#601

Nickel

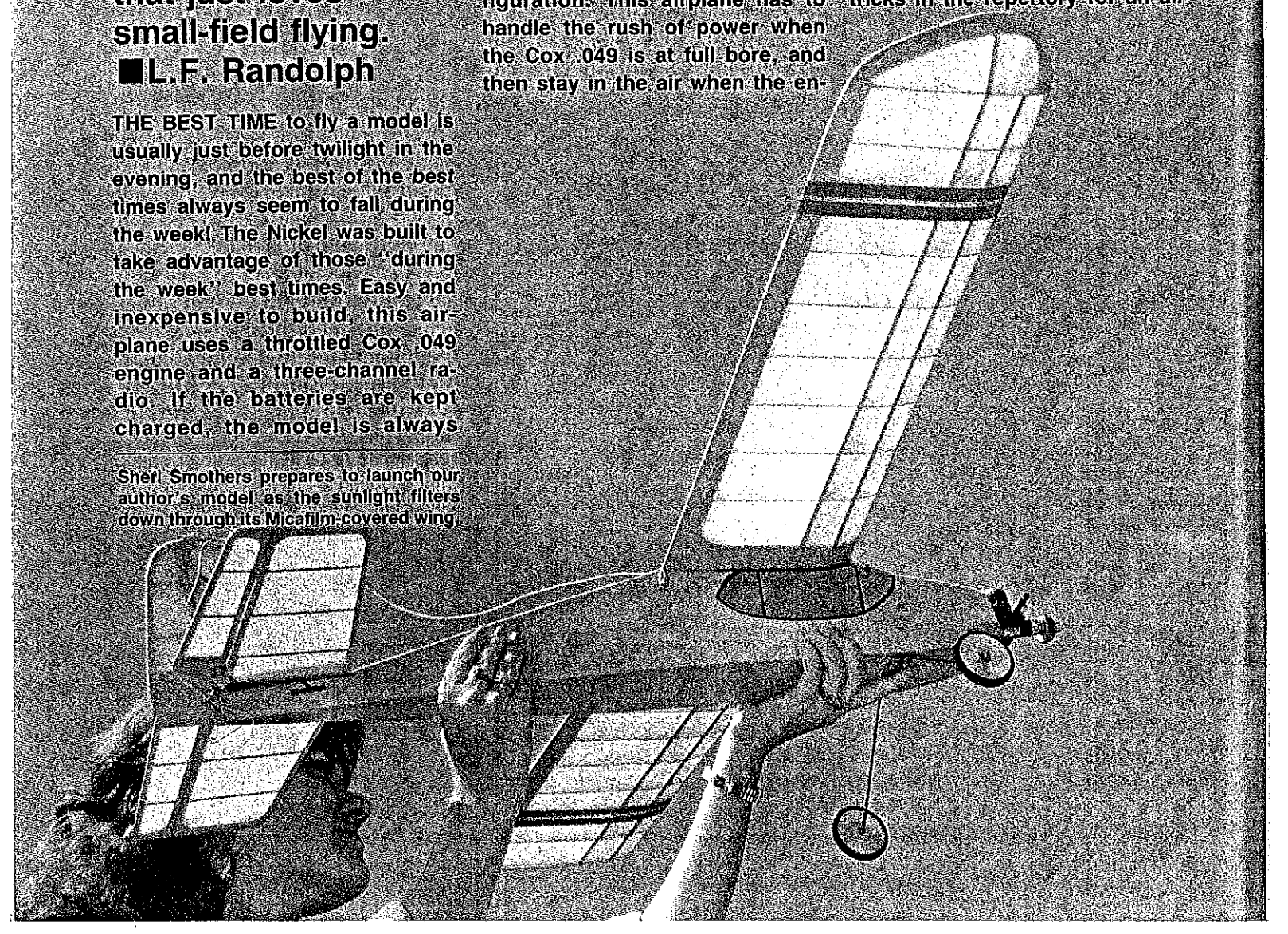
This sport design combines the Cox .049 Tee Dee engine with Ace RC's throttle sleeve for a three-channel model that just loves small-field flying.

