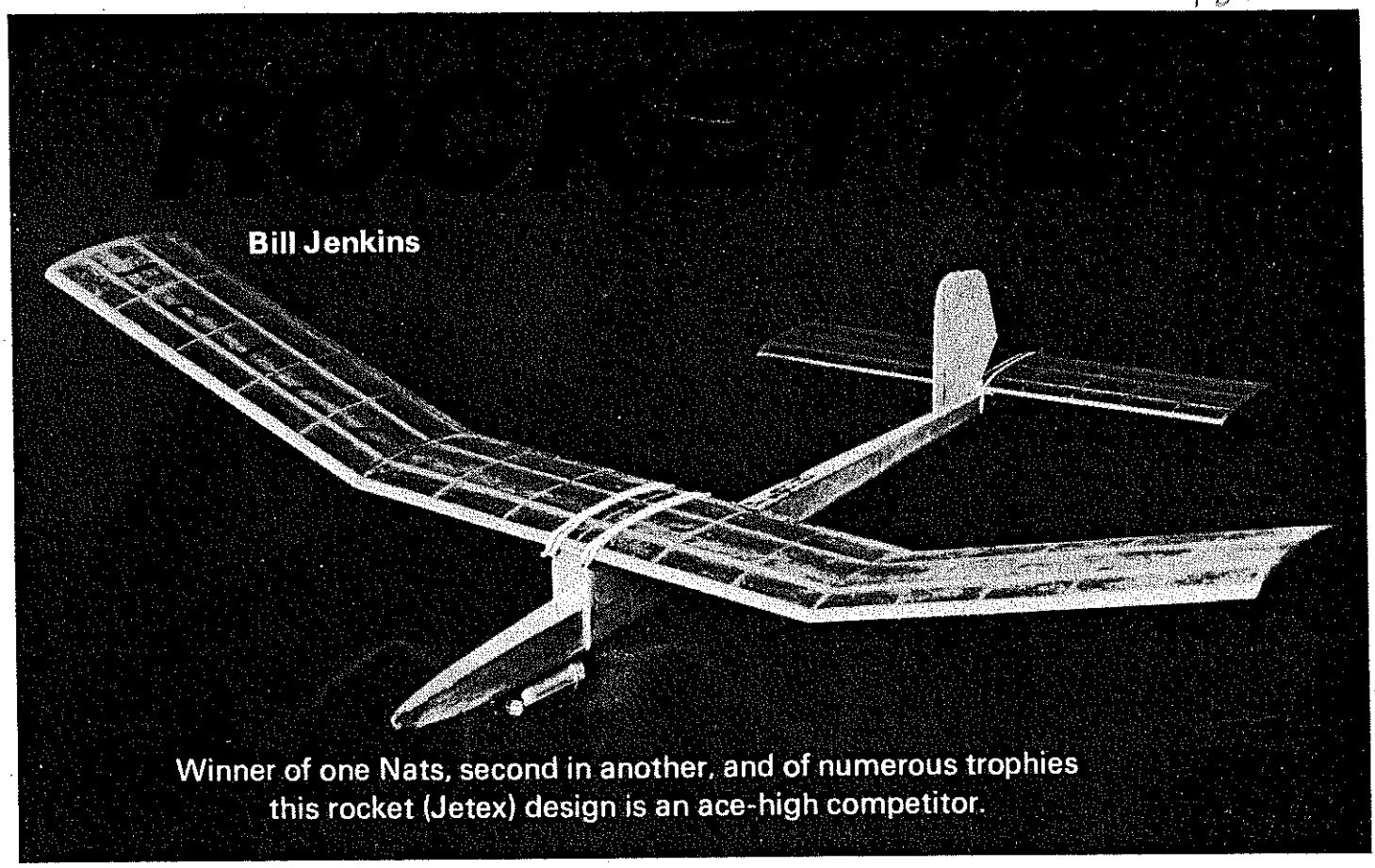


Winner of one Nats, second in another, and of numerous trophies this rocket (Jetex) design is an ace-high competitor.

DID YOU EVER dream of designing your own model, test flying it a few times, then taking it to the Nationals, and winning with it? Well, that's exactly what happened to me.

