you should have no trouble achieving a flat glide with the correct CG. Just be sure the rudder and fin are straight, and your engine has no side thrust, and your Rocket should fly "right off the building board."

Always launch your Rocket with plenty of airspeed, and directly into the wind. Like the original Honker, it will probably seem sluggish for the first couple of seconds of flight: the tail will go down, she will seem to wallow, then start dogging along like a slow and stable trainer. Then, just about the time you're beginning to think, "What a boring airplane," the tail suddenly comes up, the wing goes on step, and off she goes --- like a Rocket!

#### Troubleshooting:

Here are a few tips for flying your Rocket that apply to just about all Half-A R/C planes. If you're having more frustration than fun with Half-A, chances are one of these four suggestions will help.

(1) **Model won't climb.** Here's the scene: your plane staggers along after launch at the same five feet of altitude until your first rudder command --- which promptly flips it on its back and crashes it! Sounds like your plane is either underpowered or overweight, or both. A Cox Black Widow or Golden Bee should fly a 20-25 ounce model at sea level with power to spare, **provided the engine is running properly.** Are you using a high-nitro fuel, such as Cox Racing Fuel? Don't waste time and money on cheaper "sport" fuels: Cox Racing, Fox 40-40, K & B 1000 are worth the extra money when you're flying R/C. Especially with the Golden Bee, which doesn't have the double-ported cylinder of the Black Widow and, hence, is a bit weaker.

And how about your prop? I know a Top Flite nylon will outlast a Cox plastic ten to one, but it won't deliver the thrust that a Cox will. Our standard racing prop for the Widow is the Cox 5.5/4 gray plastic; it's the prop I use for sport flying, as well. And check your glow head: is it seated tightly? Did you forget to install a gasket with it? Look over the info sheet that comes with the engine for further suggestions on how to

increase power output.

If your engine is screaming and your plane flies fast but still won't climb, it's probably too heavy. Weigh it on a good scale. Thirty ounces is too much weight to ask a reed-valve engine to lift. Even 27 is overweight for a Rocket. (My heaviest, with a 500-mil pack and Futaba S-17 servos, weighs 25.2 ounces.) If you have trouble building light, or if you have nothing but an overweight ten-year-old radio to fly, then Half-A isn't for you. Build something in the .19 to .40 range instead. Small, heavy airplanes just aren't for amateurs --- they're no fun to fly, even for the experts. Removing the landing gear is one way to get rid of weight and drag both; if your ship is marginal, it might get you airborne. But a smaller radio, and lighter building, is the ultimate answer for successful Half-A flying.

**(2) Plane crashes right after every launch.** It's very possible that the launch is at fault. Launching is a learned art --- nobody's born with it. Find some tall (24'' or more) grass and practice throwing the plane straight and level (radio on, engine off) until you can get a long, smooth, straight glide out of it. This will accustom you to the plane's natural flying speed, so you won't be launching too hard or too soft. It will also let you know if your plane is badly out of trim.

**(3) Engine quits on launch.** The engine's probably set a bit lean --- back the needle valve out 1/4 turn or so. Also, you may have to learn to run with the plane and accelerate it more smoothly into the launch --- a hard jerk will often kill an engine.

**(4) Plane always gets blown downwind.** What are you doing flying Half-A in that much wind? If the wind is more than 5-10 miles an hour, flying a small airplane becomes more challenge than fun. It's just like trying to row a boat in a strong river: all your energy goes into fighting the current.

Small planes like the Honker Rocket are designed for warm, calm evenings at the local schoolyard. (Snap on a QZ muffler to keep the neighbors happy.) When you get bored with just roaring around, shoot a few full-speed touch-and-go's on the sidewalk. Or round up a couple of flying buddies and a flag person or two and go race around the goal posts. There is nothing prettier than three evenly-matched Rockets banking into the far turn together, wingtip-to-wingtip, engines screaming! Nice smell of castor in the air. Flip, flip, launch 'em together, seven quick laps, neck-'n-neck finish and then roll inverted to kill the engines! Hoo! I won that one! Let's fuel 'em up for another run! □

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