■L.F. Randolph

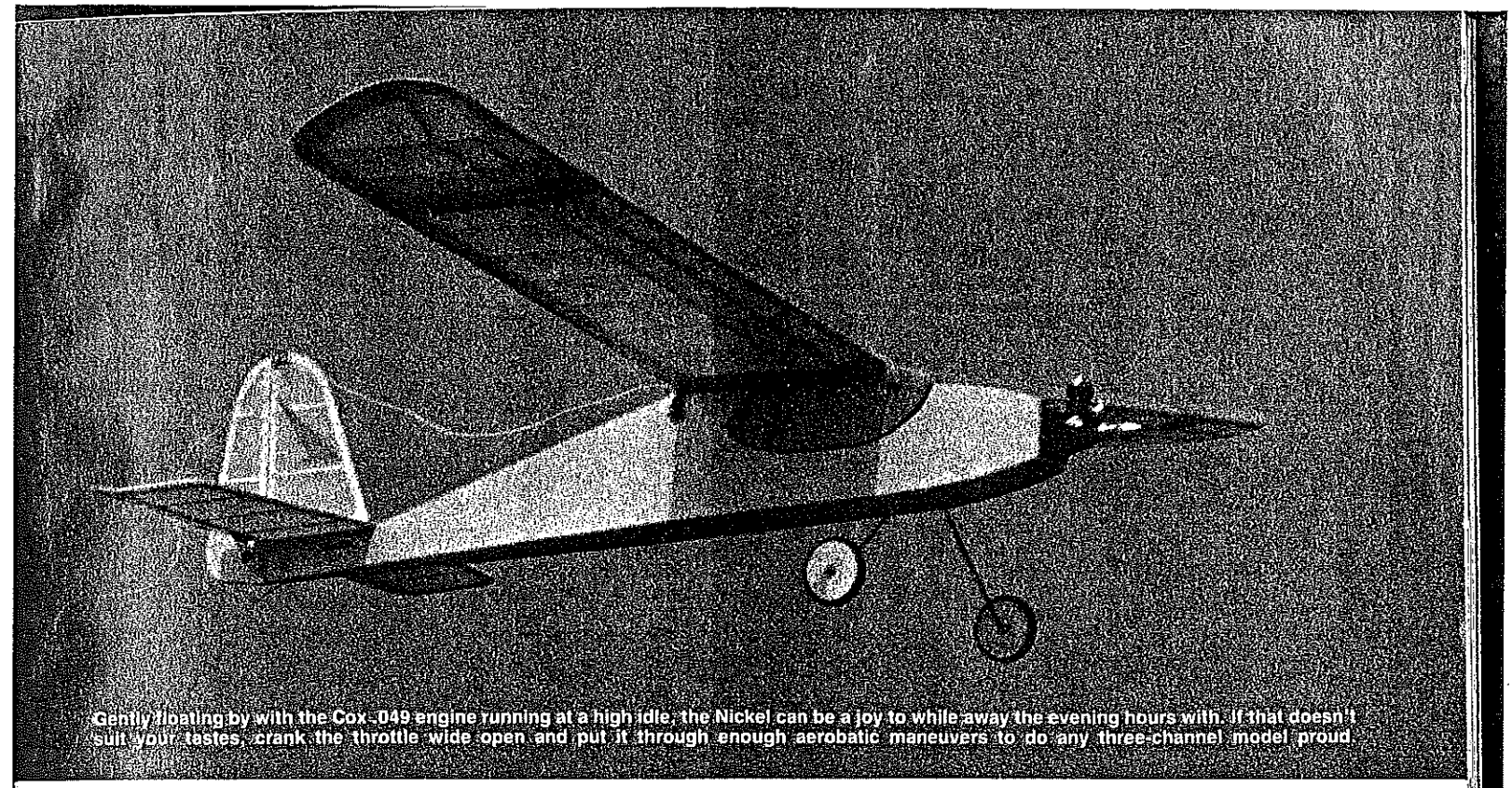
THE BEST TIME to fly a model is usually just before twilight in the evening, and the best of the *best* times always *seem* to fall during the week! The Nickel was built to take advantage of those "during the week" best times. Easy and inexpensive to build, this airplane uses a throttled Cox .049 engine and a three-channel radio. If the batteries are kept charged, the model is always ready for some after-supper flight time.

The Nickel is designed to take full advantage of the Ace throttle sleeve for the Cox .049 engine. Since that type of throttle offers little in the way of a midrange, the design must meet a unique situation—hence the unusual configuration. This airplane has to handle the rush of power when the Cox .049 is at full bore, and then stay in the air when the engine drops to a high idle. Nickel does both, and does them well!

Combining a basically light airplane and a fairly large wing provides a wing loading in the single-digit range—an absolute necessity if a wide performance envelope is to be achieved. At full power the Nickel will do all the tricks in the repertory for an air-



Sheri Smothers prepares to launch our author's model as the sunlight filters down through its Micafilm-covered wing.



Gently floating by with the Cox .049 engine running at a high idle, the Nickel can be a joy to while away the evening hours with. If that doesn't suit your tastes, crank the throttle wide open and put it through enough aerobatic maneuvers to do any three-channel model proud.

plane without ailerons, and it will do them outside as well as inside. When power is reduced to nearly nothing, the model will cruise around at practically a walking speed. Very relaxed flying, and nearly as quiet as Electrics. Reduce the throttle completely, and the Nickel will settle in for some extremely pretty touch-and-goes.

For those of you who live at higher altitudes, the Nickel gives you a chance to fly with .049 power. Give it a try, mountain dwellers! If you build one, I'd appreciate your letting me know how it performed. Better still, how can it be improved?

Wing. Since it's generally the most demanding step in the building process, I like to get the wing out of the way before building the other parts.

