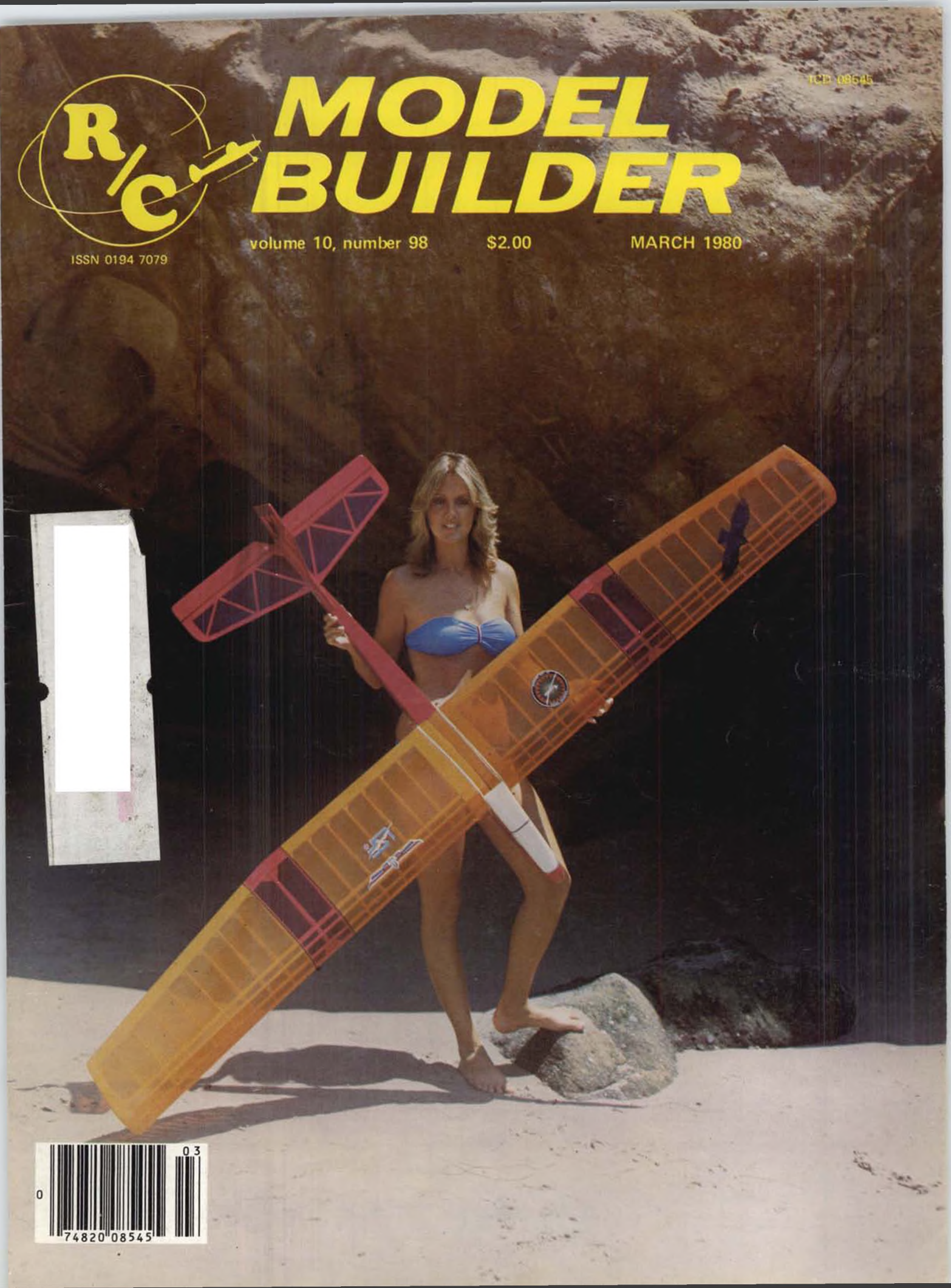
R/C MODEL BUILDER

ISSN 0194 7079

volume 10, number 98 $2.00 MARCH 1980



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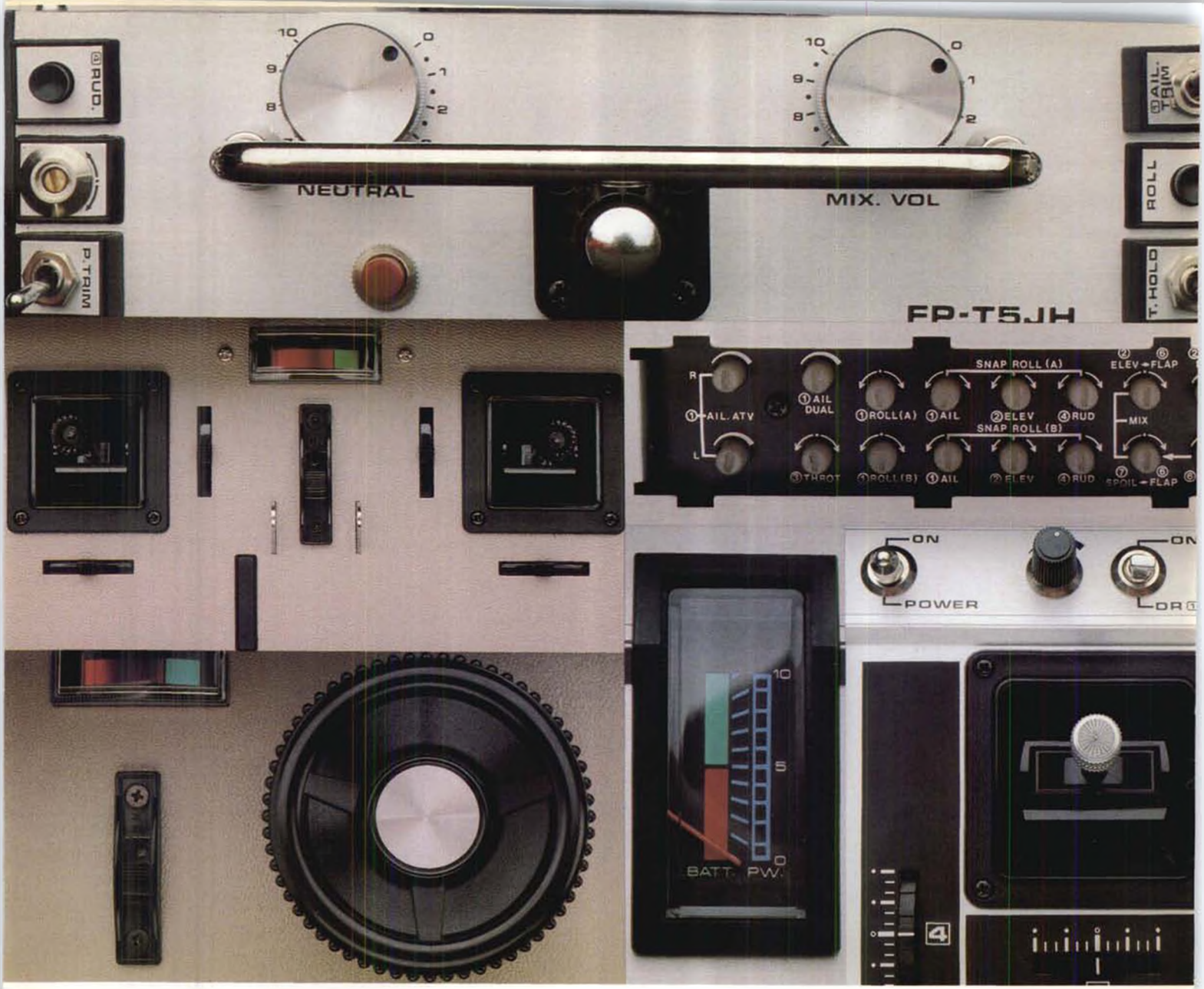

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R/C MODEL BUILDER

MARCH

1980

volume 10, number 98

621 West Nineteenth St., Costa Mesa, California 92627 Phone: (714) 645-8830

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SCALE VIEWS

CONSTRUCTION

Cover: Just never know what you'll find in the Balboa Bay area of Newport Beach, California! In this case, it's Nina Downing and a Big Birdy. The sailplane was built from a Bridi kit by Willy Richards, of Compton. Nina is just **BUILT**. Photo by Chip Conklin.

R/C MODEL BUILDER (ISSN 0194 7079) is published monthly by RCMB INC., 621 West Nineteenth Street, Costa Mesa, California 92627. Phone (714) 645-8830.

Subscriptions $20.00 per year, $37.00 for two years. Single copies $2.00. Add $3.50 per year for postage outside the U.S. (except APO and FPO).

Change of address notices must be received six weeks before date of issue that new address takes effect. Send old address with new; old label preferred. Post Office will not forward copies unless you pay extra postage. Duplicate issues cannot be sent.

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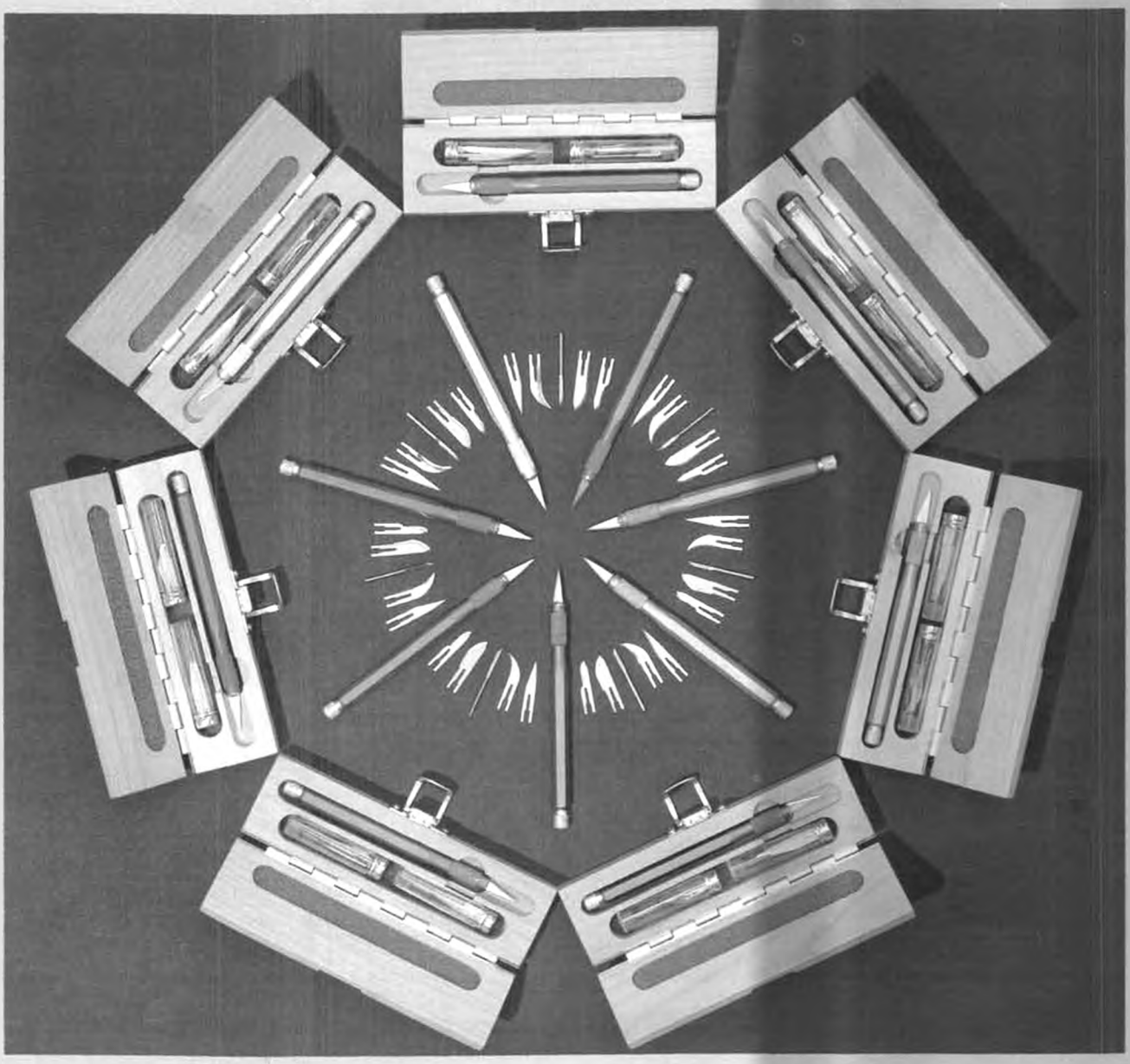
IN THE BEST CIRCLES, IT'S **über skiver**