I was looking for a good rocket to round out my fleet of free flights, when I saw R. F. Tanner flying his rocket in Clarksdale, Miss., on Memorial Day, '72. To my surprise, I learned he was living here in Memphis at the time, so I got in touch with him to take a look at his model. Using some of his basic ideas, I stretched out his design, changed the airfoil and dihedral, to come up with the Rockette. It took only about two weeks to build without plans, my only guide being a "feel" of what I wanted, and some fundamental dimensions. In fact, I have spent more hours on this article than I did on the building of the model!

When finished, the Rockette's "extensive testing" program consisted of four flights, three of which were trimming flights to check power and glide patterns. It flew so well right off the board, I could sense it had even greater potential than I had imagined.

The fourth flight took place in a bean field in Arkansas, where there is plenty of room to chase, and thermals are abundant. The main thing I needed to know now was how it would ride a thermal. I found out on the first attempt, when I launched it into a boomer, and it got as high on its power run as some of my gas ships get on their 10-sec. motor runs. It kept climbing in a stable glide circle with no stalling or tendency to dive, D.T.'d after 30 seconds, then took about a minute and a half to come down (which gives you some idea of how high it was). After that flight, I packed it up and decided not to fly it again, at the risk of damaging or losing it before the Nationals:

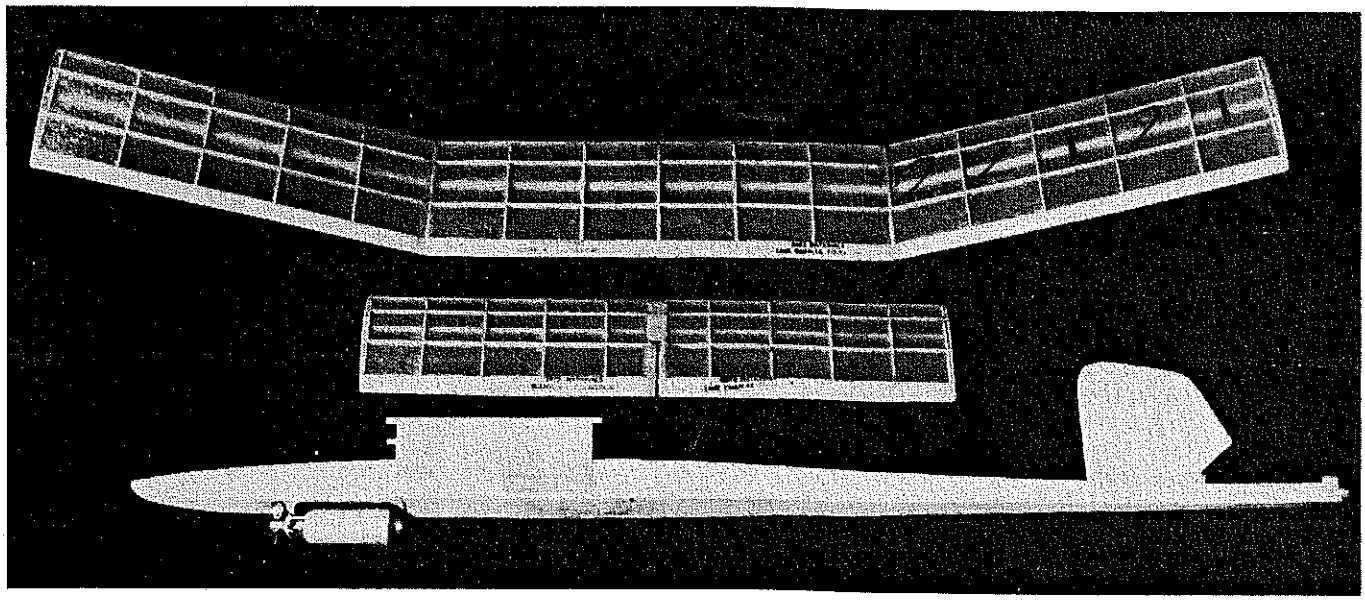
Photos by Allen Worley

Bill says he was never believer in fancy-looking models being able to fly better than plain ones—thermals don't care how fancy it looks.

So, after only four test flights, the Rockette won first place at the '72 Nats. Truly, a Cinderella story for any free-flighter! When it was first built in 1972, the model was intended only to fly at the Nationals, but I had no idea it would hold up as well as it has through these last three years of contests. Somehow, it has managed to escape airplane-eating trees, and getting lost in high grass. In fact, much of the time, I have been able to catch it before it touched the ground! Circumstances prevented my making the '73 Nats, but at Lake Charles in '74, the Rockette took second place, and has won a few other local contests along the way.