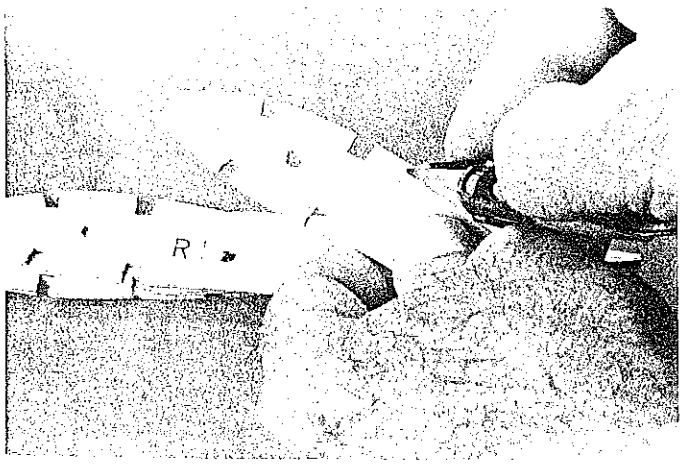
Make all the wing ribs from 1/16 sheet balsa. One method is to cut them from a printed sheet made by tracing around a card stock template with a fiber-tipped pen. Another option is to stack cut them using balsa blanks; trace the rib pattern on top and saw them out with a band saw or jigsaw. If you use the printed sheet method, stack and pin the ribs together once they are cut out, then gang sand them to smooth out any high or low places that might have crept in during the slicing.

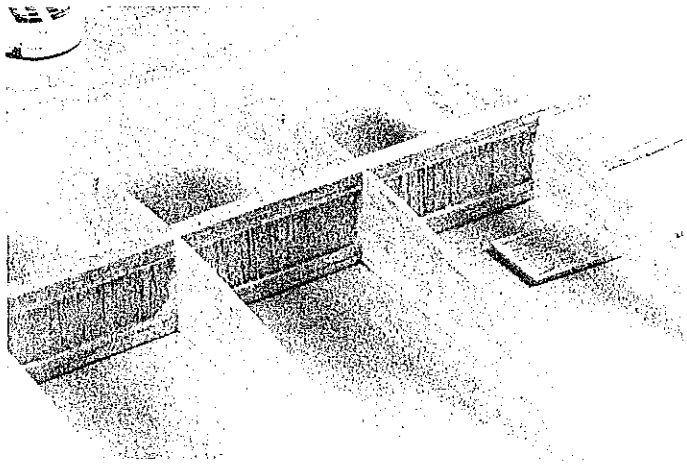
Trim 1/16 in. from the top and bottom of each of four ribs that go into the center section. Cut the webs from 1/16 sheet, making sure that the grain runs vertically. Webs significantly strengthen the spars while adding little weight.

Different grades of wood are used for specific parts, with the choice determined by how the part is used. The wing spars should be cut from firm stock, while the leading edge can use slightly softer wood. The trailing edge sheet is medium-weight quarter-grained stock. Slice the wing tip pieces from soft 1/8-in. sheet, taking care to follow the direction of the grain as shown in the plans.

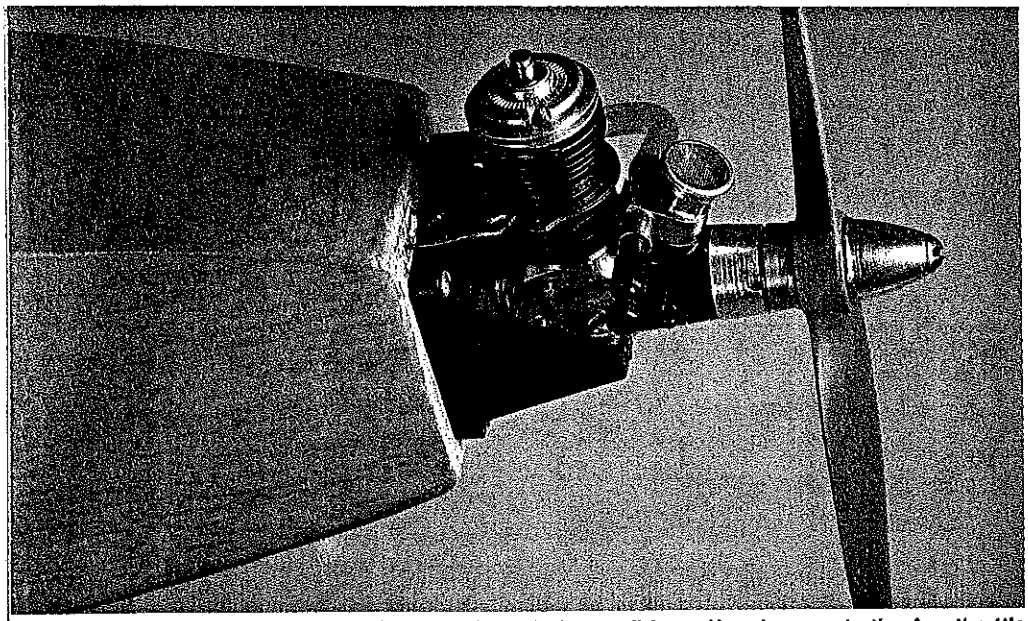
Spars can be purchased if you wish, but I recommend stripping them from the appropriate sheet wood instead. This can be done with a straightedge and razor knife, or alternatively with one of the balsa strippers on the market.

