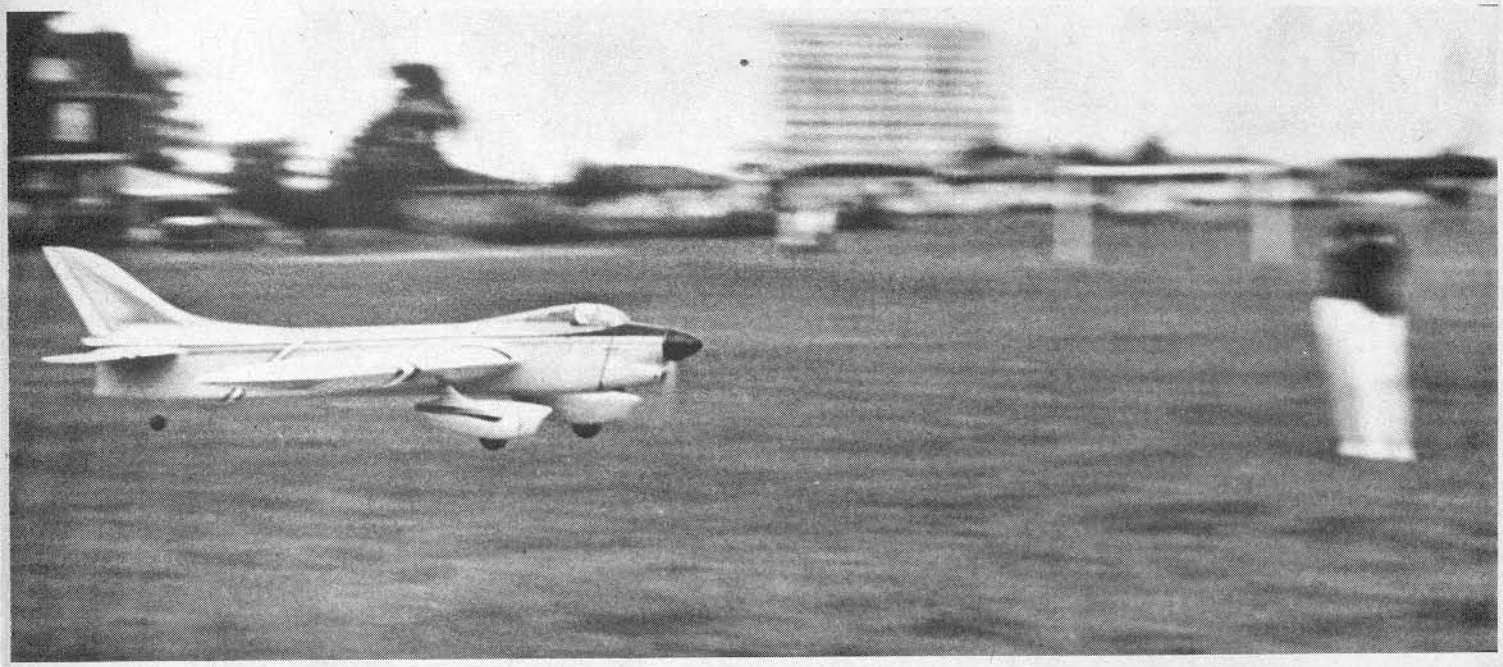
NOVI

By DAVID GIERKE

'A light, eye-catching, sleek design was essential.' A truly exceptional stunter for Fox 35 or Mac 40.



Smoooth! The right ship minimizes "gamesmanship . . . there is too much acting and not enough flying in stunt."

Andy Granatelli, famed Indianapolis racing driver, coined the name Novi for his high powered machine which has never finished in the "Brick Yard" in nearly a quarter of a century. Andy explains that his unique name comes from the town where he was born. It seems that in the days of the Texas stage coach lines the town had no name, but was merely stop Number 6. By abbreviating number to No. and using the Roman Numeral VI, Andy's hometown became known as Novi Texas.

Subsequent to meeting George Aldridge, who ran the stunt event at the Dallas Nationals in 1964, I became aware of one of the most decisive factors in stunt flying, namely the weight of the craft. My Nobler, a ship which almost every model flyer has owned at one time or another, had 523 squares and weighed an unbelievable 54 oz. George just winced when my yellow monster crawled up on the scales.

Author buffs finish to polished sheen. Make your target about 50 oz. for a 35.