In building the Rockette, you want to keep it light, and as warp-free as possible. The less warps, the smoother it will move through the air to give better performance. Choosing the right wood for the job is the trick to good building. The hobby shop owner will give you a wary look while you plow through all his wood, but a little care in choosing light, straight, well-grained wood will pay big rewards in a strong, light, competitive airplane. Then, it is up to you to pick good air to win at a contest; and that is the way it should be.

This model is fairly easy to build, and has simple, uncluttered lines. I have never been a believer in fancy-looking models being able to fly any better than plain ones. A



good flier can make a bad design look good, and a poor flier can make a good design look bad. After all, a thermal doesn't care how fancy your plane looks. In all this clamor to find a good design, when looking over contest results, I think it is more important to look at the flier and how he flies the plane, not at what he is flying.

This plane doesn't have a spectacular climb or an excellent glide, but what it does have is a good, steady climb, and a consistent glide pattern every flight. Couple this with a reliable system to ignite the rocket every time without a misfire, and you are left free to spend your time picking thermals. (Out of six flights in Nats competition, I had only one misfire.) Once upon a time, I tried to share my secrets with others, but no one would listen. So, if you are interested in a dependable firing system, and getting a set of washers to last 10 or 12 flights, look me up at a contest sometime, and maybe you can talk me out of some of those secrets.

I will give away one secret here, and that is to always use the screen (if you don't already). It keeps the trash that is breaking away from the surface of the first pellet, from clogging the nozzle, and interrupting the power flow. It was suggested at the '74 Nats Free Flight Symposium, to leave out the screen and to sprinkle loose, ground-up pellet onto the last pellet to get it to light. I saw some people using that method in competition, and while they stood around waiting for the motor to stop sputtering, my plane was 20 feet high and climbing.

I fly my plane left, left, using about 1° of right-thrust to keep the nose up in the power pattern. I used to have a lot of trouble with other designs climbing nicely, then nosing over and powering in, about half way into the motor run. The longer the motor runs, the more pressure it seems to build up, and the faster the plane goes (also, the more effective all those little warps become). A warp that doesn't show up at all in the glide pattern, can be disastrous in the high-speed climbing portion of the flight; and, if you have a pile of balsa wood confetti on the ground, you will never know what caused the crash.

When launching, don't try to throw the plane hard. The motor is still a little weak on thrust at first, and if the plane stalls early in the flight, it takes a long time for it to recover, and start back up. If you launch it as you would to test glide, it should smoothly start into it's climb, getting steeper as it goes up with a slight left turn (about 1½ turns to the power flight).

This leads us to competition, which, to me, is a game of who can catch the most thermals. Pay attention to details, load your motor carefully, check over the plane before every flight, making sure the wing and stab are lined up, and that everything is ready to go. Remember, without some form of lift, a plane won't max. Generally, a good foundation in hand-launch glider will provide a "feel" for picking air that is helpful in successful rocket flying. As a friend of mine, Prof. George Perryman always says, "Do nothing in haste, except chase!"

Construction

Start your wing construction by gluing the ⅛" spruce to the 3/16 × ⅛" balsa leading edge. The spruce cap stripping may seem an expensive consideration in weight,