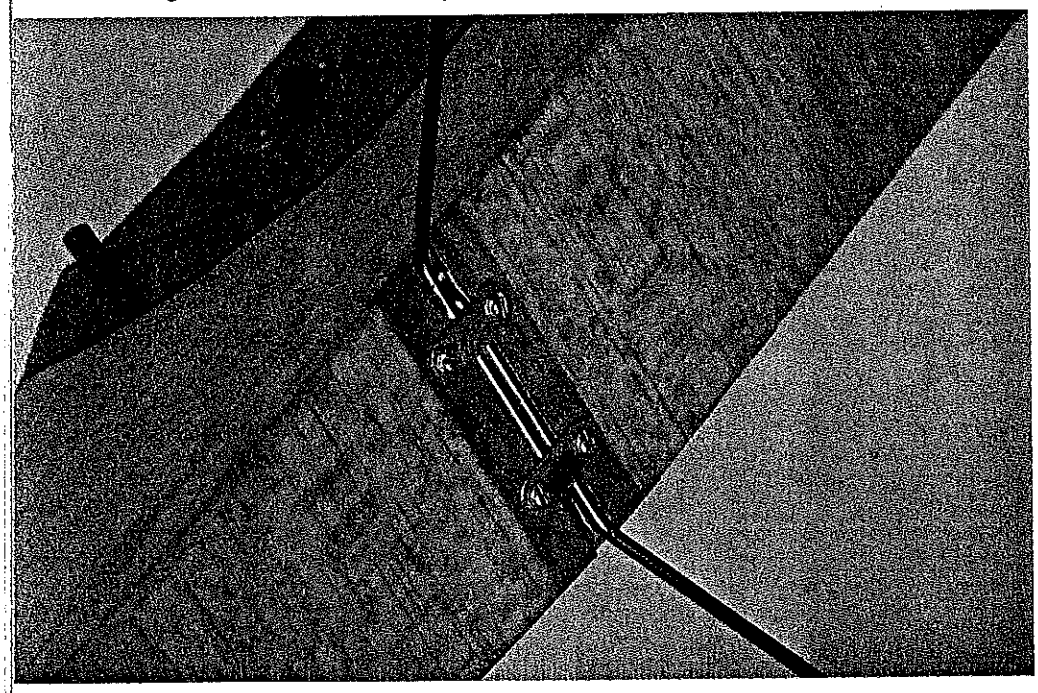
The wing is built in two halves. Cover the plan with wax paper, and pin the bottom main spar in place on the plan. Slip some of the ribs on the spar, and use them to position the trailing edge sheet so that it will be adjusted for any slight discrepancy between your rib length and that specified in the plan. Pin the trailing edge in place, and, starting with the two trimmed center ribs, glue the ribs and webs in position. When installing the center ribs, use the template to trim the web to the proper angle so that the ribs will be slanted for the dihedral.



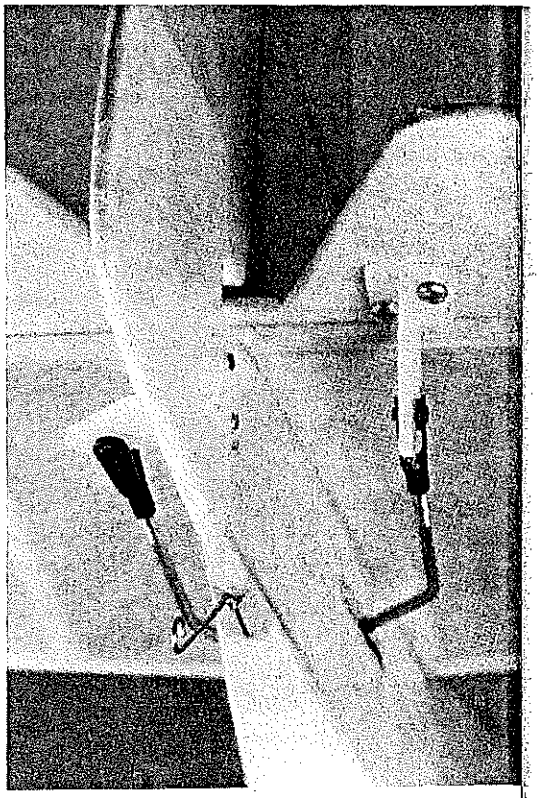


Left: Using a compass, mark the 1/16 in. to be trimmed from the four center section ribs. This is to make room for the 1/16 sheeting that covers the center section. Right: Build the wing right over the plans in the time-honored way. Note the scrap 1/16-in. shim under the center ribs.





Above: A soft iron wire that runs through the small inner Nyrod connects the Ace throttle sleeve to the throttle servo. Below: Torsional mounting of the landing gear is a simple arrangement that will take all the punishment this airplane can dish out and still ask for more.



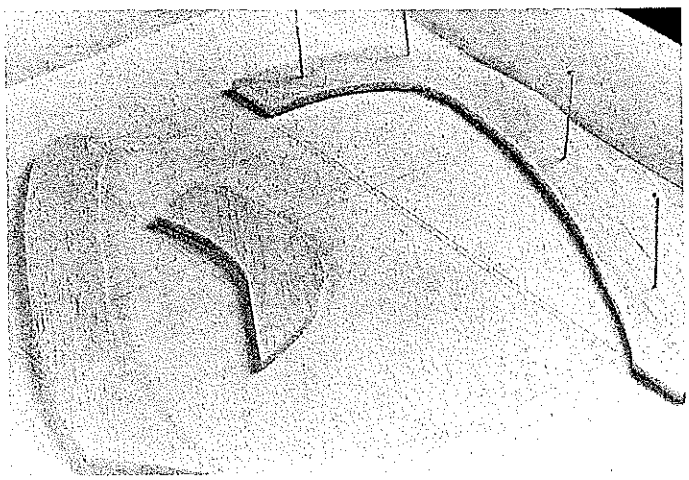
Note the control horn and pushrod exit details. A simple wire skid keeps the rudder up out of harm's way while on the ground.