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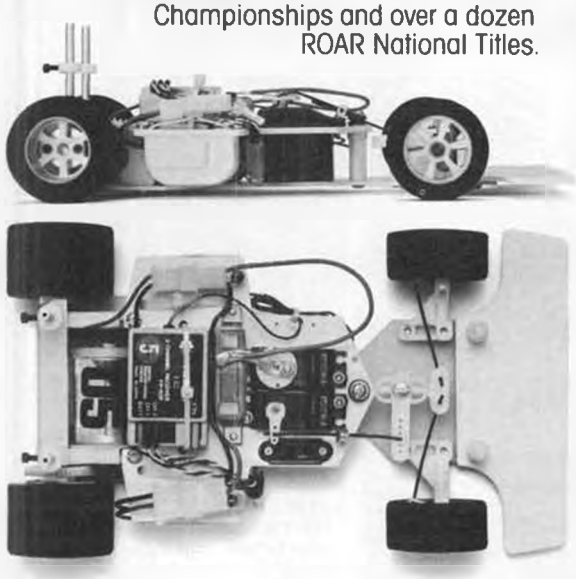

The Nats-winning RC12E features die-cut fiberglass chassis, lightweight racing wheels and tires, tough glass-filled nylon pillow blocks and complete, detailed instructions including racing tips from Gene Husting and Roger Curtis. Approved for ROAR competition

THE RC12E'S TRACK RECORD AT THE NATS

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	6cell	No event	**RC12E**	**RC12E**
1979	4cell	No event	**RC12E**	No event
	6cell	**RC12E**	**RC12E**	**RC12E**

*4 cell cars run indoors, 6 cell cars outdoors. Chart shows all expert class main events under official ROAR sanction since the RC12E was introduced

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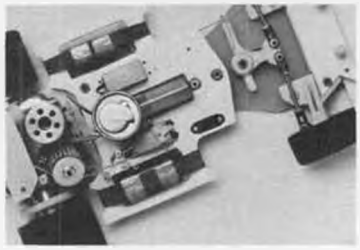

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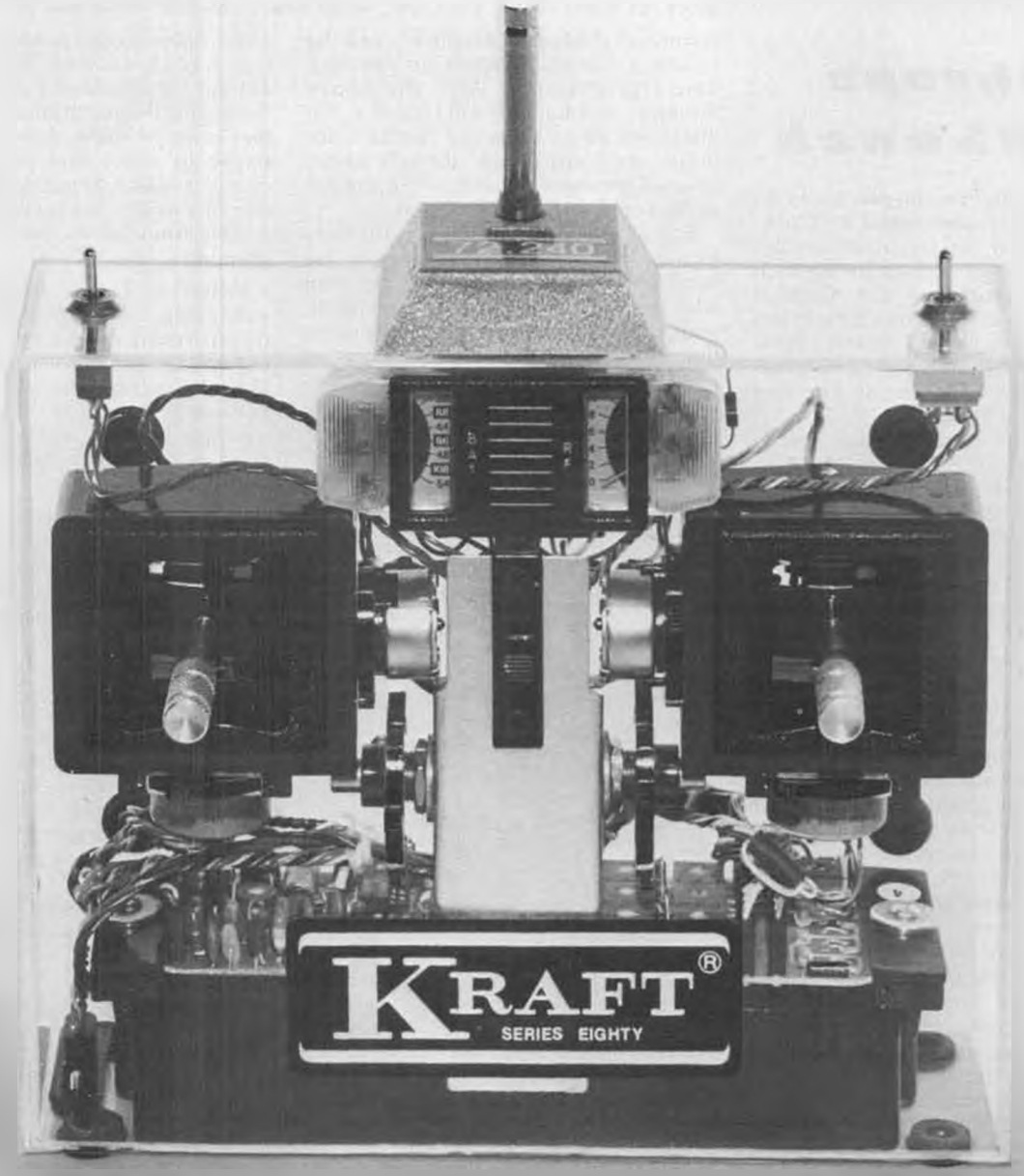

from Bill Northrop's workbench

DOWN MEMORY LANE . . . RCMB's editor at Indiantown Gap Labor Day Weekend R/C Get-ogether, near Harrisburg, Pa., probably 1958. The Great Lakes was McCoy .09 powered (?), with Kraft single, Bonner Vari-Comp, rudder only. Stable flier. RCMB plan 9781.

• It's strange how fate can play tricks on you. We had just completed a "Workbench" editorial for this issue on demonstration flying, inspired by the Rich "von" Lopez article on C/L Combat demonstrations at Candlestick Park, San Francisco, during a pro football halftime (page 48), when word came in on the unfortunate accident at Shea Stadium in New York.

Although our editorial dealt strictly with the choice of R/C aircraft used in demos, it came out strongly against flying non-aircraft objects, and this turned out to be a factor in the accident. Then, a few days later, when news came that the person most injured had died, our immediate reaction was to deep-six the whole story, as one of our strongest dislikes is an I-told-you-so.

A telephone conversation with John Worth at AMA Headquarters confirmed our conclusion . . . make all possible effort to avoid further publicity through the news media; such publicity is usually twisted and exaggerated purposely or through ignorance and could only further damage our relations with the unknowing public. As an example, one of the early news releases stated as follows: "Witnesses say the mostly metal apparatus which weighed between 30 and 40 pounds was being flown . . . etc., etc." Obviously some copy writer assumed that a regular, grass cutting, lawnmower was being flown, and we don't need to dwell on that person's knowledge of aerodynamics!

John Worth also agreed that as model magazines are read almost exclusively by modelers, there is no need for us (the model mags) to restrain from making comment. "Model Aviation" will be issuing a complete report on the accident, for example. With the above thoughts in mind, we will return to our discussion about choice of "aircraft" for public demonstrations, though somewhat abbreviated . . . the safety angle is really I-told-you-so at this point.

Incidentally, we wish to publicly express our heartfelt sympathy to the family and friends of the young man who died of injuries from this accident, and particularly also to Phil Cushman, a fine modeler, and an expert R/C'er of many years experience, who happened to be at the controls when the fateful and unpredictable event took place. It *could* have happened to any one of us on many occasions, and anyone who denies it is not being truthful to themselves or to others.

Our concern regarding public demonstrations has certainly always been with the matter of safety, but also, for a number of years, it has been with a much more deep-rooted problem. This problem has to do with the philosophy behind the desire of those who put on the public demonstrations. Our belief is that most of these demonstrations are staged by those who wish to promote model aviation along with the promotion of a worthy cause, such as incurable disease foundations, handicapped children, etc.

Trophy to be awarded at the Torrey Pines Gulls/RCMB Slope R/C Sailplane Pylon Champs, March 1 and 2, 1980. See text.

When it comes to promotion of modeling, we hope to educate the uninformed public on the skills involved, on the educational aspects for kids, the recreational value for all ages, and on the need for flying fields and meeting facilities that usually bring us head-to-head with local and national governing officials.

With this in mind, it is our opinion that we should avoid the use of non-aircraft-like flying objects when demonstrating before the unknowing public. Imitation wheelbarrows, lawnmowers, and doghouses that may be flown by radio control can only be truly appreciated by modelers who understand the aerodynamic problems that must be overcome to make such objects flyable. These gimmicks may entertain the public, but at the cost of ridiculing our hobby. We need to give it all the dignity we can muster, but a flying doghouse has about as much dignity as a pie-throwing routine.

Every attempt should be made to use aircraft that are as scale-like as possible, and in the interest of safety, as lightly loaded as possible.

Representatives of syndicated cartoonist Charles Schultz have already indicated that they want no further association with R/C flying doghouses and Charlie Brown's Snoopy. Perhaps they're not as "sticky" as we thought . . . just smart!

Continued on page 109

"...THREE if by AIR"

(Letters to the Editor)

Dear RCMB,

I've always made allowances for you American blokes bein' a funny lot what with the way you talk an' spell, drivin' on the wrong side of the road an' all that. But I didn't believe you treated your womenfolk bad until I saw the November cover of RCMB.

Of course a model flyer has to be bloomin' crazy to fly where the landin' area is a 45-degree rock face, but that isn't exclusively an American trait. What bothers me is that he should get his girl to do the rough work. Not only that, but he has gotten her out of bed so early in the mornin' that she hasn't time to fix her Bamet (1) or put shoes on, or even change out of her nightgown.

In retrievin' the model she has ripped her nightgown, but does he care? Does he offer to take it off and mend it with 105-minute epoxy? Does he heck! Instead, he has her balanced agonizingly on the jagged rocks, carefully concealing her torn and bleedin' plates (2). An' she has to hold the model so that damage from landing on those rocks doesn't show.

What beats me is that after all this, she has a smile on her boat-race (3). I sincerely hope that this is because she will get full recompense later.

Seasons greetings to all

Yours, Vic Dubery
Walton-on-Thames

P.S. 1. (Bamet) Fair = Hair
2. (Plates) of meat = Feet
3. Guess what?

Now we know what they mean by "mad dogs and Englishmen." Vic is definitely fog-bound (hazy = crazy)!

Dear Bill,

I have an idea that I hope you can use. I think that many modelers would love to see a listing of the many aeronautical museums. Possibly you could sell updated listings as you do plans.

I doubt that many people would enjoy the burden of compiling a list including location of the many museums, but if you asked readers to write in the name, location, admission fee, and hours of operation, the list would not be difficult to compile. It would be helpful to know the name of a large city near the museum, or airport, also.

Most of us have opportunities to travel now and then, and I always hate to come home and find that I was within a few miles of some interesting spot.

On another subject: the pretty girl standing barefoot on a lava hill at Malibu Beach on the cover of your November issue ought to make a first class wife for some modeler. Women have to learn to deny themselves certain privileges (such as shoes) in order to live with modelers.

Sincerely, Dan W. Lakenmacher
Houston, Texas

You're right, Dan, but she's already a first class wife for "some" modeler. Bob's and Pam's last name is not Smith by coincidence, it's by matrimony!

A list of aeronautical museums or other gatherings of aeronautica is a good idea. If our readers are willing to send in the information, we'll compile a list and make it available for a self-addressed stamped envelope (SASE). When we have at least a half-dozen listing, we'll announce the availability in "Workbench."

Gentlemen:

I would like to identify the "Mystery Model of the Month" in Tom Hutchinson's free flight column for December '79.

The model is a "TRI-F.A.I." designed by Bob Hunter. It was featured on the cover of Flying Models for June-July 1960.

In 1960 I was a high school student, building stunt control line and 1/2A free flight models in every spare minute. Having been mostly inactive in model building since 1964, I am currently rediscovering our hobby. So many changes have occurred; both in technology and prices!

Enjoy your magazine very much. I particularly like to read biographical sketches of prominent people in the hobby; both model builders and people who make my hobby their business.

Whatever happened to: Francisco fuel, OK Cub engines, Berkeley kits?

Thanks for an informative and entertaining magazine.

Sincerely, Bud Eanes
Melbourne, Florida

Your Mystery Model identification is correct, but a little too late to win the free subscription.

What memories your last question brings up . . . that unmistakable odor of Francisco "Power Mist" glow fuel exhaust fumes. Remember the green can? Francisco Laboratories is still at the same address on Glendale Blvd. in Los Angeles, and though it no longer markets fuel for model engines, the company still supplies racing fuels for full-scale cars and boats. Wonder if the exotic fumes are still recognizable?

OK Cub engines, at least in the smaller sizes, were famous for their weak fuel draw. A hard hand launch of a Cub .09 or .14 powered model usually pulled the fuel right out of the venturi and back into the tank! Herkimer Tool Company still exists, but no longer manufactures model engines.