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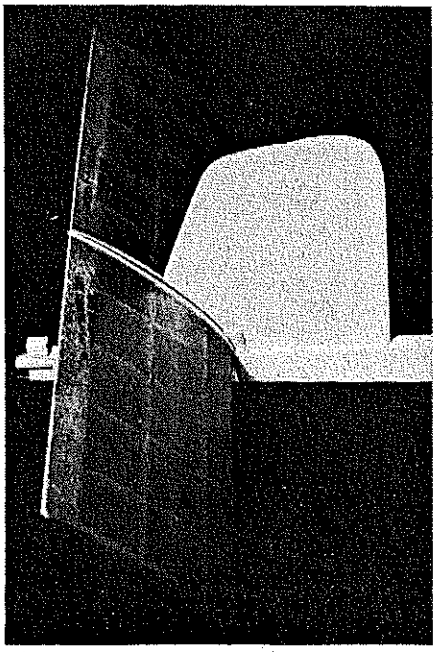
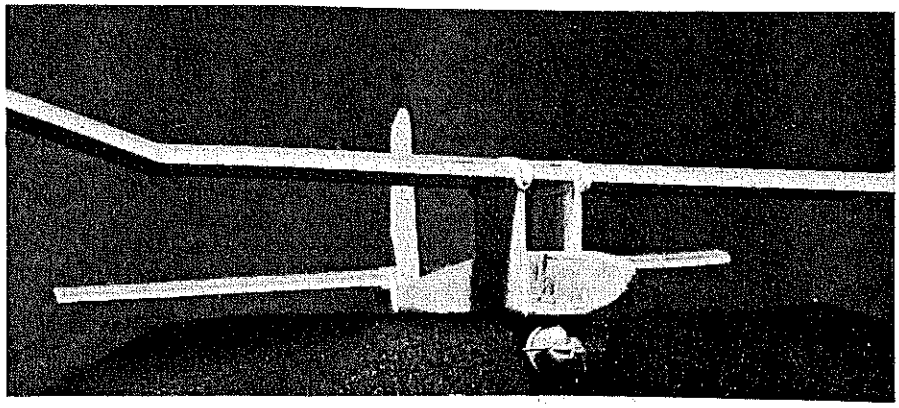
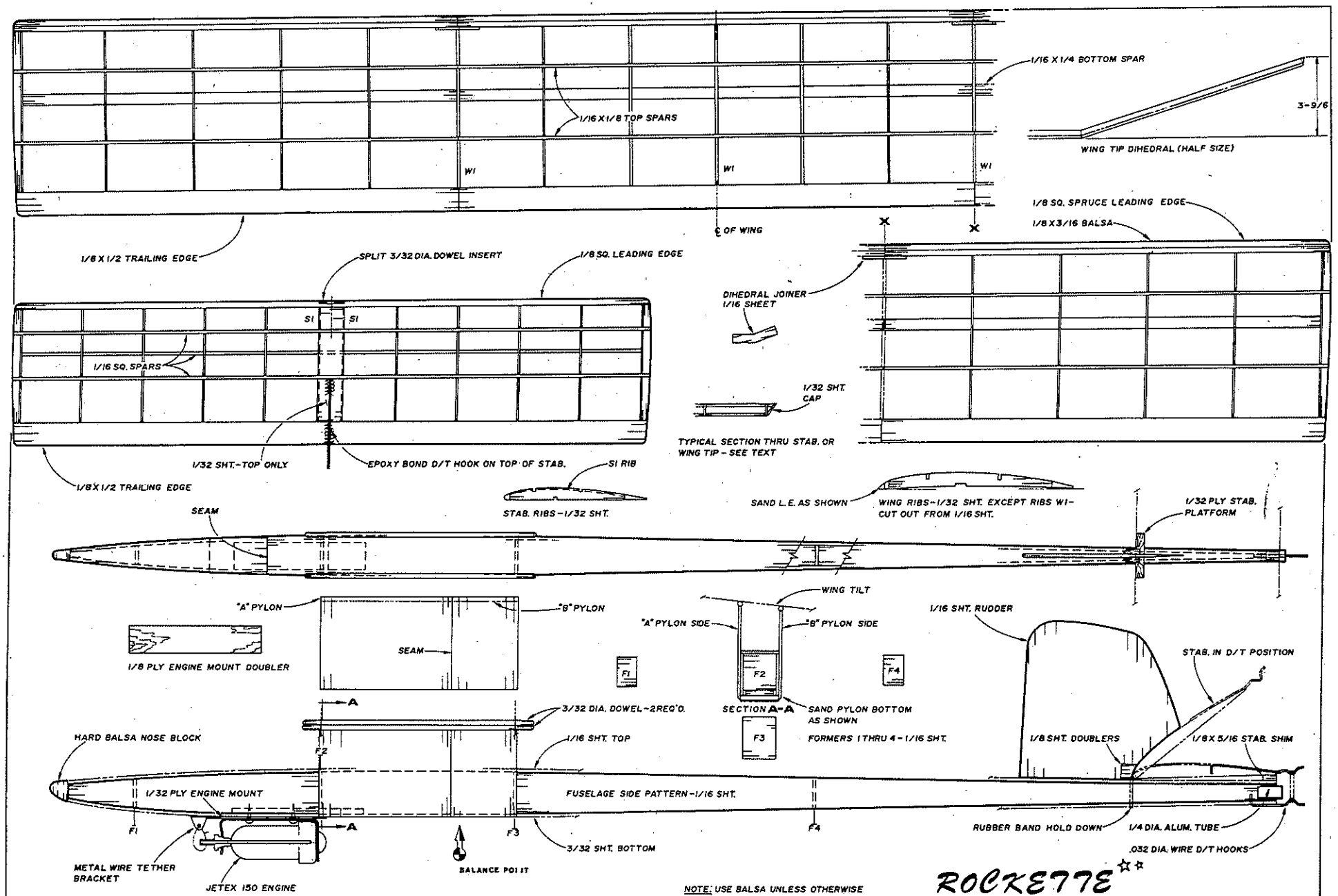