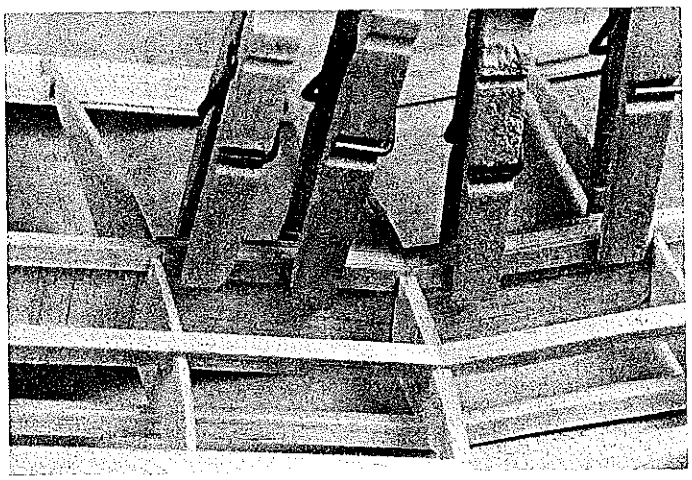
Once all ribs and webs are installed, add the top main spar. Make sure that it is glued to all the webs as well as to the ribs. The top front spar can be installed at this point, but don't add the top trailing edge sheet until the wings have been joined at the dihedral.

Build the other wing half. Follow the same procedure, but with the angled ribs at the opposite end.

Trim all spars and trailing edges flush with the slanted ribs, and cut the dihedral braces from 1/16 plywood. Using a sharp razor, slice 1/16 from the center ribs on each side of the main spars to fit the dihedral braces. Place one wing half flat on the bench and elevate the other to the dihedral angle, then install the braces. Check for fit, and glue all joints. When everything is dry, install the bottom front spar and the leading edge.

Glue the wing tips to the two tip ribs, angling them upwards till they are flush with the tip of the top spar stubs as per the plans. Use scrap spar material to shim up the bottom main spars and the tips. Add the top trailing edges and then the center section sheeting, taking care that the latter goes between the spars rather than over them. The wing is now completed and ready for sanding.