Berkeley kits, famous for their "die-crunched" parts, after the company first closed, were taken over by Duke Fox, and then finally went on to Sig Mfg. Co. As far as we know, all that remains now are a few of the designs, undoubtedly re-engineered to Sig's higher standards. The new Sig catalog still includes a kit for Henry Struck's Nats Flying Scale Winner, a rubber powered, 34-inch span Stinson L-5 Sentinel, a kit that we remember building around 1947.

" 'Climb Mount Fuji' .....what did he mean by that?"

OVER THE COUNTER

• What's this, only one page for "Over the Counter" this month? Normally we need two or three, but this month (December) was pretty lean as far as notices of new products are concerned. I'm told that this is normal for this time of year, as most manufacturers tend to keep their new stuff under wraps until the early-year trade shows come along. (The first, the Pasadena IMS Show, will be history by the time this appears in print.) Hopefully things will be back to normal next month, and we'll also try to present some new items that will be shown for the first time at the IMS Show.

In the meantime, we've received word from MRC that Enya .29's and .35's are being improved to make them even more rugged and dependable than they are at present. The changes include: 1) A heftier crankcase to withstand rough landings and crashes caused by radio problems (pilot error? Not *me!*); 2) Deeper cylinder head fins for better cooling, especially in tightly cowled installations; 3) A crankshaft redesigned for better balance and greater strength; and 4) A steel thrust washer has been added between the prop drive washer and the front of the case. The washer helps reduce wear between these two parts and is especially valuable when the engine is being started with an electric "persuader." Also, the head on the R/C version has been changed to boost the compression somewhat, which permits the use of lower nitro fuels without sacrificing power.

Best part of all is that the price will remain the same on both of these engines: the .29 still goes for $59.98, the .35 for $62.98 (these prices are for the plain bearing versions). From MRC, 2500 Woodbridge Ave., Edison, NJ 08817.

* * *

Repla-Tech's Bob Morrison is starting a new service that sounds like an exciting supplement to his line of beautiful 3-view drawings. Bob, as it turns out, is quite a photographer, and over the years has managed to amass an impressive collection of aircraft photos. Private, commercial, and military aircraft are included, but Bob's main emphasis is on racing and aerobatic airplanes.

The point of all this is that Repla-Tech is making copies of these photos available to the modeling public by offering a service called "Repla-Foto." The prints are arranged in packets according to the aircraft type, and unless otherwise noted on the list, all of the prints in one packet are of one specific airplane . . . just the thing for proof-of-scale documentation. The packets contain from one to eighteen photos, depending on the airplane selected. These photographs are not cheap; black-and-whites are 25¢ each, and color prints are 75¢ each. That may sound steep, but the quality (at least on our sample) is excellent, and you would probably have a mighty hard time locating anything better.

The Super Pumper Mk. IV (top) and Auto Mix, both from Robart.

The Enya .29 and .35 have been slightly redesigned. More dependable than ever.

Best bet would be to send in 25¢ for the Repla-Foto price list, which describes all the photo packets available and also gives full ordering information. Write to Repla-Tech International, 48500 McKenzie Hwy., Vida, OR 97488.

* * *

That semi-scale "Cobra" in one of the photos (is it a P-39 or a P-63? I never have been able to tell 'em apart) is a new offering from Jemco. The airplane is claimed to be an advanced trainer in spite of its high-performance appearance, and from the way the press release talks it up, you'd swear it was really a Piper Cub in a Cobra costume!

The model is designed for .19 to .40 size engines, spans 51 inches, has 490 sq. in., and weighs 3-1/2 to 4 lbs. It is

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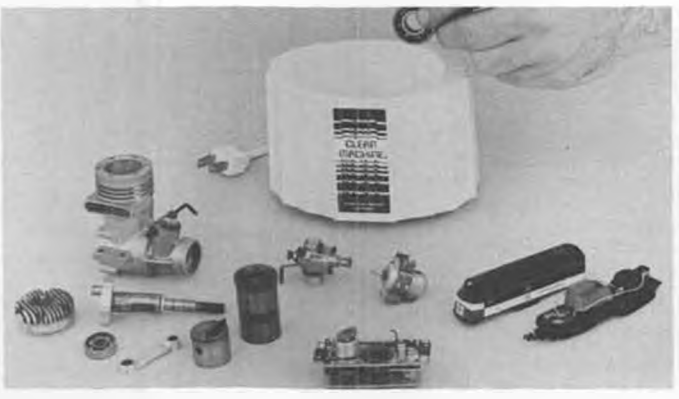


New "Clean Machine" ultrasonic cleaner by American Marketing Inc.

Jemco's latest is this "Cobra," designed as an advanced trainer.

We published plans (91074-O.T., $4.50) for this great semi-scale, 8-foot span Buhl Pup old timer from a 1936 M.A.N., and surprisingly, sold only a few copies. This one built by Capt. Charles Strange, USMC, Camp Pendleton, Calif. Webra Speed 40 power, 6-1/2 lbs., Super Coverite.

R/C WORLD

By BILL NORTHROP

SYNCHROGYRO GEARS

Since publishing Georges Chaulet's twin-rotor R/C autogyro in the September '79 issue, we've had numerous inquiries about sources of beveled gears for synchronizing the overlapping rotor blades. Georges used Meccano gears, which are apparently readily available in Europe, but not so in the U.S.

John Bell, of Port Charlotte, Florida, found a U.S. source, and we're ashamed to admit, we had looked in the same catalog and missed them. Stock Drive Products, 55 S. Denton Ave., New Hyde Park, NY 11040 is the source, and their 745 page catalog is a mind boggler.

The bevel gears are catalog number 1B3-Y32016 B, are bored 3/16, and give an angle of 37°, even better than the 45° Meccanos. Shaft bearings can be ball-bearing (No. 7Y55-F3718) or sintered bronze (7B4-F043). Stainless 3/16 shafting is also available, but a length of 3/16 music wire from your well-equipped hobby shop will do the job.

For a mounting block, John drilled two maple blocks to fit the shaft bearings, cut and trim-sanded them to provide the 37° angle, and joined them with Hot Stuff. He says it works perfectly.

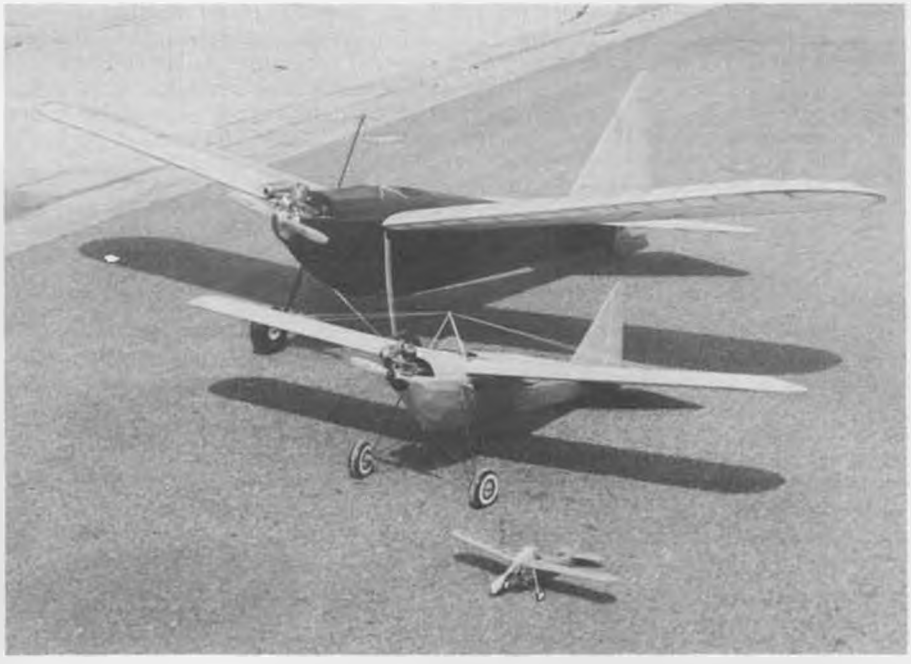
Write to Stock Drive for its latest catalog and price listing. John spent just over $20, but that included stainless shafting and ball-bearings, neither of which is really necessary. The gears were the most expensive items, at $5.76 each.

THAT ELUSIVE C.G.

Again, we're not referring to Carl Goldberg. He isn't that hard to find. But after more than two years since publication, and Lord knows how many plans sold and how many models built, someone just recently wrote in to ask about the C.G. location on our 3-inch scale Gipsy Moth (Plan 6771).

We must admit that after all these years, we're not really sure where the Gipsy balanced, but it never hurts to start out with a tried and true rule of thumb that works most of the time for that type of aircraft . . . one-third of the chord back from the leading edge.

On a biplane, there's one other step. Locate the one-third point for both the top and bottom wing. Draw a line connecting the two, and determine the point halfway between. Now run a perpendicular line from that point to the



Capt. Strange went ape on the Buhl Pup! Half-size of original O.T. is .15 powered, and the Peanut Scale model is one-loop-of-1/8-rubber-powered. Where will he go from here, up or down?

Woody Woodward's 1-1/2-inch scale Aeronca O-58 "Defender", in civvies, is a perfect match for Bill Cannon's new, tiny "Super-Micro" radio. Max .10 is just right power at cruise setting.

Scratch-built 'Pete' (and Paul) by Ken Cashion, Picayune, Ms. Engine identical to full scale Pete flown in Lafayette, Louisiana.

Ron Ewing, at Hillman Field, Pittsburgh, Pa., with his Super Telemaster. It's covered with Silkspun Coverite and dope/urethane finish, K&B .61. Photo by Duie Matenkosky.

bottom surface of the top wing and mark its location on the model as your assumed balance point. It's a safe trim to use for your first test flights. After that, you experiment for the optimum balance point relative to what you're going to do with the plane. Further forward will provide smooth flight with less control response. Further back will allow quicker or aerobatic maneuvers, but control response will be more touchy . . . OK if you can handle it.

On the Gipsy, 4-1/2 inches back from the leading edge of the top wing is about right for smooth, effortless, scale-like flight.

1980 T. OF C.

Although the 20 contestants for the 1980 Las Vegas Tournament of Champions have already been chosen, the aircraft specs should be of interest to those who might like to put on a similar contest. The specs are as follows

A. Model aircraft shall be a replica of an actual full size aircraft designed for aerobatic maneuvers. Military primary trainers will also be acceptable. It is responsibility of the contestant to document the aerobatic capability of full size aircraft chosen.

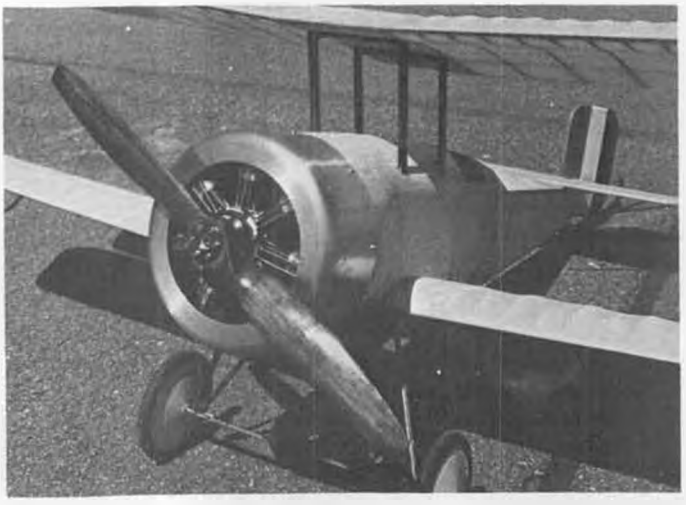
B. Maximum deviation from scale will be 20% except as noted.

a. The following dimensions shall be within a 10% deviation from scale.

1. Wingspan
2. Wing chord at root
3. Fuselage length
4. Fuselage width
5. Fuselage height

b. The scale of the model will be determined by the model's wingspan as

Duie Matenkosky with his 4K's kit version of the Buzzard Bombshell. Solarfilm, Enya .35, Kraft/Ace radio combined for 3 channels.



A 7-cylinder Damo! On a Bristol Pup by Greger Matensson, Stockholm Flygklobb. Can you get it? Ask Jerry Nelson, not us . . please!

Irwin Ohlsson's Grumman Widgeon, piloted by Joe Bridi, roars past spectators at Lake Elsinore, California. Pulled by two Kraft .60's.

The editor's Powerhouse, K & B .40, on old style Gee Bee Line floats. A fun combination for water flying at Lake Elsinore.

compared to the full-size aircraft wingspan.

c. The general contours and shapes of the model shall be similar to the full size aircraft.

d. The model's airfoils need not be similar to the full size aircraft.

e. The control surface hinge locations and type can be different on the model as compared to the full size aircraft.

f. The fuselage shape cross section (not width and height) can be altered on the model as compared to the full size aircraft.

g. Additional controls and flight control surfaces cannot be used on the model unless the full size aircraft had such control or control surfaces.

h. Any type of radio control equipment and control levers or switches can be used (except as noted in Section B.g.).

i. Color scheme and colors need not be the same as the full size aircraft, however, the scheme used on the model shall be similar to what is used on full size aircraft.