There is a lot of truth about the overweight stunt ship not flying a good pattern. No other single factor contributes more to the failure of a design than overweight. Warps, built in mistakes of alignment, may be corrected by proper flight trimming. But nothing short of pumping helium into the wings will produce efficiency in an overweight ship.

After qualifying in 1964 for the finals at the Dallas Nationals and placing 11th, it was apparent that a light, eye-catching, sleek design was essential.

There has been much discussion about bolting a larger engine in an overweight ship. I have concluded that the basic catch lies with the wing loading, not power loading. It is the wing and its loading which determines maneuverability. Power loading only gives problems when it ranges higher than 140 oz. per cu. in. displacement. I have found that a wing loading of more than 13 oz./sq. ft. means trouble, no matter how favorable the power loading. This means that you had better not build the Novi to weigh more than 53 oz. with the present wing area. The original weighs 50 oz., powered by a Fox .35. If you plan on having a ship heavier than 50 oz., move the displacement to .40. McCoy now has an excellent stunt .40. It should be noted that the above material has been accumulated through trial and error and is merely a generalization based upon my personal flying tastes.

For a period of four years until the 1964 Nats, I "pranged" one ship a year because of mechanical failure. My difficulties really ran the gamut, from line breaks (always up), to pushrod snaps, bellcranks wearing out, and broken control horns.

Looking back over those failures, I remember one fault with all of them. In addition to being heavy, there was not sufficient time spent with control installation and design. Bellcrank and horns were not bushed; leadout holes in the crank were not bushed; the pushrod did not have the proper number of fairleads installed; and the control horns, flap, and elevator were

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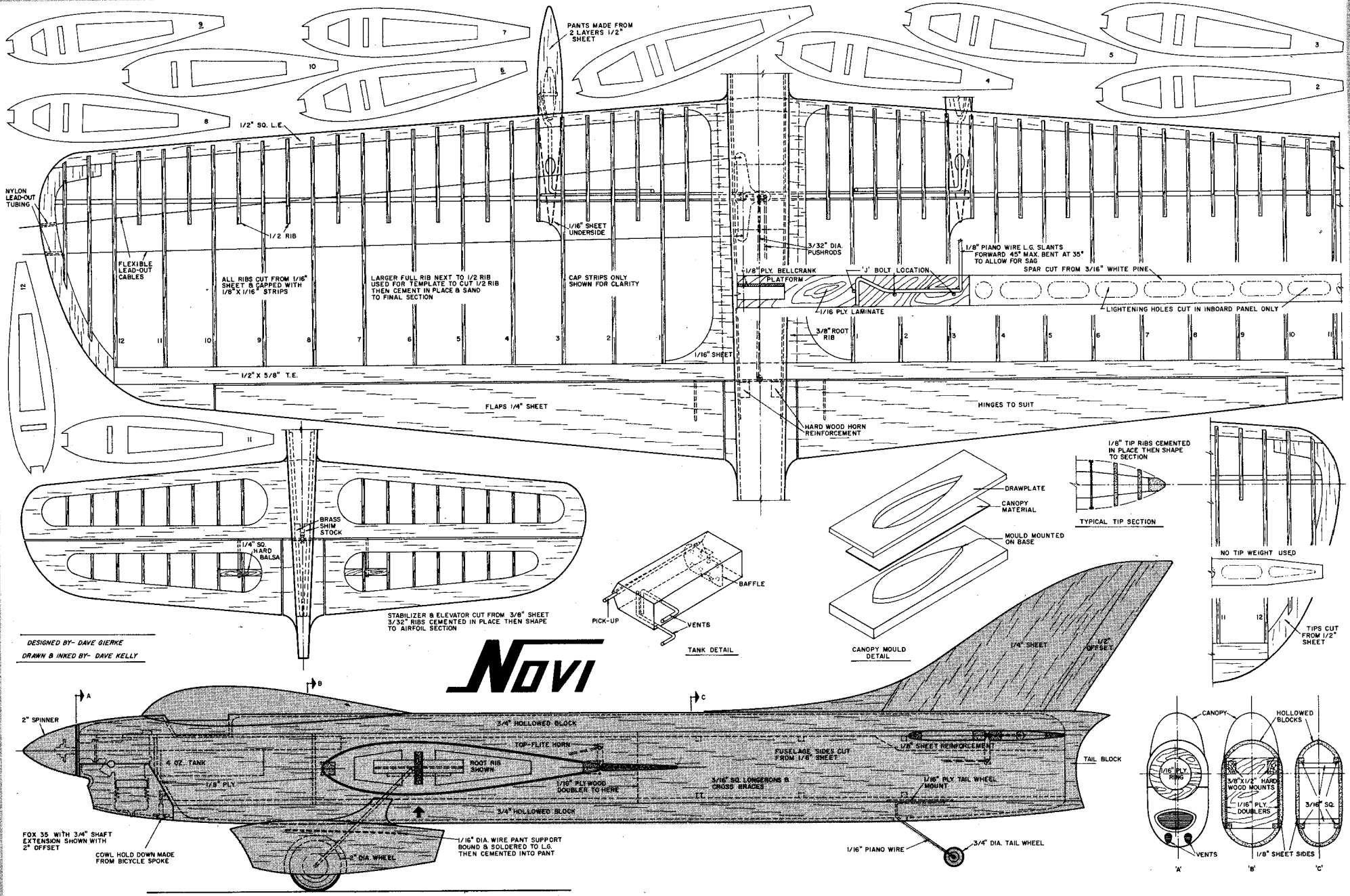
Nancy Gierke shows off hubby's dreamship. Dave really details finishing procedure.