Stabilizer in popped-up position shows stab incidence block and DT snuffer tube at extreme tail end of the fuselage.

Banded up and ready to go. After dethermalizing at 30 seconds into the flight, it may take 90 seconds to descend to the ground. Sharp leading edge is intended to have turbulator effect.





FULL-SIZE PLANS AVAILABLE . . . . SEE PAGE 104

lage.

The propeller and nose block should be given at least three coats of dope before assembling. Ensure that the propeller blades are properly balanced and track properly. Finished weight of the propeller assembly should not exceed 24 grams.

Flight Preparation: Make up at least two ¼ in. rubber motors of 16 strands. After washing, drying and lubing the motors, break them in initially using the stationary stretch method. To do this, I hammer two large nails securely into a fence about six motor lengths apart. A motor is then stretched over the nails and left there for five minutes. The stretched motors should be about 42 in. long.

Now assemble the completed model and insert a rubber motor. Check that the alignment, wing wash-in and incidence, and thrust are correct. Also verify the CG location with prop blades folded. Shift the position of the D-T timer if necessary to ensure the CG is located precisely as shown on the plan. Ready to fly weight should be equal to or less than the 222-gram total itemized on the plan.

For the modeler interested in serious unlimited rubber competition, I believe a reliable, sturdy winder and a winding stooge are musts. A winding stooge custom designed for your own car is relatively easy to build. The twin advantages of an immovable holder when winding, and freedom to test fly alone, are significant.

Flying: Under calm conditions, hand glide the model and add packing under the stabilizer leading or trailing edge until the model floats with just a slight left turn.

The ship should be very docile to adjust under power. Start with about 200 turns. The model should climb to the right, straighten out before the prop folds, and then glide to the left. Use thrust adjustments, rudder tab, and stab tilt to obtain this pattern. Proceed in increments until full turns are reached. Under full power, the model should climb in a steep right corkscrew, with the nose pointed up until just before the prop folds. Motor run should be about one minute.

One of the advantages of the unlimited rubber class is that the duration potential exceeds the flight maximum, unless down air is encountered. Unlike a Wakefield, therefore, I do not believe it is mandatory to wind the motor to absolute capacity on every flight.

I normally wind the motors on my Big Boy between 700-750 turns, depending on the feel of the rubber. Maximum capacity, by contrast, is about 800 turns. While Sig or FAI Model Supply rubber, in my opinion, is not equivalent to Pirelli for Wakefield events, it is certainly adequate in Big Boy. Because of its smooth texture, it is also less liable to nick or break. On several occasions, I have used the same motor for all three competitive flights!

If you are unable to build your Big Boy down to the structural weight shown on the plan, and the climb suffers accordingly, I suggest an increase in power from 16 to 18 strands. One of the real joys of the unlimited rubber event is to watch your model climb to a great height, which it may not do, unless thermal assisted, if underpowered.

Try unlimited rubber—you'll like it!

Fancy Pants/Margolin

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exhibited the same smooth characteristics. Just be sure that your ship is balanced as indicated on the plans, even a little nose weight is desirable. You can go to heavier gauge aluminum for the landing gear and plenty of fuelproofing in the engine compartment. This usually will put the balance in the ball park. Lots of fun building and flying.

Rockette/Jenkins

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but it is intended to protect the leading edge from nicks and dents. Also, while gluing it to the balsa leading edge, it gives you a chance to straighten out any warps, so that you have a straight leading edge to work with. I sand the shape of the leading edge before gluing the framework together, to keep from putting stress on the 1/32" ribs. The Rockette's leading edge is sanded at a sharper angle than other airfoils I have seen, and this seems to give it a slight turbulator effect.