C. Maximum size engine(s) shall be 35 cubic centimeters — total displacement 2.1 cubic inch. Effective silencer to be used.

D. Maximum weight ready to fly less fuel shall be 7.5 kilos (16.5 lbs.). Biplanes (18.5 lbs.).

Irwin Ohlsson, the famous engine man, his son Gus (in the straw), and lo and behold, Dick Branstner, of Bramco radio fame, between flights of Irwin's Widgeon, at Lake Elsinore.

Mel Santmyers, Stanton, California, with his 1/4-scale Piper Tomahawk, seen during the most recent scale "un-contest" at Mile Square Park, Fountain Valley, California.

E. Minimum wing area will be 1100 square inches on monoplanes and 1400 square inches on biplanes.

F. Model shall contain a realistic pilot and instrument panel of the appropriate scale.

Hmmm. Item B.b. could be a little confusing. If the model's wingspan can vary 10% according to B.a.1., but the scale of the model is determined by the model's wingspan, then the wing will always be to scale, no matter what span it is!

This year's tournament will take place on November 13 through 16, and total prize money will be $75,000. First prize is $20,000, second is $10,000, and the last 6 places are worth $1,500 each. Whatta contest. You can't even lose if you come in last! •

An even-numbered year has popped into view, the Christmas bills have swamped the hobby budget, the office party headache is gone, and the scale project that you were going to have ready for 1979 now shows every evidence of never making it for 1980.

New ideas abound around us and new rules will be appearing in black and white to govern our competition flying for the next two years. Some models get bigger, engines more powerful and the whole mess makes a shambles of my checkbook.

Fast glues get slower, kits get fancier, and still no one will make a spinner that will fit a Widget 10 at two inches to the foot. The guy in your club who has been trying to get a ducted fan to fly for the last three years maintains it will happen this year or he will blow up the whole darn thing.

As we head into this year perhaps we can garner some of your ideas, frustrations, thoughts, whatever, on the shape of things. I would like to pose the following items for your consideration in the hope that you will send a communication to me that might be incorporated into this column during this wonderful Olympic year.

Choose any one of the items that mosey in down the column a ways. They are beginnings, and all you'll need to do is take pen in hand, (or crayon, if they won't let you have sharp objects) and dash off an answer to one or all of these that will astound your fellow modelers. We could perhaps suggest some stupid rule like 100 words or less, but forget that since I'm not about to sit around and count words.

In addition to seeing your ideas and name in print in such an august publication as this one, I will purchase and send to you one of the attractive patches being sold by NASA to support the 1980 Scale Internats for each item used.

"A technique I developed that helped me with a frustrating building problem is . . . "

"As a scale builder I'd like to see . . . "

"A problem I can't seem to lick as a scale modeler is . . . "

"I'm a scale modeler because . . . "

Hang them on me, scalers! I can't promise to use everything, but I'll make a sincere effort to use as much as I can. Let's make this "1980, A Full Scale Year." Mail to Bob Underwood, 4109 Concord Oaks Dr., St. Louis, MO 63128.

THE IMPORTANT CONNECTION

The idea for your project was born years ago. It held a special place in your mind for a long time as you patiently collected material and dreamed of the day when you'd be able to fulfill your commitment to building it.

Now it's taking shape. The outlines have filled out and you can anticipate that time when you'll see it fly. But before that occurs you have to make provisions for the mechanics that make it go. So very often the thrill of creating a new scale project does not adequately include the installation of a workable system for the radio and the engine.

Excellent action shot by Monty Groves, Sunnyvale, Calif., caught landing approach of Fw 190 (Pica kit) built by Dave Vincze, Sacramento, during War Birds West meet at Morgan Hill.

1 TO 1 SCALE

By BOB UNDERWOOD

Many times we fail to consider the ramifications of this factor because the kits we have built had this problem at least generally engineered into them.

At times what occurred was that engines, tanks, radio, etc. are laid out on the initial drawings and structure designed around them. While this can be a most satisfactory technique, it does not always work. In the actual construction, little things creep in such as thicknesses of needed extra doublers, braces, and the like. It becomes wise to not only attempt to anticipate these items but literally have them available and fit them as you are building.

While many sport scale models do not have a great problem in this respect due to the lack of concern needed for full cockpits and the like, precision scale models often are compromised. Areas that require special consideration include engine cooling and accessibility, tank location, radio accessibility, pushrod locations, switch location, and related wiring problems.

Types of aircraft that pose special problems include those with very short nose moments, extra large cockpits, thin pointed noses, twin booms, biplanes with ailerons in both wings, and a host of others.

Treating these problems cannot be a cut and dried situation, but I will offer some thoughts which have served me in good stead over the years.

ENGINE LOCATION: In most cases you would like to get that heavy mass of metal as far forward as possible to help compensate for all that stuff behind the CG. In a sport scale model the fact that the head hangs out is not of any great consequence unless it appears to the judges that you could easily have stuffed it away. Granted, the rules specifically state that the engine is not to be considered if it is highly visible, but it also states that this is true for models where nothing else can be done. Each of us, I'm certain, has seen pictures of beautifully executed models that could very easily have accepted a cowled inverted engine, but which have the thing sticking out the top like a chrome thumb. In this day of onboard batteries, starters, and reliable engines, there often is little reason to do this.

If the engine is fully cowled, do not place the engine head slam bang against the firewall. To dead-end cooling air with little or no room to circulate is bad news. In like manner, to assume that a big open space around the engine will serve to cool it is a fallacy. The circulation of air over and around the cylinder head is of prime concern. Ducting this air with pieces of aluminum or fiberglass is wise. Bear in mind also that you need twice as much exit area for the air as entrance. This is due to the expansion of the air in the cowl due to heat.

Remove the heated engine exhaust as quickly as possible. While a number of the manifolds or mufflers tend to act as a heat sink, they certainly will not completely handle the amount generated. Along that line you may want to consider a large, finned sink for the head of your engine. At last year's Nats, Earl Thompson utilized a shaft extension to move the operating engine behind the dummy, and then incorporated a large metal heat sink. In spite of a rather restricted flow over the head due to the dummy cylinders in front of it, he generally encountered no serious problems in the very hot Nebraska weather.

Check to see that all parts are accessible in the engine compartment. Openings for fuel lines, methods for fueling the model, plug attachments, and throttle arm movement are a few of the necessary concerns. I recall one model I built that required removing the engine to change a glow plug. That is something less than intelligent. Another problem developed years ago when I discovered that the cowling could not be installed on my old Stormavick when the muffler was in place. However, if the cowling was fastened you could not attach the muffler. Needless to say, a little redesigning occurred to solve that little problem.

Some consideration needs to be given to the needle valve also. Again, in sport scale, that little knob isn't really a problem hanging out. To hide it and still make it adjustable can be a challenge. Several solutions can be used. You might attach an extension by silver soldering, if necessary. In some cases, a small slot cut in the end will provide a way of using a screwdriver, although this is sometimes difficult to locate and hold while the engine is running. A tubing guide glued into the cowling will help here. A second detachable arm I have used is a small piece of *square* brass tubing with an "L" bend in the end. By grinding flat areas on the small tip or projection found on some needle valves, you can have a positive means of turning it even while the engine is running. Be certain, however, to make a couple extra for your toolbox so that when you drop one into the grass alongside the runway, you can come up with another one quickly.

TANK LOCATION: Most everyone is aware of the need to locate tanks so that the tank center is not too far above or below the needle valve assembly. Of course, with a few kinds of pumps available we have some degree of freedom in this matter. It still behooves you to keep fuel lines short and tanks located so that any tendency to lean out is at a minimum.

Take care that fuel line bends are not sharp or likely to be pinched off if the tank shifts forward in a hard landing. Some tanks are designed in such a way to make this less of a problem and position themselves quite well when placed on the hardwood motor mounts. Of course, much more care needs to be given for a radial mounted situation.

Consider the vents involved in your application. With an increasing use of either crankcase or muffler pressure, a decision must be made as to how easy it will be to get to a fill line. Again, this is not always an easy matter, especially in a full cowl situation. To fill through the carburetor line may be next to impossible, and if you have a filter in the line, not advisable. On the other hand, to fill through one of the vent lines will result in filling the engine as well. One solution may be one of the commercial filling gadgets *if* you can figure out where to put it so it doesn't detract from your airplane's scale appearance.

RADIO INSTALLATION: Most radio systems, in addition to being a reliable piece of equipment, very often have various types of mounting trays to accommodate servos, switches, etc. Somehow or other, those of us involved in scale often wind up with installations which cannot use the combinations available, due to such things as space or location requirements. The various side mounts often prove quite helpful, but a word of caution. The useful length of the arm is often reduced, making it necessary to raise the mount somewhat.

In cases where commercial mounts are not usable, we must resort to the good old rail mounts. I have found 1/4-inch plywood cut into 3/8 to 1/2-inch widths quite adequate for mounting. In the case of attachment to fiberglass fuselages, be certain you carefully clean off the waxy residue and attach the rails with cloth and resin or silicone rather than epoxy or other incompatible materials.

All too often, modelers seem unwilling to mix servo types to solve space requirements. In certain applications such as high load surfaces (ailerons, elevator, flaps, etc.), a heavier duty servo may be required. However, such things as the throttle generally can use a servo with much less thrust. This can lead us to the possibility of smaller, more compact equipment which can be tucked into nicks and crannies. There is also a saving in weight which can come from this.

Scale models often require that three or more servos be located in the wing. If this is true in a foam wing, be very careful that you do not destroy too much of the structural integrity of the skin. After all, that's where the strength is. This can be overcome, however, by the use of braces. Working around dihedral braces, pegs used for fuselage attachment, nylon screws, etc. can become a real challenge. A last thought here is to make absolutely certain that the fuselage mounted and wing mounted servos don't interfere with one another. That's another clever trick that I've managed to pull.

One concern that is most important to consider is how far apart all this radio equipment is located. The use of servo lead extensions can solve many of these location problems, but use your radio manufacturer's recommendations to determine the maximum length which can be used before problems develop. In addition, remember that every time an extension is used, you add another plug connection. Make certain that slack is maintained in the line and that the plugs are secure.

PUSHRODS: Make every effort to use a solid pushrod, if possible. Once again, sport scale models can generally accommodate them, but precision models very often are absolutely unable to do so. If you are going to use the flexible type, bear in mind that there are several varieties, from semi-rigid to very flexible. A little ingenuity (and paint) can allow you to snake it through an open cockpit and keep it unobtrusive. One application I've seen used was to simulate a tubular metal frame member.

Though the newer varieties are less temperature sensitive, you will need to compensate for the expansion and contraction. Very hot days in the sun can produce an appreciable change in trim. Most radio systems will contain enough trim adjustment to cover the change, except where models may suffer due to a critical CG and fuel consumption or where the pushrod is very long. The 46-inch rod in the Bonzo produced quite a dramatic trim change between the 68° basement and a warm, sunny day.

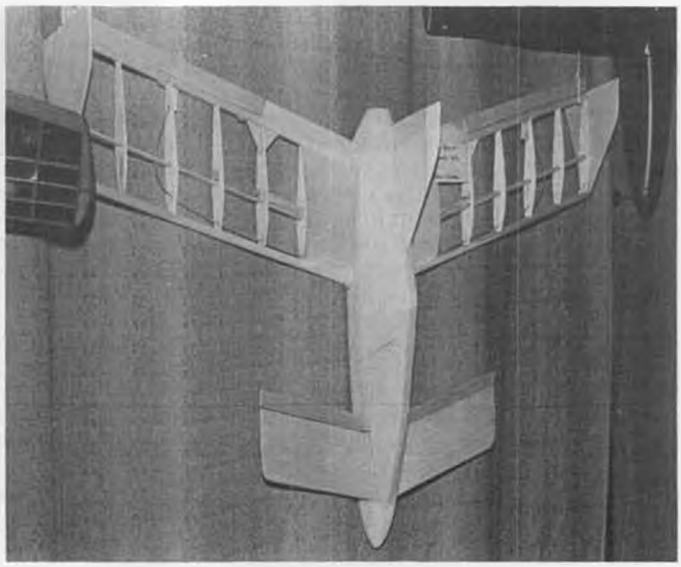
Most of the things I've suggested are ones you may have already encountered to a lesser degree; however, they require careful consideration.

PARTING SHOTS

Are you making plans to attend some of the nifty all-scale events that have developed over the past several years?

How about purchasing a super-looking patch to support the team fund for Scale '80 in Ottawa? The patches sell for $2.00 and all proceeds will help support the U.S. teams in control line and radio control. Contact NASA or your writer. •

A 1-to-1 scale aircraft making 1-point landing! Photo by Monty Groves, of Cessna L-19 paying a visit at Hill Country, Morgan Hill, Calif., during War Birds West Scale Meet last May.



Ron Van Vlear certainly doesn't hold back when dreaming up new designs. The stubby little one on the left (looks like a Ray Stits creation) carries just 180 sq. in., has a very short span and *very* short tail moment. No word on how the pusher flies, but it sure looks wild!