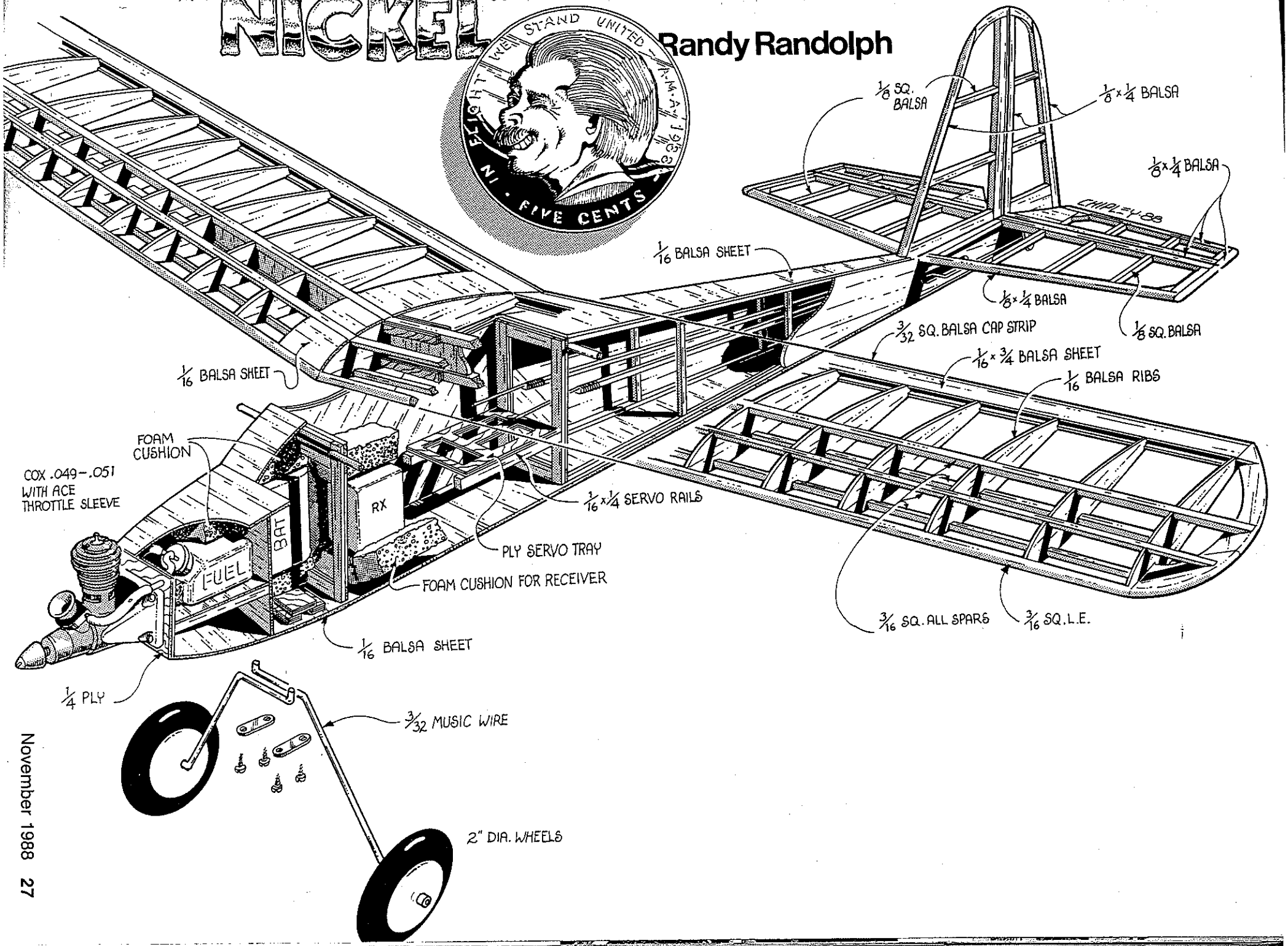




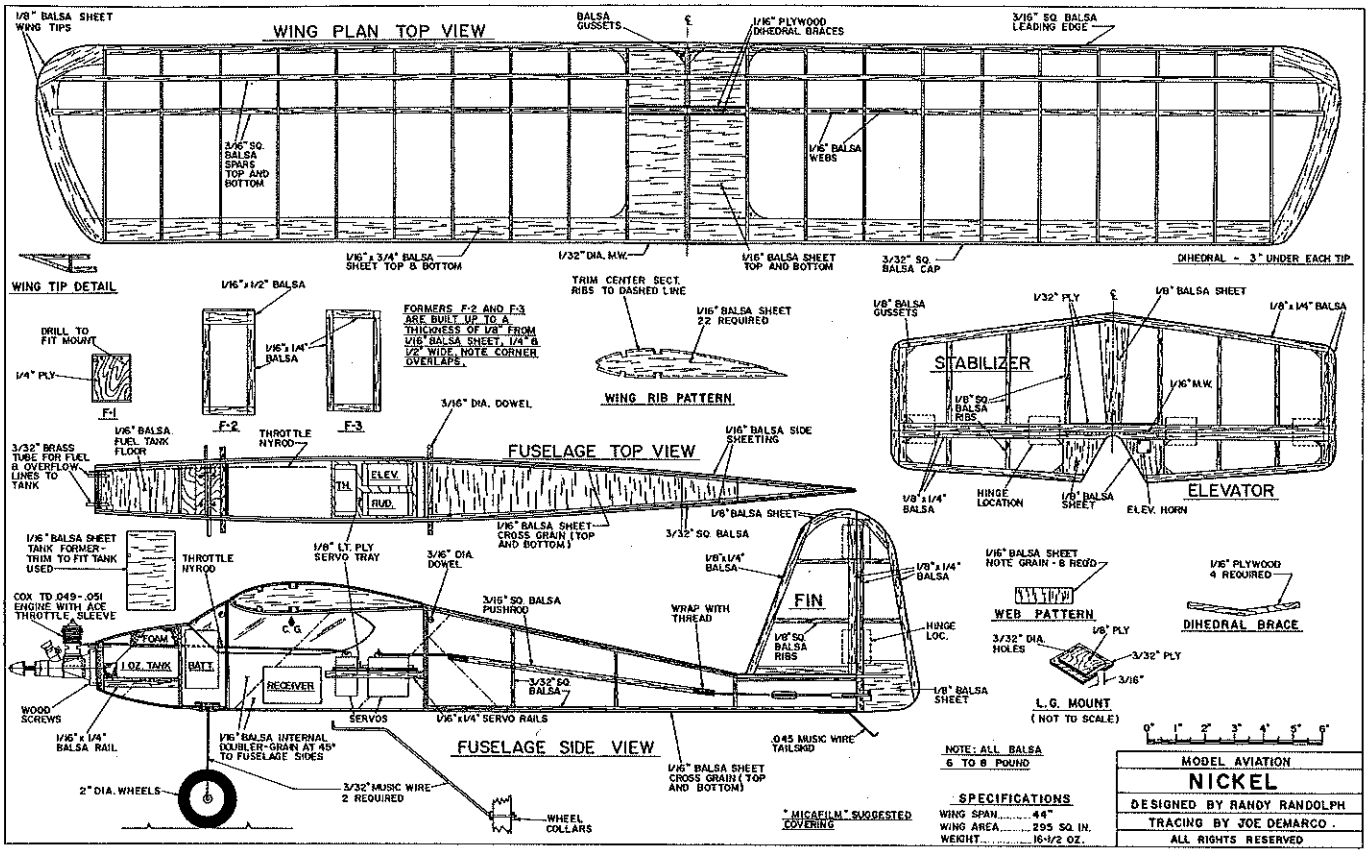
Left: The wing tips are built over the plan. They are shown actual size so they will conform with the airfoil when slanted up into position. Right: Clothespins and dihedral braces hold the wing halves together until everything can be properly aligned. CyA glue locks it all into place.

NICKEL

Randy Randolph



Full-Size Plans Available . . . See Page 186



Build the stab, elevator, and rudder right over the plan just as with the wing. Don't eliminate the two 1/32 plywood spar doublers; they add considerable strength to the stab in this area. Join the mating surfaces of the completed parts, and sand the outlines to match. Inset and epoxy the music wire carry-through in place at the leading edge of the elevator.