To keep the wing light, 1/32" ribs are used, except for the three center ribs and the dihedral ribs, which are 1/16" for strength. When building, block up the trailing edge 1/32", so it will better follow the line of the undercamber. Glue the ribs to the leading and trailing edges and insert the top spars. When dry, turn the framework over and glue in the bottom spar. It may seem unusual for the bottom spar to lie flat, but I always have trouble getting the tissue to follow the undercamber, and this gives the tissue more surface to adhere to.

To make the wing tip, allow the spars to extend past the last rib about ⅛", then sand them off at an angle, capping the wing tips with a light sheet of 1/32". Sand to airfoil shape. I finished the tips before gluing the dihedral joints, because it is easier to handle the tip by itself. The dihedral joint is made by sanding the ends of the center

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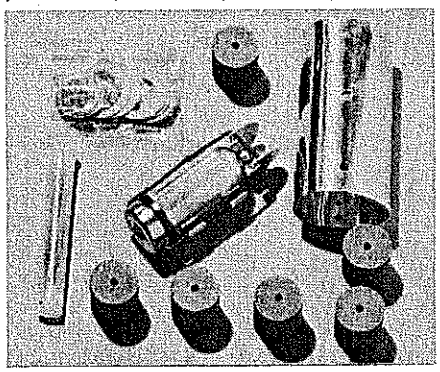

Tigerjet Engines: Similar to the familiar Jetex engines, these are Japanese engines imported by a Canadian distributor. Type A is equivalent to a Jetex 50, Type B to the Jetex 150. Prices: Type A, $6.50; and Type B, $8.50. Fuel: 10 pellets for Type A, $3.50; 6 pellets for Type B, $3.50. **Academy Products, Ltd., 51 Millwick Dr., Weston, Ont., Canada.**

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section and the ends of the tip, so that they mate evenly—each sharing the angle of the joint, and the dihedral rib following this angle. I used red tissue on the top of the wing and stab, and black on the bottom. After years of trying different colors, I decided this was the best combination. As the plane drifts away from the timer and becomes a little speck in the sky, the black seems to stay visible longer. The red is easy to spot in grass, wheat, beans, or cotton (except for a certain time of year when those little yellow and red blooms pop out).

The stab is easy to build, but enough attention must be paid to selection of wood, and to construction, to produce a warp-free structure. When cutting out the spars, leading edge, and trailing edge, leave about ⅛" excess on each end to finish the tips like the wing tips. Glue the framework together. When dry, sand the tips at an angle and cap with 1/32" sheet. Sand to airfoil shape. Cut three pieces for the center-section planking from 1/32" sheet. One piece should fit between the leading edge and the first spar; the second piece, between the first and second spars; and the third piece between the second spar and the trailing edge. All three pieces should fit snugly between the ribs. Curve them slightly to match the curve of the airfoil and glue in place. To strengthen the leading edge, split a 3/32" dowel, and inset it in the center of the leading edge (being careful not to cut the leading edge in two). When dry, sand to the shape of the leading edge. Cover the stab, and bend and epoxy in place the 1/32" wire.

I used lightweight A-grain sheet for the fuselage sides, top, and bottom, and just enough formers to keep the sides square. One at point A, one at B, one just behind the pylon, and one about an inch and a half from the nose, is sufficient. After cutting out the fuselage sections according to the plans, glue the two side sections to the bottom with the formers in place. Be sure to glue the ⅛" plywood motor mount to the inside of the bottom of the fuselage, making it long enough to give ample room for adjusting the motor to attain the correct CG. When dry, glue the top of the fuselage in place. Allow to dry, then glue the nose block in place, and sand to shape after glue has set. The shape of the Rockette's nose is a departure from the current trend in rockets to cut the nose off just ahead of the motor. I believe that the longer nose adds to the aerodynamic efficiency of the design, in that it produces a more stable glide.

Next, sand the body smooth. Then glue pylons in place, being sure that the right one is slightly taller than the left, to give the wing built-in tilt for left glide. (Check plans for details.) Cut the 3/32" dowels to length. Wrap one dowel with a piece of fine sandpaper, and gently sand the top of each pylon with it. This shapes the top of the pylon to the curvature of the dowel. Glue dowels in place. Next, glue the stab rest in place.