The 1/2-A SCENE

By LARRY RENGER

As promised last month, I'll continue to try to present more of the model photos I have for you to see. Some of these were submitted, and some are ones I shot myself. The first three models are by a very prolific and original designer, Ron Van Vlear. Ron is currently working at California Model Supply, and certainly doesn't bother doing "me too" designs. Each one is interesting almost to the point of being spectacular.

All three models are powered by Tee Dee .051 engines and fly with two-channel controls. Wing areas range from 180 sq. in. for the sporty low aspect ratio model to 216 sq. in. for the canard. Ron tends to like metallic color schemes, generally in blue or green. The models are beautifully built, I looked them over carefully. I think that the twin-boom pusher fits the 1/2A pylon rules, but I'd sure be careful hand launching it!

Next photo is a new ready-to-run from Cox. The Hydro-Blaster is a bead foam molding with injection molded components. The model includes both radio and engine. Looks like a lot of fun with little effort. Power is provided by a pusher air prop configuration, so you needn't be concerned with prop fouling, stuffing box lubrication, flywheel starting, and all those other fun things our boating friends get involved in. I understand that it is not too fast for the beginning or younger modeler to handle.

This beauty is a free flight! Power for Jack Bales' P-61B Black Widow is (wouldn't ya know) two Black Widow .049's.

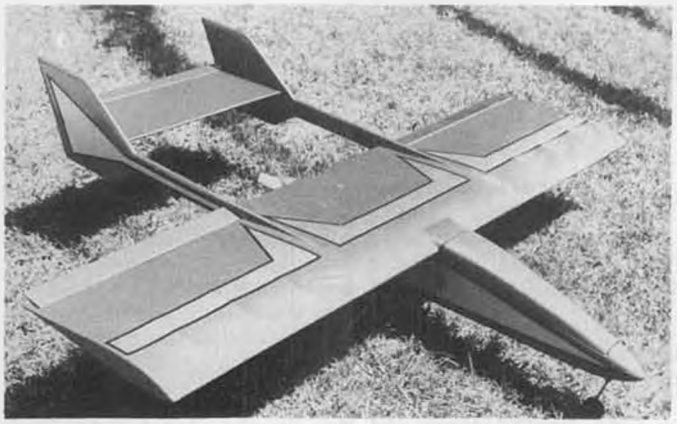
The Douglas SBD-3 was built by Gary Paczkowski. He started with a Guillow kit and added 6 inches of wingspan. Power is a throttled Tee Dee .049, and rudder and elevator use the other two channels. Gary rigged the model to drop a bomb on full up elevator, so he can execute rather realistic dive bombing runs. The model is always hand launched and really looks well built. The fuselage was sheeted with 1/32 balsa. Gary said it took six months to complete.

The final model for this month is a, would you believe, FREE FLIGHT! Jack Lynn Bales built a P61B, otherwise known as a Black Widow. Happily, Jack chose the most appropriate power source, a pair of Cox Black Widow .049's. In order to avoid problems in engine run and single-engine stability, Jack provides the fuel pressurized from a single central fuel tank. No details available on how he starts them, but I guess you could use an electric starter while opening the needle valve to avoid pre-start flooding. All up weight is 24 ounces. Finish is a weathered black.

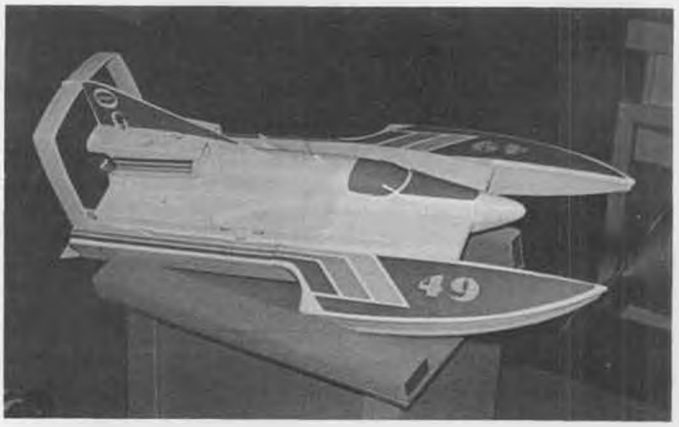
BEGINNER'S WORKBENCH

Since there are more and more of the larger engines in use by us half-A good-guys, I thought it might be a good idea to discuss break-in of engines larger than .049 size. As a long-time user of exclusively Cox engines, I had to revise my thinking when I started using the larger .10 size engines from a variety of other manufacturers.

I would like to state that a need for long break-in is not the sign of a poorly designed or built engine. Some of the finest engines made require extensive running-in to achieve peak power. One of the main things achieved by long and correctly done run-in is to thermally cycle the engine parts and then allow wear patterns to be established on parts



Yet another Ron Van Vlear eyecatcher is this unique pusher, powered by a Cox .051. Must be kinda tricky to hand launch.



Latest from Cox is the "Hydro-Blaster" ready-to-run R/C boat. Faintly reminiscent of the old Cox "Water Wizard" hydro.

which have reached their final dimensions. Once done, you have an engine which will not wear out in any practical length of time in a clean environment. Both Duke Fox and Cox Hobbies have run engine life tests to my knowledge. In a clean test room your average model engine is good for something like 300 hours of steady running before the piston and cylinder fit will show significant wear. The lesson to be learned here is that you must exercise extreme care in how and where you run your engines. You can do an instant wear-out by breaking-in your engine close to the ground where it can kick up dust and suck it in. If you find the outside of your engine feels gritty, guess how the inside must be!

So, the first thing you need is a good, solid, elevated, and clean test stand. You can buy hardware to assembled a sawhorse and add mounts for engine and fuel tank a lot more cheaply than purchasing even one new engine! The sawhorse can be collapsible for easy storage, too. Second, consider getting a scrap of linoleum to take to your flying field for a place to start your model and do running tests. You will be able to keep it really clean, and find dropped screws and stuff, too. Two other benefits are that it is easier on your knees, and spilled fuel won't eat the asphalt or kill the grass.

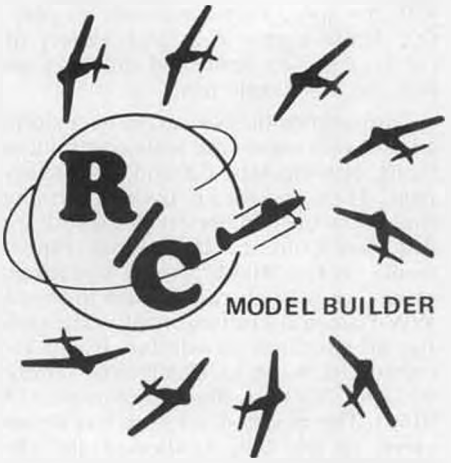
Next, select the correct fuel and prop for break-in. I prefer my prop to be slightly undersized, and I balance it with extreme care, since the surface friction in the engine is greatest at first and wear due to unbalance would be aggravated. Fuel should be slightly lower in nitromethane content than you will ultimately use. I suspect that 5% to 15% nitro fuels will do nicely, depending on the sportiness of the engine. Highly tuned engines might be difficult to start with the nitro content too low.

The trick in good break-in is first to run the engine slowly but smoothly, and then increase the speed in short bursts, always returning to the low speed. Eventually you can let the engine run at its full rpm on the small prop for extended periods. At that point you can begin to move up in the prop size and nitro content until the engine will comfortably hold full rpm on its correct size prop with the highest nitro fuel you intend to use (probably 30% for the newer Schnuerle ported engines).

When revving the engine up, you have to listen carefully as you lean it out. Do not let the engine overheat or go over lean; be ready to quickly richen the mixture again. If you are leaning the needle out and the engine sound seems to drop in rpm or (very hard to describe in words) the sound gets like the engine is straining, you have gone too far. Running over lean will destroy even the best broken-in engine quickly, and even more so a new one which is still tight. What is happening is that the piston is expanding more than the cylinder due to the heat, and the parts are binding.

When in doubt, follow the manufacturer's instructions. There is not an engine made by anyone (Cox included) that should be flown right out of the box.

Well, that is it until next month. I still have lots of photos, so I'll keep pouring them on until I run out, or someone tells me they want something else. I appreciate the kind comments in your letters, and would welcome any requests for information or topics you would like discussed. •



Absolutely gorgeous SBD-3 by Gary Paczkowski is based on a Guillow kit. Has rudder/elevator/throttle controls, flies with a Tee Dee .049. Gary added six inches to the span to get a little more wing area to better carry the weight. Full up elevator releases bomb.

ELECTRIC POWER

By MITCH POLING

PHOTOS BY AUTHOR

• Electric power is ideally suited to scale planes for many reasons, and it is almost inevitable that anyone flying electrics will eventually try their hand at scale. My own list of electric scale planes includes the Sopwith Tabloid, the Sopwith Triplane, the ME-109, the Piper Cub, the Cardinal, and the Fike. The Fike and the Triplane need more work to get them to fly right; the rest are good fliers and a lot of fun. I have found that it isn't so much the plane you choose that gives you success as it is your own knowledge of set-up and design. The ME-109 is the best flying one of my scale planes, yet I would have thought it would have been the least likely to fly well, especially since I fly it with only 130 square inches, with an Astro 020, and rudder only! I think that any airplane that successfully flew in full scale can be dupicated and flown well as an electric scale model. The advantages I mentioned earlier? Instant starting, easily cowled motors, multi engines are easy, no oil or fuel or vibration to destroy detailing. There is also no point in putting a heavy finish on an electric, as it doesn't need it. I use clear Monokote or Solarfilm and paint it with the spray Pactra enamels for plastics. These come in a large variety of colors, they are light, and they stay on well. So, it's simple too!

Tony and Addie Naccarato have done a lot of very successful scale control line flying with the Astro 020 and R/C battery pack. Tony and Addie, besides running one of the best hobby stores around, are Brigadier Gold and Lt. Colonel respectively in the Black Sheep Squadron model club (such rank!), and promote WW-II scale aircraft vigorously. The club has an excellent newsletter; if you are interested, write to T&A Hobby Lobby, 3512 W. Victory Blvd., Burbank, CA 91503. The newsletter I have has three-views of the Bell Airabonita and the Navy "bomber" version of the Lockheed Vega (I didn't know it existed!), news of activities such as halftime flying exhibitions, and photos. But, back to the control line electrics. These are built from Guillow kits, 3/4-inch to the foot, and they really look good. The covering is painted Solarfilm, the batteries are inside the plane (no "through the lines" power), and the flight performance is very good. The flight lines are .008 by 20 feet steel for indoor flying, and .008 by 25 feet steel for outdoor flying. Addie is holding her P-47 Thunderbolt in the photo. Its flying weight is 12.5 ounces.

This is a good flying weight; my rudder-only ME-109 weighs 14 ounces and flies very well as a comparison. The other photos show Tony's F4U Corsair (12 oz.), Dick Burkhalter's Stuka (12.5 oz), and Bob Trace's P-40 Warhawk (10 oz.). These planes may put on an exhibition flight show at the IMS Show at Pasadena in January, it should be fun to see. Last year Tony put on a show with his electric Baby Flight Streak with an Astro 020, and it was a big hit.

A ready-to-fly scale electric is now on the market: the Cessna Cardinal by Kraft. It is very good looking, and two of them that were entered in a local 1/2A scale contest won second and third place. That's pretty good for an airplane that comes completely assembled! The only work required is to put on the decals and install the radio . . . no more than an hour's time. The flying weight with the Kraft Sport radio is 34 ounces, and with the Cannon radio it is 32 ounces. The span is 44 inches, the area is 290 square inches. The motor is identical in size with the Astro 075; that is, a little longer than the Astro 05, and the same diameter. The motor turns the 8x4 Top Flite prop at 8500 rpm, the same as an Astro 075 on eight cells. However, the Kraft motor does this rpm on six cells . . . a remarkable accomplishment. It does it at the expense of a heavy current draw, around 13 amperes (as compared to 9.5 amperes for the Astro 075), so the run time is shorter than for the Astro 075. The flight time is about four minutes, which is plenty for the beginner, so this is not a major problem. The high current draw also means that the battery does get hot, which is a problem on warm days. I recommend that the plastic wrapping around the battery be removed for warm weather flying; this will improve air circulation around the cells.

The plane flies very well. I was quite impressed by mine, as it has a fast climb and lots of power, much more than I had expected. It's hard to believe that six cells can deliver the performance this plane gets; it is comparable with eight-cell performance of other planes. Loops are easy with some speed buildup, and so are ROG's from hard ground or pavement. I did find that the minimum throw as recommended in the instructions was really too minimum when the power ran down and it was time to land.

It was all I could do to turn the plane when it was on a slow landing approach, so I went to maximum control throw and found that the plane leaped at every

Tony Naccarato is at it again, this time with an electric control line scale Corsair! Power is an Astro 02 with the R/C battery pack. Weighs 12 oz.

Bob Trace has the lightest of the electric C/L warbirds, comes in at just 10 oz. All of these models are built from Guillow kits, fly on 20 to 25-foot lines, indoor or out.