Fuselage. Cut out the sides from medium-weight 1/16 balsa sheet. Don't cut the wing saddle into the sides until after the doublers are glued in place. Cut the doublers from 1/16 hard stock balsa, and position them with the grain at a 45° angle to the grain of the sides. After cementing the doublers in place, pin the two sides together and shape them to an identical outline with a sanding block and 100-grit sandpaper. While the doublers are still pinned together, cut the wing saddle and drill 3/16-in. holes for the wing holding dowels.

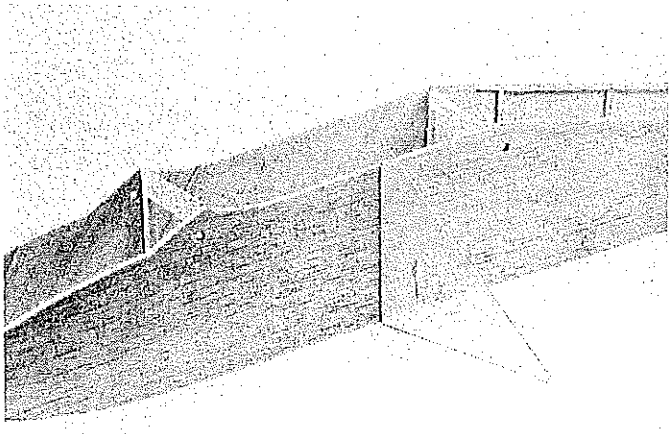
Separate the doubler sides, and add the 3/32-sq. uprights as well as the servo and the the tank mounting rails. Cut out and drill the firewall and the two cabin formers, and epoxy 'T' nuts on the backside of the firewall for the mounting bolts.

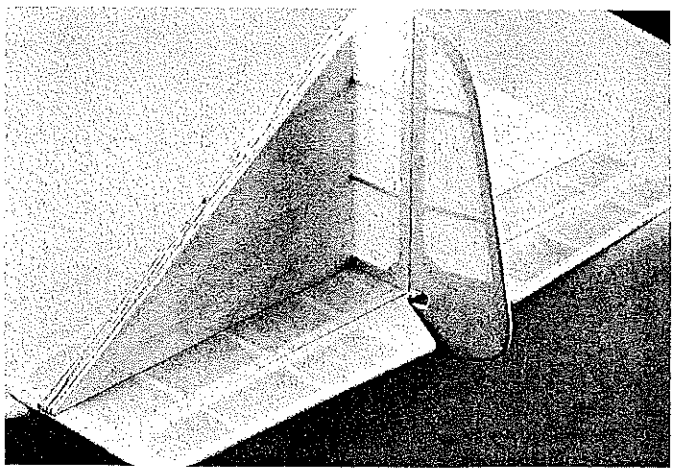
Begin assembly by gluing the two cabin formers in place on one of the fuselage sides. Check with a right triangle to make sure the formers are perpendicular to the side. When dry, glue the other side to the formers, making sure the two sides are in perfect alignment. Draw the tail halves together, and glue. When the glue has set up, mount the firewall. It's a good idea to use epoxy to hold the firewall in place.

Build up the landing gear mount, and glue it in place just in front of the first cabin former. Sheet the bottom of the fuselage with 1/16 balsa, checking that the grain is running horizontally across the fuselage. At the very tail the balsa is replaced with 1/16 plywood for the tail skid mount. Epoxy the 3/32-in. brass fuel tube and the overflow lines through the firewall. Do the same with the throttle line. Install the floor in the tank compartment. Wedge the tank in place with foam, and connect it to the brass tubes with fuel tubing. Watch for and eliminate any kinks in these lines. Finish the cross-grain sheeting, and sand the completed fuselage.

Covering and finishing. The prototype was covered with Micafilm, which worked very well. Follow the manufacturer's instructions for application. Hinge the sur-

Continued on page 141





Left: Before the glue sets on the cabin formers, place the fuselage on a flat surface and check that it is square. Not the diagonal grain on the inside doublers. Right: The rudder and elevator are covered and joined before final installation on the fuselage. Make sure they are square.

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Safety/Preston

Continued from page 20

I'm going to finish right here because tomorrow I leave for the AMA Nats, and when I return I will have to write a column on the RC Scale events (which you can now turn to on page 42 in this issue).

Have another safe month.

Nickel/Randolph

Continued from page 28

faces using whatever method you're most familiar with.

Trim the covering away from the stab where it contacts the fuselage on the bottom and the rudder on the top. Epoxy the fin and rudder to the top of the stab, checking alignment with a square, and then epoxy the stab to the fuselage. Trim the covering away, then epoxy the 3/16-in. wing mounting dowels in place. Epoxy the tail skid to the 1/16 plywood mount.

The engine mount is attached to the firewall with wood screws. Before doing so, harden the screw holes with thin CyA and paint the firewall with a coat of epoxy. Once the engine is mounted, attach the fuel line to the carburetor, then run a piece of soft iron wire through the throttle Nyrod to connect the latter to the throttle arm. Bend the landing gear legs, add the wheels, and install the units in the gear mount with metal brackets and small wood screws.