FULL SIZE PLANS AVAILABLE—See page 56

Novi

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not secured from moving up and down on the trailing edge of the wing and stab which caused breakage or rapid wearing of inboard hinges.

For my solution to the bushing and securing problem of the control system, check the drawings. Proof of their reliability lies with the number of flights on Novi. To date there have been more than 200 flights logged with no sign of wear.

Note the landing gear set-up. There is no tricycle gear, the reason being that the torsion bar in the wing provides an almost bounce-proof landing system. There will be some who won't believe me, but I have bounced Novi only once in over 200 flights! The one bounce came in Detroit after the Chicago Nats. The ship taxied around into the wind after a perfect touchdown and lifted off again due to my failure to hold down the elevator. No matter how the ship is landed—hot, slow, stalled in from a foot, it will not bounce as long as you hit down elevator as soon as ground contact is made.

Construction began in preparation for the Willow Grove Nationals during the month of May. The late start was due to my winter ship (an airliner configuration) failing to pan out. I used the I-Beam method of construction for three reasons: quick assembly, foolproof alignment, and relative warp-proofing due to jigging.

Wing flex, particularly in the wind, was a problem to avoid. I tried a clear white pine spar with 1/16" plywood laminated to the center section. However, it weighed 2½ oz. more than the conventional balsa I-Beam. Lightening holes were then drilled the entire length. The result was an I-Beam which had superior strength with the addition of slightly more than 1 oz. total weight. Ten days were spent with the finish, which I consider to be your most useful asset in attracting favorable opinion from judges.

On the 16th of July, a mere week from the Nats, the first test flights were made. To my astonishment, Novi flew right off the bench, with no adjustments necessary!

On the first flight I performed the entire stunt pattern.

Six flights were put on Novi that first evening, each feeling better than the previous one! Run the engine a bit faster; line tension everywhere on the square eights; line tension vertical and overhead; tank-run just over seven minutes; let it land itself. I must admit sleep was a bit hard coming by the 16th of July, and it wasn't because of the heat! I couldn't believe the stunt job I had on the end of 62½-ft lines that night was real! It was in six short flights the best thing I had ever flown. You have known this feeling?

All didn't go well for the remaining days, however, because it rained and was windy. As a result we headed for Willow Grove with six short flights under my belt. Although open stunt qualifications were not until Thursday, time was growing short. Monday was spent registering. Monday evening and Tuesday morning we spent polishing Novi with a buffing wheel and polishing compound.

On Tuesday afternoon six more flights were added and a problem arose. It seemed as though I had tank problems because I couldn't get a steady engine run. The Fox started out each flight running at an even four-cycle breaking into the desired two-cycle. Only one thing was wrong here. It wouldn't come back to the four-cycle. After playing games with the glow plug, fuel filter and fuel lines for most of the afternoon, Jim Silhavy gave me one of his O.S. Max needle-valve assemblies. This did the trick and that problem was solved. On Wednesday, the day before qualifications, we made ten more flights and I called it quits. There is a point where you go "flat" and no amount of practice thereafter will help.

With 22 flights on the ship, we went into the appearance point judging Wednesday night. There were 87 entries in Open Stunt. Champions, former champions alike, too numerous to mention, were in line to be processed. The spectacle was almost frightening.