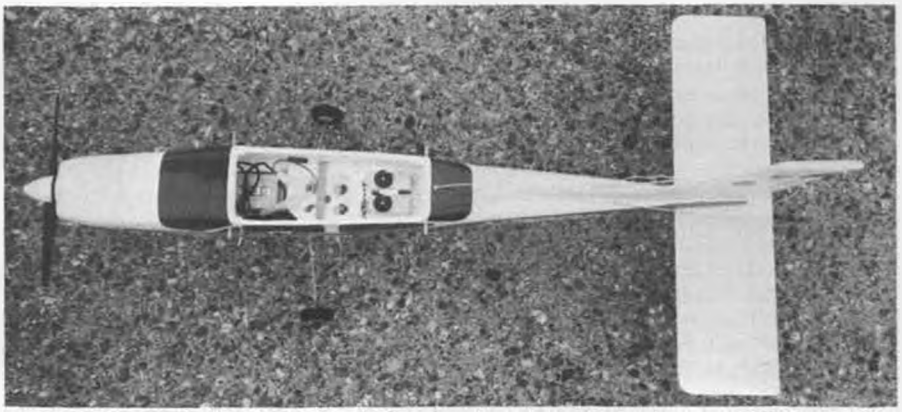
Kraft's new all-foam Cessna Cardinal is great for beginners in electric, or for just . . . regular . . . beginners. . . period!

For field charging, the Kraft charger can be hooked up to a 12-volt battery, in this case two gel-cells in parallel.

touch. Somewhere in the middle is best!

I have gotten in the habit of using a push-on, push-off switch for motor control, so I found the toggle switch provided all too easy to trip accidentally. I changed it to the push-push switch and moved it inside so I could use full down elevator to trip it on and off. This is much safer, and it can be turned on and off in the air.

The wing has to be taken off each time the motor battery is charged, and at first glance this seems to be inconvenient. In fact, I think that this is a good idea, since it allows a check on the battery temperature. Since this is a high current draw system, this check is important. If the pack is warm, it is all right, but if it is hot to the touch it should be taken out and allowed to cool. Two battery packs would be a good idea for continuous flying. The charger supplied by Kraft works off twelve volts and uses a red indicator light to show that charging is going on. This is really not enough. I spent one afternoon wondering what was wrong, with very poor flights, because the batteries were not getting a full charge. I recommend either inserting an ammeter into the line (0 to 6 ampere range is fine), or purchase an Astro Flight Rapid Charger. The four-cell switch on the Astro charger charges the Kraft system at 2 amperes, which is about right for a 15-minute charge from a flat battery (prop barely turns). I have been using a homemade charger with a meter and rheostat, and I charge at three amperes for ten minutes, which gives excellent flights every time.



Component layout in the Cardinal uncluttered and well thought out. Motor battery has to be removed for charging, was out being charged when photo was taken.

The Cardinal looks quite realistic in flight. An extremely easy airplane to fly.

My overall impression of the Kraft Cardinal is that there has been some good design work in it, and that it flies very well indeed. The plane is quite responsive and goes where you tell it to. It requires positive control, unlike Old Timers and gliders which can do their own flying thing whether us pilots are around to bother them or not. For this reason I do recommend that beginners have someone to help on the flying for the first flights, because the plane is responsive and a beginner can get behind what the plane is doing. Kraft has done a good job, and it sure makes getting started in electrics quick and simple. Try it, and fly high! •

Not to be left out on the fun, Addie Naccarato built this P-47 for electric C/L. These are pretty big models for an 02 motor.

Dick Burkhalter's Stuka is a real attention-getter, weighs 12-1/2 oz. Finish on all these models is painted Solarfilm. Flying two or more at once would be really exciting!

FLYAWAY!!

By DAVE THORNBURG . . . Most radio failures end in spectacular crashes, but a flyaway can be even worse than a crash. Here are some common sense rules on what to do if your R/C model becomes a F/F.

• Sooner or later it happens to everyone. You're way off downwind, a speck in the sky, circling blithely in the day's biggest thermal. Look at her climb! Better think about coming home, though . . . she's starting to get hard to see. As she comes around into the wind, you kick in opposite rudder to straighten her out for the long drive back upwind. You kick in opposite rudder and NOTHING HAPPENS . . . she just keeps circling!

The flesh at the back of your neck snaps to attention like somebody had just poured a fresh daiquiri down your collar. You hit the rudder even harder. Still no response.

"I AIN'T GOT IT!" you screech manfully.

"Hold the antenna up," a calm voice suggests. Your flying buddies are invariably calm at this point. It isn't *their* airplane, after all.

You whip the antenna to full vertical, hoist the transmitter arms-length above your head, and pirouette about on tiptoes, wiggling the sticks like you were churning butter. Still no response.

"Looks like we got us a flyaway!" somebody announces, with just a touch of glee in his voice. Up until now, it's been a pretty dull afternoon.

Your plane is disappearing downwind fast. Your next response is likely to be to give chase ("Feet, move!"), waving the antenna over your head like the flag of permanent defeat. Be careful! *The next three minutes can make or break your chances of ever seeing that model again.* This is no time to lose your head; you need to use those three minutes wisely.

Giving chase to the model on foot *may* work. You just might be at the ragged edge of your radio's range, and a quick hundred-yard dash could conceivably get your control back. But the odds aren't good. Here are two of many reasons why:

First, unless the plane is drifting very, very slowly, you don't have a prayer of closing the gap on foot. Top-notch marathon runners can average 10 mph on open pavement. Even a very frightened modeler would have to be darn good to do half that, over rough terrain and waving a bulky transmitter. And how often is the wind aloft under 5 mph? So before you dash off the field on foot, be sure someone is going to be following you in an automobile. What do you think God invented Henry Ford for?

Second, most radio problems are battery problems. And battery problems only get worse over time. If by chance your transmitter pack is at fault, you might conceivably shut it down while you're sprinting, give the batteries a minute or two of rest, and come back with enough power to reach out to your wayward plane and drive it home. But I wouldn't count on it.

There are more profitable ways of squandering your precious three minutes. The following strategy evolved from years of free flight flying, and early single-channel flying, which was just like free flight, only heavier. (Lately I've been chasing a lot of beginners' planes, so the game goes on. It isn't something you outgrow.) Over the years, certain *rules of the chase* have evolved, much the way fox-hunting developed in England, or coon hunting in Arkansas. Behold:

The first rule is, *never take your eye off the airplane, even for a second.* A radio plane, whether sailplane or power, is neither as light nor as stable as a free flight. The chances are very good that it will be upset by a gust, or a stray radio signal, or a dying transmitter, and fall out of the sky like a used satellite. Even though you note a plane's position in the sky carefully, when you look again it may well be gone. So keep your eye on it. If you're pursuing by car, let someone else do the driving. No matter how near the plane appears to be, you must track it *all the way to earth* if you hope to recover it easily.

I once lost a bright red, six-foot-span Zephyr (April '67 *American Modeler*, may she rest in peace) off the top of a tall, ugly slope in central California. It disappeared from sight before it landed in the wheatfield below, but the plane couldn't have been over 100 feet high when I lost sight of it. "No problem," sez I, and spent the rest of the morning flying a second plane before making the long climb down to retrieve the Zephyr. But 100 feet of altitude at a 10:1 glide ratio generates a potential glide circle 2000 feet in diameter . . . that's 22 acres of waist-high winter wheat! That plane was red as a firetruck, and for all I know, it still is. We never found it.

So the importance of keeping your eye on the plane can't be over-emphasized. And neither can the second rule: *get every other available eye on the plane, as well.* Shout loudly about your flyaway, ask everybody on the field to watch where it lands. Don't be shy. You can't have too many sightings, especially if some of the observers are off to either side of the plane's line of flight; by a sort of crude triangulation, you can often get an idea of how far away it landed.

A third rule is no less important: when the model is obviously close to disappearing (dropping behind a treeline, gliding into tall grass, fading permanently into a cloud) STOP THE CHASE. If you're afoot, stop running, catch your breath, and prepare to take an accurate sighting on the plane as it disappears. If you're in a car, stop and get out. The most critical few seconds of the pursuit are those just before the model disappears. You must have both feet on the ground at this point if you ever hope to see your model again.

The fourth rule is obvious: *mark carefully the point where the model lands or disappears.* Many fliers treat this rule too casually, either from overconfidence ("We got it made!") or underconfidence ("Well, that mutha is gone

Continued on page 95

PHOTOS BY AUTHOR

LES LONG'S

WIMPY

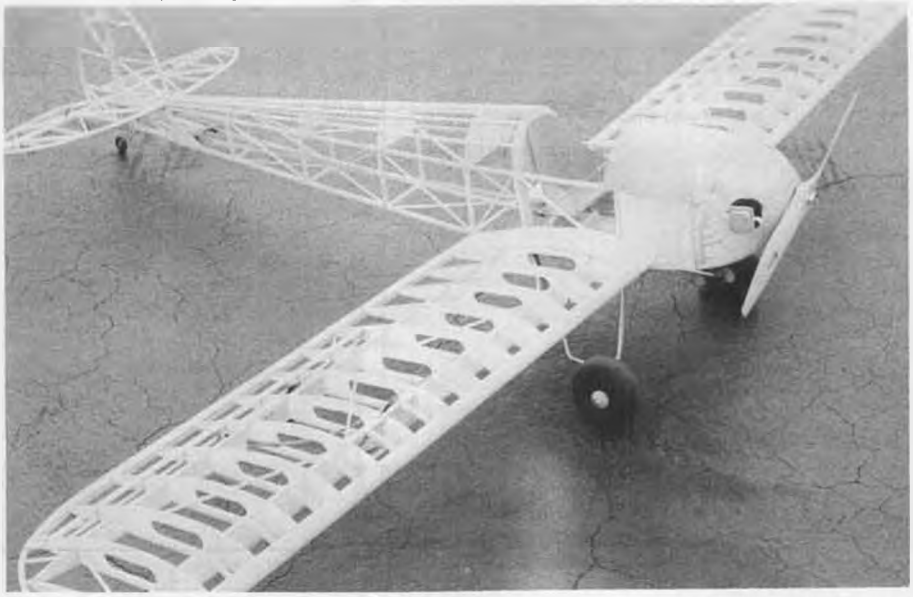
By LE GRAY . . . Large scale models need not be heavy and/or fly with monster engines. The Wimpy, as built from Le's plans by Curtis Christen, weighs under 8 lbs, with electric power. This is Mammoth Scale!

• Wimpy is a lightplane creation by Oregonian Les Long that was almost a half-century ahead of its time. A grass-roots vehicle of the mid-thirties, Wimpy is a design that still warrants serious consideration by the homebuilding enthusiast. It is an interesting and functional machine, quite in keeping with today's needs for an inexpensive sport/recreational airplane.

The basic welded steel tube fuselage is of straight line geometry. Landing gear struts are a welded continuation of the fuselage structure and offer no shock absorbing qualities. Rather, they provide an inverted pylon as anchor for the wing's flying wire braces. Landing shocks were absorbed . . . hopefully adequately . . . by large, low-pressure tires. Piper's Vagabond and Pete Bower's Fly Baby utilize similar solid strut/air wheel shock systems.

The Wimpy wing was of classic, wooden construction. External wire bracing was simple and light compared to more conventional tubular struts or cantilever construction. Drag? Who cares at 80 mph? Strength? The Ryan ST and PT-20 and -22 series utilized an almost identical arrangement, and they were fully aerobatic.

Wimpy was undoubtedly planned around a contemporary air-cooled powerplant. Most likely candidate would have been Long's own Harlequin, a 30-hp opposed twin incorporating cylinders from a Harley-Davidson motorcycle engine. Another candidate would have been the twin-cylinder Aeronca engine offering from 26 to 36-hp, depending on the model. Even the new, single-ignition, four-cylinder Continental rated at 37 hp would have been available. Any of these would have been exciting possibilities to the lightplane designer of the 1930's, but they must have been heavy. Just look at the short nose moments of the various aircraft that they powered: Aeronca C-2 and C-3, Heath Parasol and Mid-Wing, Long's Longster and Wimpy. But still, what an improvement compared to converted Ford Model T or A engines . . . or the overly expensive but unreliable imports of the day.