Check that the plane balances at the point indicated in the plans, moving the battery pack and servos around as necessary. Install the radio, and recheck the balance point. Connect the elevator and rudder to the servos with pushrods made from soft 3/16-in. balsa as shown. Make a 'Z' bend in the throttle wire to engage the servo. Satisfy yourself that everything reacts properly to the transmitter controls, and do a range check. With that accomplished, your airplane is ready to fly.

Flying. Since the prototype has so far only been acquainted with rough and weedy

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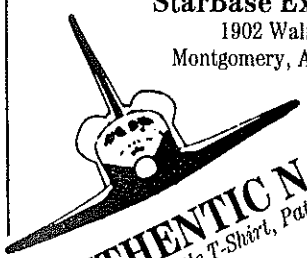

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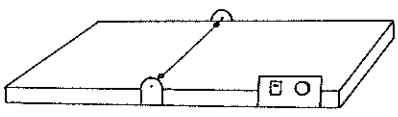

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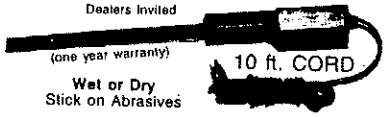

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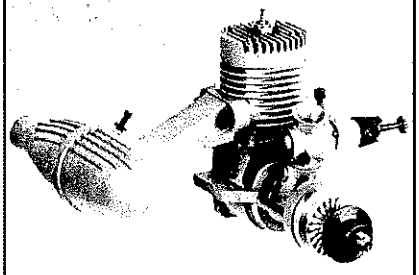

SPECIFICATIONS	
BORE	.650
STROKE	.600
DISPLACEMENT	.199
WEIGHT	8 oz.
RPM with 8-4 prop	17,000
FUEL CONSUMPTION	.4 oz./min.

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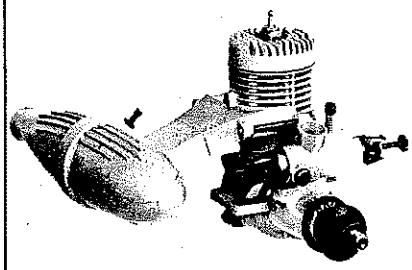
Fox 25



SPECIFICATIONS	
BORE	.680
STROKE	.680
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FUEL CONSUMPTION	.4 oz./min.

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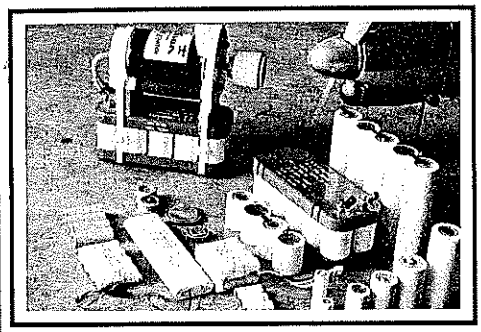

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fields, most of the time I've flown her from a hand launch. Actually, not much of a throw is required to get the Nickel on its way. A wings-level, nose-on-the-horizon baseball pitch does the job quite well.

Once she's in the air, trim the Nickel for level flight at full throttle. In this configuration, low-speed trim will still be well within range of the trim lever on the transmitter. The performance envelope will surprise you. Control response is positive and solid, like that of a much larger airplane. The Nickel's combination of light wing loading and throttle control lets the flier range from an almost straight-up climb to a quiet cruise—from fast and peppy to slow, gentle, and sedate.

Rolls aren't as smooth as with an aileron-equipped model—this is a rudder airplane, after all!—but they unmistakably are *rolls*. Inverted flight is smooth and easy, even at reduced throttle, and outside loops are just as tight as inside ones. During taxiing, the rudder is quite effective for directional control without the need for a tail wheel. Finally, on a smooth field you can have great fun putting the Nickel through touch-and-go maneuvers.

The next time that after-supper urge to go flying strikes, you couldn't take along a better bet than a Nickel. It's the perfect anodyne for those middle-of-the-week jangled nerves—fun, versatile, and maybe even a little daring. This model keeps you alert, on your toes, and ready for more fun. And what it does for me, it can do for you—help you make those *best* times even better!

Nats General/Worth

Continued from page 33

if necessary, but finished in the time scheduled.

RC Scale events provided the grand finale to the Nats model flying. They flew four rounds over two days and could have flown a fifth round, but everybody seemed to have had enough—considering the heat—so Scale finished at about noon on the last Sunday instead of several hours later.

Control Line enjoyed good site situations, including grass for Combat and smooth runways for Precision Aerobatics and Racing events. Speed and Carrier events had separate and adequate locations which, though not ideal, were well accepted by most contestants.

All in all it was a fine Nats (aside from the Outdoor Free Flight cancellation), so once again another National Model Airplane Championships is in the history book. For next year there are currently three site possibilities: Tacoma, Washington; Amana, Iowa; and Muncie, Indiana. Explorations of these site possibilities were actively underway after the Nats toward the end of announcing the selection by November of this year—the AMA Executive Council is expected to decide at its October 22 meeting in Reston, VA.

Meanwhile the memory lingers on concerning how the annual miracle of the National Championships was accomplished. It is a blur of hundreds of faces and names who made it possible—too many to list here. But several groups can be credited: *Continued on page 144*

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