The next day, Thursday, was the culmination of many months of work and practice. Not to qualify meant to return home and plan for Chicago. Qualifying among this elite group would be worth more than the total effort. As things turned out, I qualified for the finals in fourth position. I could have gone home right then and there, and been more than happy, just to qualify as highly as I did, with a new and largely improved ship.

Finals day resulted in Bob Gialdini winning the overall honors on a very creditable performance. I placed tenth with Novi in rather windy conditions on our 27th flight.

Since Novi's first competition at the 1965 Willow Grove Nationals, we have entered

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nine other contests including the 1966 Chicago Nationals. Of the contests entered, Novi has placed first on five occasions including the Canadian Nationals twice and the Canadian National Exhibition for two consecutive years. Also we have placed second two times, and third once.

Finishing has been my favorite area of endeavor for many years. Accurate information has been scarce. I switched, some years ago, to the spray gun. Here are a few advantages of spray painting: 1) ease of application, 2) small amount of butyrate (weight!), 3) even coverage, 4) uniform color.

The following is a step-by-step procedure on my method of spray finishing.

Structure and Undercoat: Sand structure carefully with #400 grit wet or dry sandpaper. Apply two coats of clear dope, sanding between with #400. Cover with medium weight silkspan the fuselage, wing, stab and elevator. Apply with brush seven to ten clear coats of clear dope to the entire surface (unthinned Aero-Gloss). Sand with #400 (dry) after the fifth, and each succeeding coat. Apply all fillets (Aero-Gloss Plastic Balsa).

Applying plastic balsa *over* the silkspan and dope in one thick coat, using plenty of thinner, prevents most "lifting" which is caused by the unequal tensions otherwise produced. Sand all fillets using #100 garnet paper. Using the index finger, rub two coats of Aero-Gloss C-77 cement into the surface of the sanded fillets. Sand between each coat (#400).

Apply two heavy coats (flow them on) of Aero-Gloss Balsa Filler. Coat entire airplane. Sand with extreme care after each coat. A good method of checking your work is the reflection of light off the work surfaces. If any shiny spots or "pin-holes" appear, it indicates a low spot which must be sanded out (if enough filler remains) or it must be refilled. Note: This is the most important single phase of the finishing procedure, and much care and patience should be taken. A total of eight working hours were spent sanding Novi's two filler coats.

Base Color: Wipe entire model down with either Dupont "Prep-sol" or Martin Senour "Kleenz Easy." This removes all grease and dust.

Choice of Color: Light colors (white, gray, light blue, light greens, etc.) are the most forgiving. They don't show flaws nearly as much as dark colors. Dark colors (black, deep blue, maroon, dark green, etc.) show mistakes more readily, but have a much deeper gloss than any light color. Metallics (green, blue, silver, etc.) are very difficult, and require an almost flawless base in order to obtain desirable results.

Suggestions: If you are attempting your first *good* finish try one of the light colors. If you are a patient experienced builder, you could probably handle the dark colors easily; for the perfectionist, shoot the works —metallic. Thin colored dope one-third thinner to two-thirds pigment. (*Note*: All figures are based on Aero-Gloss dope and thinner because of minimum shrinkage. Shrinkage causes unseen flaws to appear after a few weeks, *i.e.,* balsa sheeting butt joints.

Keeping the thinner content down when spraying insures minimum penetration into the filler. Spraying should not be attempted when the humidity is above 85%. A milky white film will appear, known as "blushing." Water is trapped under the dope. When spraying in a humidity of less than 50%, *retarder* should be added. Retarder prevents the dope from drying before it hits the surface. At 50% humidity approximately a teaspoon of retarder should be added to each mixed quart of dope; a fairly good rule—for every 10% of humidity below 50%, add an additional teaspoon of retarder, or until the paint hits the surface and "flows." Retarder may be bought at most any local airport where Butyrate dope is sold.

Application of Pigmented Base Coat: Conditions—dust free room, 65-75 degrees room temp. Always strain paint before pouring it into pot of spray gun—use a commercial strainer or a silk or nylon stocking. Spread newspapers over the work surface. Tape them so they will not blow about. Place aircraft upside down and work bottom first (landing gear supports wet paint when finishing the top).