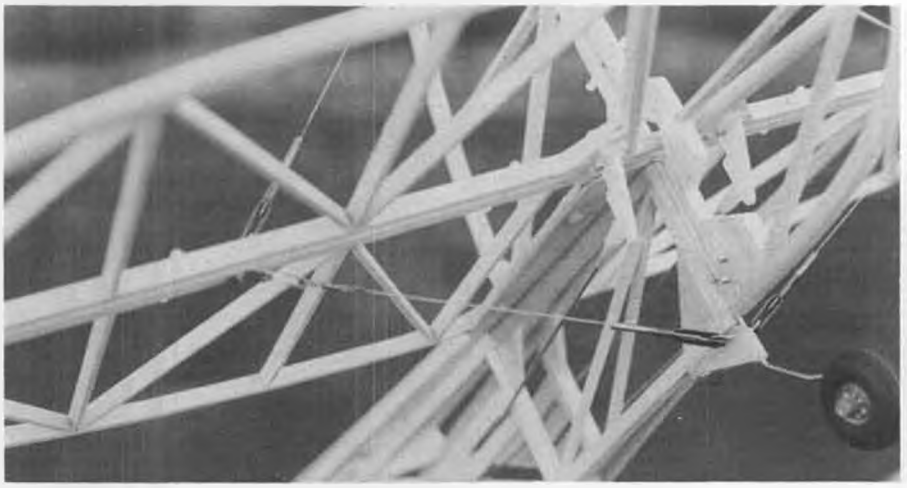


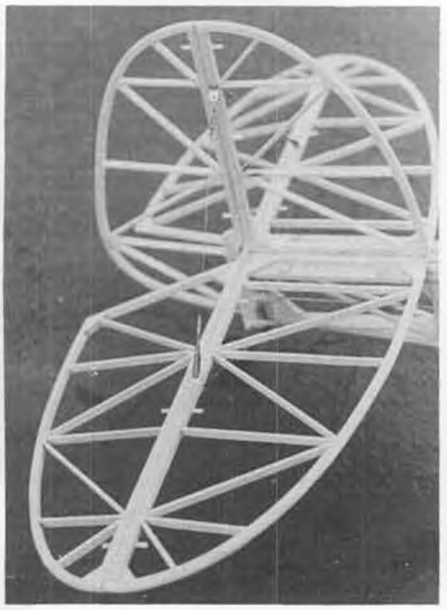
Simple, straightforward structure is evident in this pic. Lightness is a primary concern when building this model, especially when electric power is used; 7-1/2 lbs. is max.

The few published photos of the Wimpy confirm that several were built. Different powerplants were used, and no two installations or cowlings are alike. Some variations in fuselage form also can be noted. One example utilized a rear turtledeck of a rather extreme half-ellipse, almost triangular cross-section rather than the more common semi-circular bulkheads. Another interesting version featured a higher turtledeck that came forward to a fully enclosed cockpit. Nothing fancy, just straight lines from the fuselage station immediately aft of the cockpit to immediately forward of the empennage. It seems that full-scale homebuilders are much like modelers . . . each believes he can improve any design.

As with many of the successful early homebuilts, Wimpy features a high aspect ratio wing with resulting low span loading. This sailplane-like characteristic is common with Heath, Aeronca, and other Long designs, and provides reasonable flight performance with relatively low power. An ideal format for electric-powered Quarter Scale.

Development of the associated plans, working primarily from Walt Mooney's Half-A free-flight version published in *Model Airplane News*, September, 1954, was a fascinating project in imagineering. Assuming Walt's three-view arrangement was basically accurate and utilizing available photos, published specifications, and other examples of Long's work, we tried to visualize what Long's thought pattern or reasoning





Tail structure (above and right). Laminated outlines make it strong, light, and add to the scale appearance. Wire bracing is functional. Four bolts hold stab to fuselage.

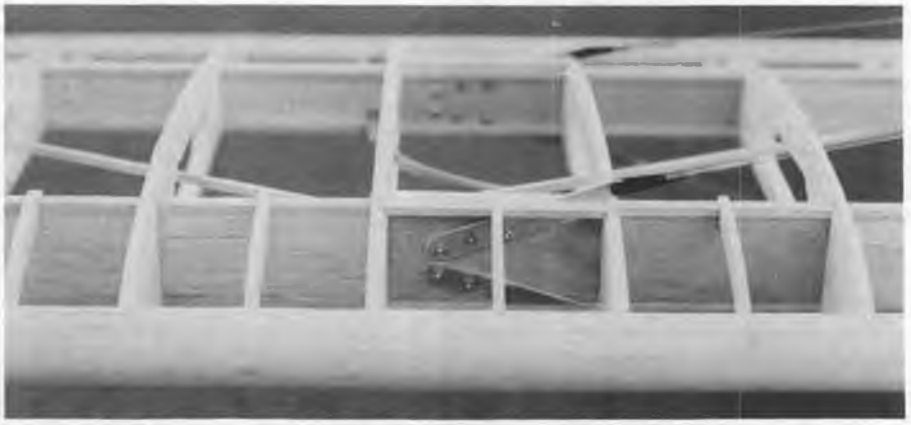
might have been when he was laying out the original design. Undoubtedly, major dimensions would have been in nice, round numbers with logical spacing for components. Would a man in a barn some 45 years ago, designing with yardstick in hand, lay out structural elements on 17-1/2 or on 18-inch centers? We assumed the latter to be more plausible, and made our drawings accordingly each time an option was encountered. Interestingly, components and major structural positions seemed to fall into place . . . as if we were right. Really right. Actually gave a weird feeling at times.

The plans presented are believed to be a fair representation of what the actual structure might have been . . . or, more reasonably, could have been. Now, this bit of homey philosophy might be tough to sell to some hard-nosed scale judge, but this is for fun. And it *is* fun!

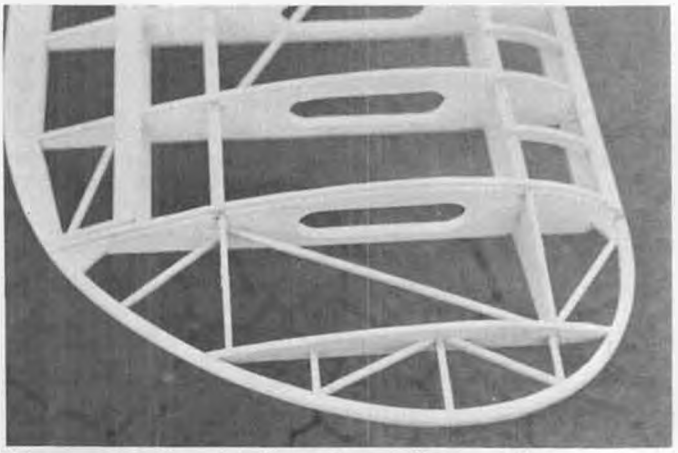
Certain details in the photos are not consistent with the drawings. Simple explanation: the plans incorporate changes/improvements resulting from the prototype model. A major item to keep in mind is weight . . . minimum weight. With the electric motor/propeller specified, 7-1/4 lbs. is the absolute maximum for safety. And 3 lbs. thrust . . . that's "pull" measured with a fish scale hooked to the tailskid . . . must be available at takeoff.

From the instant the tail came up on the first takeoff run, flight performance of the model Wimpy has been the most beautifully realistic we have ever witnessed. Absolutely fantastic. Les Long obviously knew how to lay out an aerodynamic force arrangement that was right or "right on," depending on your date of birth. No adjustments or changes, other than a minor weight reduction program to reduce from 7-1/2 lbs., have been made. We did try an 18x8 prop on one flight. Don't.

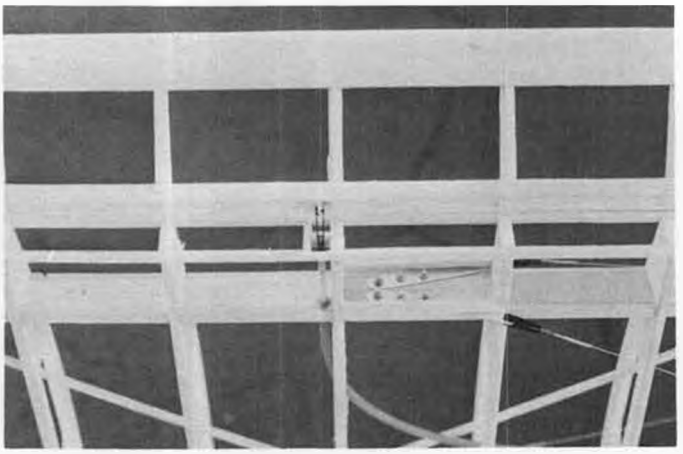
If you elect to power Wimpy with an internal combustion engine, there is ample margin to strengthen the front end of the fuselage to handle all that vibration and such. Better to build in beef than to take dumb lead ballast for an airplane ride. Our electric power system installation totaled 3-1/2 lbs., so a more conventional engine installation should allow a couple of pounds to be put into the structure. A large (.45 to .60) engine would be all right if overpropped to reduce power and add to realism. Little propellers look dumb on big scale



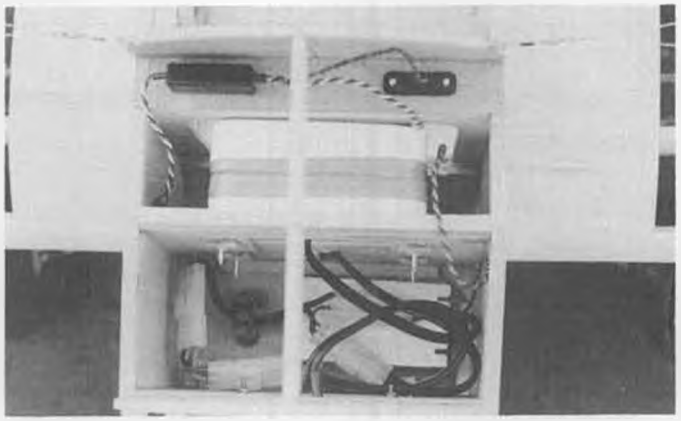
Wing bracing wires use spring steel pushrod clevises to connect to metal fittings, which are in turn bolted to a plywood shear web between spars.



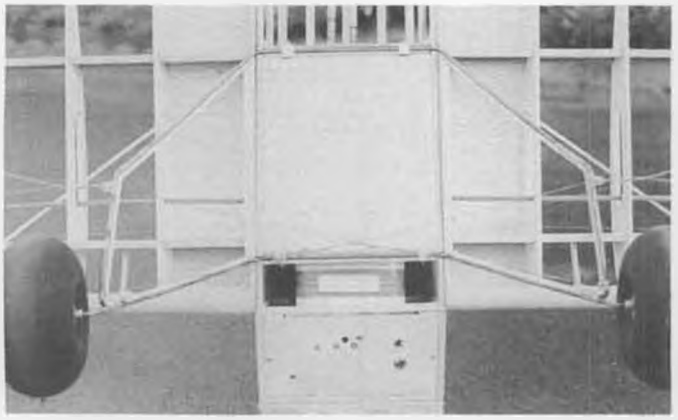
Wing tips are laminated similar to the stab. Ribs on original model are Foamcore with balsa cap strips. Note inset spars.



Flexible plastic pushrods are used to drive the ailerons . . . lighter and simpler than solid pushrods and bellcranks.



Astro 25 battery packs are placed one on top of the other between ply bulkheads, motor speed control in front of batteries.



Landing gear is held on with metal straps and screws. Gear is wire braced and rigid; Trexler airwheels provide shock absorption.

models, anyhow. Actual power requirements demand nothing more than the output of a healthy .29. Please don't make a bomb out of Wimpy by overpowering. Its big, thick wing section just begs to loaf through the air . . . low, slow and easy. Maybe a steep turn or a slow-motion type loop, but go easy on the aerobatics. Try spot landings, instead.

The Wimpy flies by forward thrust pulling a lifting surface through the air to overcome the forces of gravity on a given mass. This will be a surprise and a bit of a challenge to modelers used to high power/weight ratios. Wimpy's power/weight ratio is just slightly higher than a Schweizer 1-26, so relax and fly in the real and realistic sense. Just like Quarter Scale oughta be.

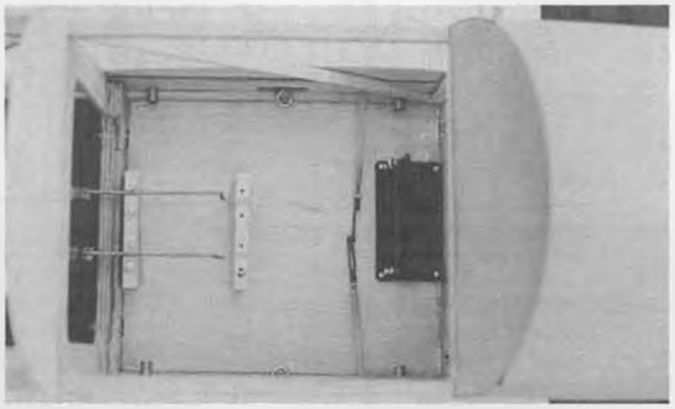
CONSTRUCTION

The construction techniques used in building Wimpy are very conventional and simple. It is to be remembered, however, that this is an electric model and must be built as lightly as possible. Select all wood either for strength or weight, depending upon use in the structure. The top and bottom fuselage longerons should be straight, hard balsa. Use epoxy only where absolutely necessary and Titebond and Hot Stuff or equivalent wherever possible.

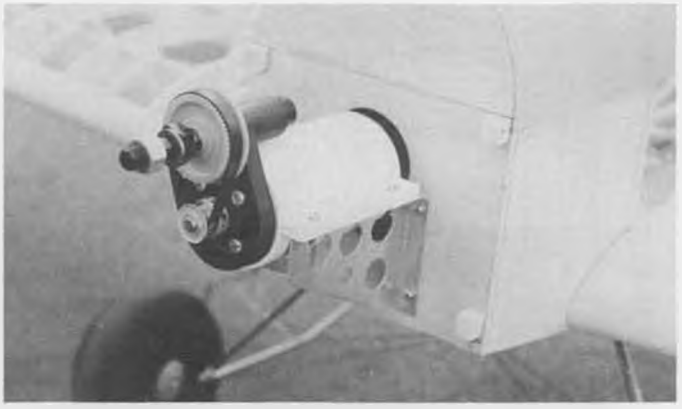
Begin construction by cutting templates for tail surfaces and wing tip outlines from foam board. Laminate outlines from medium 1/16x1/4 balsa. Lamination strips may be glued together wet or dry. Either works equally well.