Shaping the rudder to form the D.T. stop, is an old, but effective trick to eliminate the use of a D.T. wire. Quarter-grain is used to keep the rudder from warping, without having to use a stiffner piece. Cut the rudder to shape, and glue into position. When this is dry, glue in the ⅛" rudder reinforcements. These also provide more surface for the stab to rest against. Now, the ¼" aluminum tube for the D.T. fuse can be glued into place, and the 3/32" wire, and the ⅛" block added.

Install the 1/32" plywood motor mount, again leaving it long enough to adjust the motor for the CG. A ¼" soldering lug is bent and glued to the body, ahead of the motor mount, to provide a base for the wire tether, which is required by AMA. (Should be used at all times to keep the motor hanging around.)

Finish the model with two coats of 50-50 dope to keep it light. Use a Jetex 150 motor. To attain the CG, rubberband the motor clip with the empty motor onto the body. Slide the motor back and forth until the model balances. Mark with a pen. Test glide the model to make sure the glide is smooth and stable. Adjust the motor until you are satisfied with the glide, then mount the motor clip.

One final word about the Nats—if you are serious about winning, don't let the size of the meet overwhelm you. Just think of

it as a small meet with a lot of people. With patience, and the skill of catching thermals (and a little old-fashioned luck), you could win a first place at the Nationals!

Yen to Fly/Hannan

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building a hand-launched model. Cut an additional short piece of the stock for the nose piece, as shown, but do not glue it on at this time.

Bend the rear rubber hook from thin music wire, force into the rear of the fuselage stick, and secure with a film of model airplane cement or epoxy. White glue and Titebond do not seem to adhere well to wire.

Decor: The decorations add to the charm of this aircraft, and may be applied in either of two ways. Fastest, but probably not the neatest, unless you have an unusually steady hand, is to simply draw them on with a brown or black fiber-point pen. The second, and more difficult method, is to cut the markings from colored tissue paper. A good approach to this is to trace the characters onto thin paper, and to tape it over the colored tissue, which in turn, is taped to a sheet of cardboard. A sharp-pointed modeling knife is used to carefully cut through the tracing paper, colored tissue, and just slightly into the cardboard beneath. The results should be clean, neat tissue edges. Note that both "YEN" signs may be cut at once, by using two layers of tissue. Apply the characters with clear dope.

Assembly: Glue the wing onto the fuselage stick, being certain it is properly aligned. Add the vertical fin, centering it on the assembly, as viewed from the top. It should also be vertical as seen from the front of the model.

Balancing this aircraft is somewhat different than usual: Slip a North Pacific "Skeeter" propeller and bearing assembly onto the front of the fuselage stick. It will, of course, be a loose fit at this stage. The model should balance near the point indicated on the plans. Probably, however, it will be slightly nose-heavy. If so, cut a small amount off the front of the fuselage stick, replace the prop assembly, and balance again. Repeat until model will hang level when supported by the finger-tips on each side of the balance point. Now glue on the lower nose piece, and bevel the top of the fuselage stick to obtain a downthrust angle. Reinstall propeller assembly.

Flying: Install a short loop of 3/32 or ⅛-in. rubber, and try a few test glides. These may be performed indoors if you have enough room space, or outside in calm conditions. The craft should have a long, straight glide. If model dives, trim a tiny bit more off the front of the fuselage stick and try again. If it stalls, a small amount of clay ballast may be added to the fuselage front.

Now, wind in about 75 or 100 turns of the rubber motor and launch gently. If model turns excessively, it may be corrected by bending the paper rudder opposite the direction of the turn. In extreme cases, a tiny amount of clay ballast may need to be added to the wing tip opposite the direction of the turn. Gradually increase the number of motor winds until the model can safely handle a full row of knots or more. An increase in power may, however, bring about the need for slight changes in balance or turn adjustments.

Next, a longer, lubed rubber motor may be installed, and winder wound for best performance. You may wish to experiment with different sizes and loop lengths. If model loops under high power, slightly increase the downthrust angle.

Optional: This craft may easily be equipped with landing gear, which will permit rise-off-ground starts, with some decrease in overall performance. The complete landing gear assembly from a North Pacific Sleek Streek may be installed by forcing the Skeeter prop bearing assembly on, with the landing gear wire held in position on the fuselage stick. Alternatively, you could bend your own wire gear legs, and add small-diameter balsa or lightweight plastic wheels. Naturally, the fuselage stick will need to be shortened, and the lower nose piece reinstalled, to restore the correct balance. On our model, the change to landing gear resulted in the need