Quantity Needed, One Pint Unmixed: Adjust the fan (spread of paint particles) down to about 2 in. and spray all edges with two coats: leading and trailing edges of wing, stab and elevator; flap and elevator hinge line; edge of rudder; cooling vents, etc. Readjust "fan" to approximately 5 in. dia. and apply enough paint to uniformly cover the entire bottom of ship. (No need to pile the paint on here, as will be explained.) Carefully turn the ship over onto its landing gear and repeat the procedure to the top surface.

Trim design: The simplest solution for this type of aircraft is to follow some military style of trim and color. A second method is to devise an original trim and color configuration which is both pleasing and colorful to the eye. The most common problem here has to do with overdoing the job. Overdoing includes complicated trim design and poor color combinations.

A few trimming tips may be helpful: Keep a basic trim design simple. Have the basic trim color complement the pigmented base coat, *i.e.,* base color mist green; trim

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color, dark metallic green and black. Try to arrange your fuselage trim parallel to the thrust-line on the sides in stripe or similar configuration. (A stunt ship can show off good square corners to advantage, if the judges are given a reference line for comparison.) Try to establish a point of visual interest, other than basic trim and color design, *i.e.,* red, white and blue (rather patriotic) stripes located on the wing, stab, and fuselage of Novi. Add scale-effect detail: flap, rudder, elevator etc. control details: wing walks, access hatches, also detailed lettering such as Eject, Seat; Beware-Jet Intake; Danger-Jet Exhaust.

Application of Trim: Mask the base trim areas (Scotch Brand masking tape, ½ in. wide.) Seal the tape with one coat of clear done (prevents trim color from seeping under). Apply trim colors with brush or air-brush. (All metallics should be applied with an air-brush or spray gun.) Allow trim to dry a minimum of two hours before removing tape in order to obtain clean, sharp edges. Apply *all* other trim and details.

Pressure Sensitive Letters: Applied with soft lead pencil. Available from approx. 1/16-15" (ht.) No "decal edge." For information write New Style Signs, Ltd., 569 King St., West, Toronto 2B, Ontario, Can.

Wing Walks: For realism, contact cement a strip of #400 wet or dry sandpaper to the wing. Mask all but 1/32" of the perimeter so that the clear dope may seal it down permanently.

Application of the Clear Overcoat: With the spraying of clear dope over the entire ship, the painting is complete. The overcoat provides high gloss and visual depth. The same steps should be followed for applying the clear as were for the color coat. *Note*: If the clear does blush, don't be alarmed, it will polish out. I usually apply at least *one* unthinned quart of clear over the entire model. Don't expect the high gloss to appear yet. After drying, the finish must be sanded (#600 wet or dry) and polished. If you have the time, allow the completed job to age (complete its shrinkage) before sanding—approximately three weeks to one month.

Sanding and Polishing: Care should be taken when sanding (#600) the clear to an even dullness—especially the wing is easy to sand through. A good practice is not to sand at all on the ribs and half-ribs. *Note*: The degree of fineness in the final product is again dependent upon how well the above is performed. Take your time (4-8 hours).

Polishing to the highest degree involves a very fine compound (Dupont #7 Polishing Compound) and a wool buffing pad mounted on a polishing machine (¼" electric drill). Although the full speed of the drill may be used, a variable Rheostat is advisable to prevent surface burning. Mix the polishing compound with water to a consistency of heavy cream. Spread the mixture onto the surface holding the pad at an angle of 20 degrees to the surface. Work a small section at a time, applying *no* pressure to the wheel. *Caution*: Watch the direction of rotation. Don't "hook" a flap or stab. Now that you have finished the difficult part, apply any good paste wax to the surface. Be sure the wax contains no cleaner agent.

Two Closing Ideas: Pull your own canopy, to desired size and shape. Use acetate-butyrate plastic 20-30 thousandths thick (plastic supply house). *Note*: Oven—250 degrees F., approximately three minutes. Cut female shape 1/16" larger all around, allowing clearance. See drawing for further specifics. Tint canopy to your desired color and shade—any clothing dye (analine) such as RIT. Pour the contents of the package into a bowl which contains about one-half gallon of hot tap water. Immerse your canopy in the solution for about five minutes, then check for color. If the color is too light, try it for a longer period.

In closing, I would advise the builder to watch the center of gravity. Adding or subtracting nose weight will noticeably change the turning characteristics of the Novi. A smooth, groovy corner should be the desirable result. I would encourage the stunt modeler to consider the material presented with an open mind, focused upon the idea of refinement and overall knowledge obtained through my research.