Make a 3/32 or 1/8 plywood wing rib template with all notches, lightening and root rib mounting holes. When cutting foam board wing ribs, use only a sharp blade. Otherwise, you get a lot of paper covered, crushed foam. Take special care to get a good fit on all joints and spar webs, as this requires less glue for maximum strength. Foam board, known commercially as "Foamcore" and other names, should be available at well-stocked art supply stores or departments.

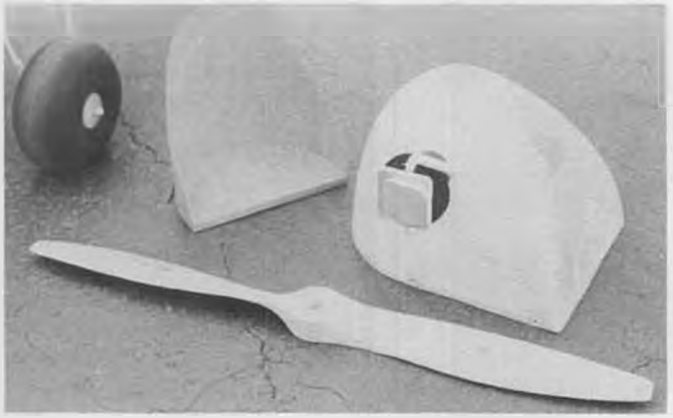
Fuselage construction starts by making two side structures directly over the plans and each other. Continue framing directly over fuselage top view with sides inverted. Add all bulkheads, frames and diagonals possible while anchored in this position. When dry, remove from board and add turtledeck formers and stringers, stabilizer mounting plate, and



No shortage of radio mounting room in the Wimpy! Note the 1/4-inch tubes that locate wing to fuse, also hooks for rubber bands.

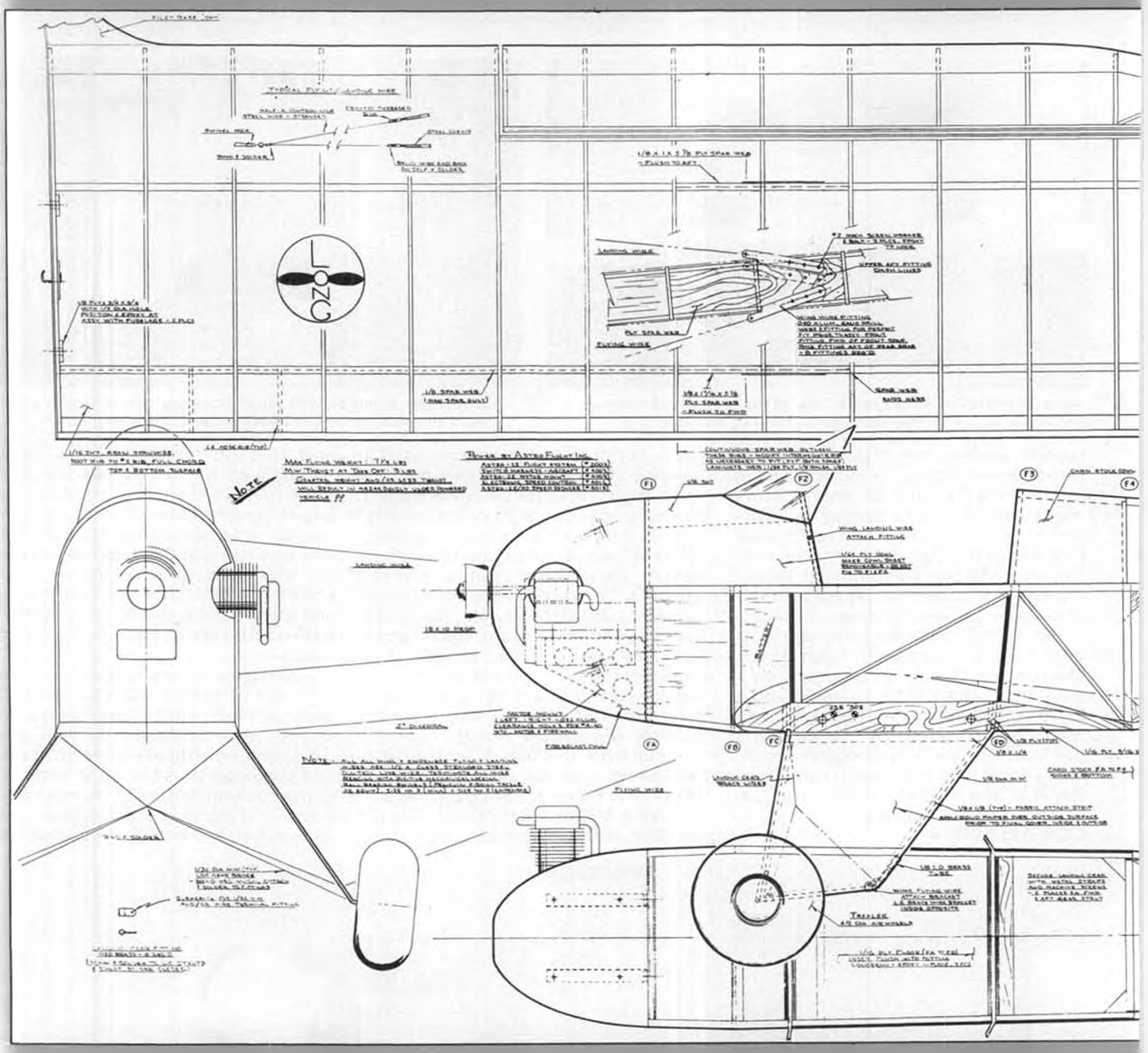


Astro 25 with speed reducer fits into Astro Flight mount, then bolted to homemade aluminum bearers. Swings 18 X 10 prop.



Cowl is fiberglass, made over a foam plug, or carve one from black balsa if you prefer. Pilot's seat can be made from 1/64 ply.

All set to go flyin'. Original model was finished in cream and maroon Monokote, recommended for strength and light weight.

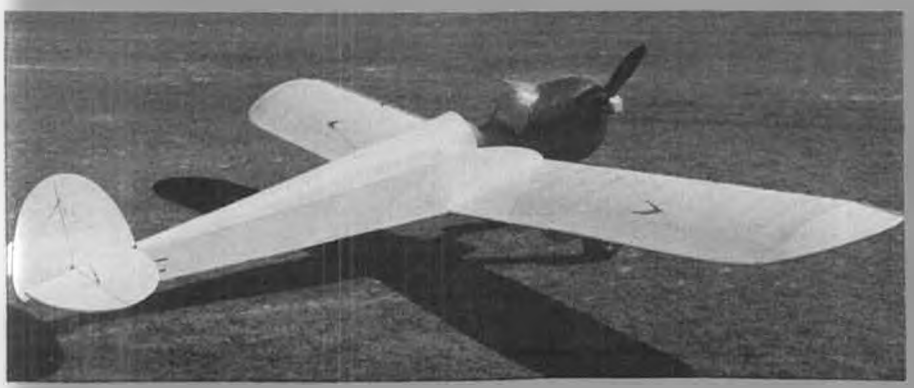


FULL SIZE PLANS AVAILABLE – SEE PAGE 108

other details.

Bend landing gear components, wrap all joints with one layer of one strand from Half-A control line wire, and solder. Mount to fuselage, checking for true alignment.

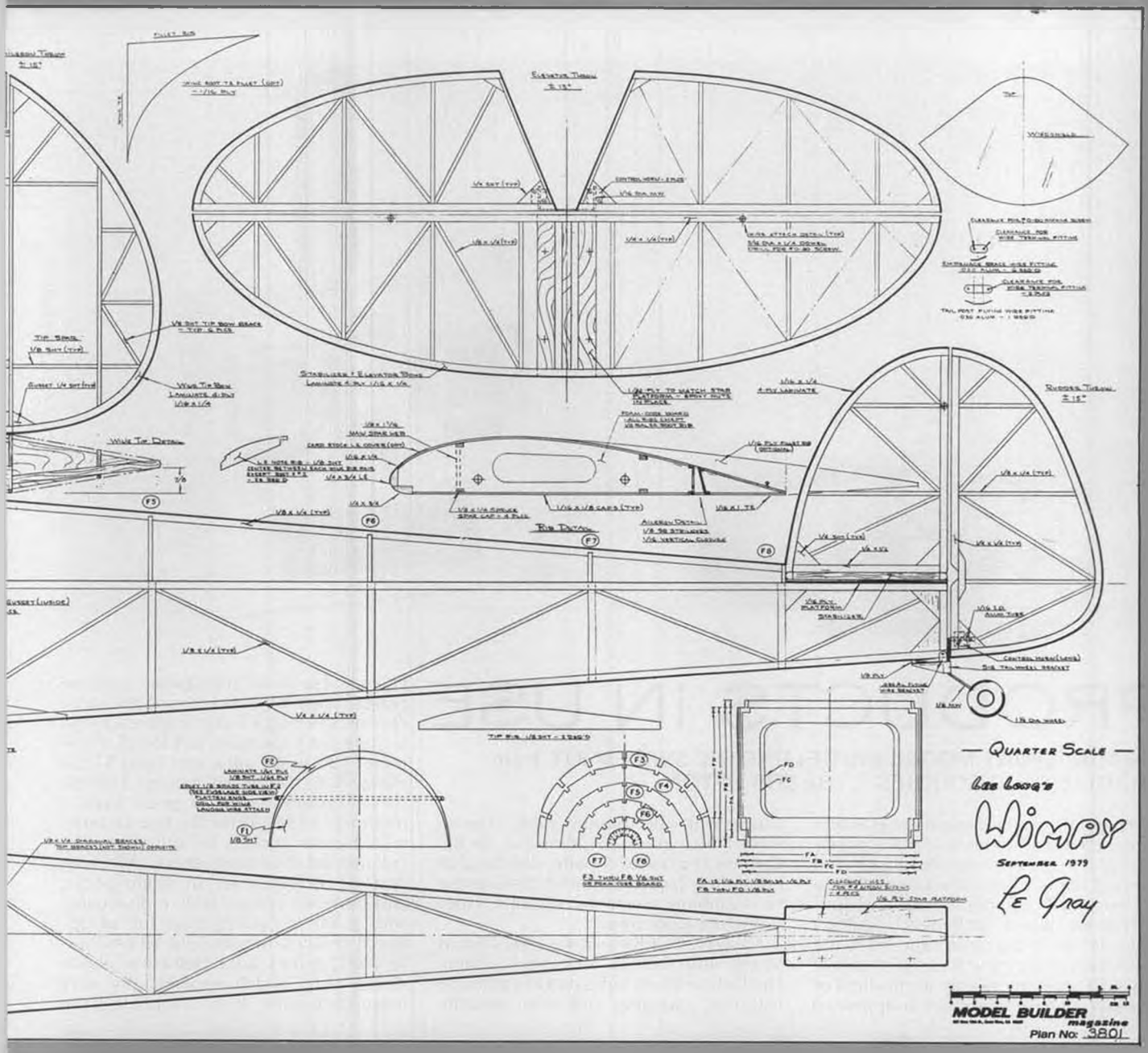
Mate all flying surfaces to fuselage with care to proper fit and incidence. Fabricate the flying and landing wires and fittings per drawing, and carefully rig surfaces. Remember, the wire braces are functional and carry flight and landing loads. Check control surface movements for values noted on the plans.



One of the reasons the Wimpy is so easy to fly is the long tail moment. Now you can see why it is so important to keep the tail as light as possible, and keep all the heavy stuff forward.

The engine cowl is fabricated over a foam plug carved to match the fuselage. Use one layer of 2-oz. fiberglass cloth and three coats of epoxy, sanded between coats. Motor cylinders are made from file folder card stock and balsa.

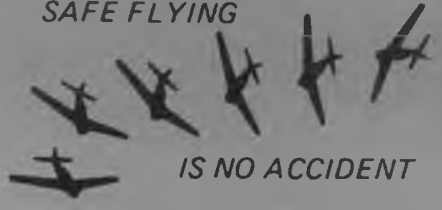
The radio flight battery may be eliminated by building a voltage regulator to run from the motor batteries. Use two 5-volt, 1-watt, 3-lead regulators (Radio Shack No. 7805) in parallel. These regulators must be attached to the motor mount, in the airstream to provide a heat sink. This alternate power source will supply at least five minutes for the radio system after the batteries will no longer drive the flight motor.



The completed model should not weigh more than 7-1/2 lbs., and lighter is better. Check the balance and shift battery and radio equipment as necessary to fix the CG between 25 and 30 percent of wing chord. The original cream and maroon model was covered with Monokote, which is recommended for maximum strength and minimum weight.

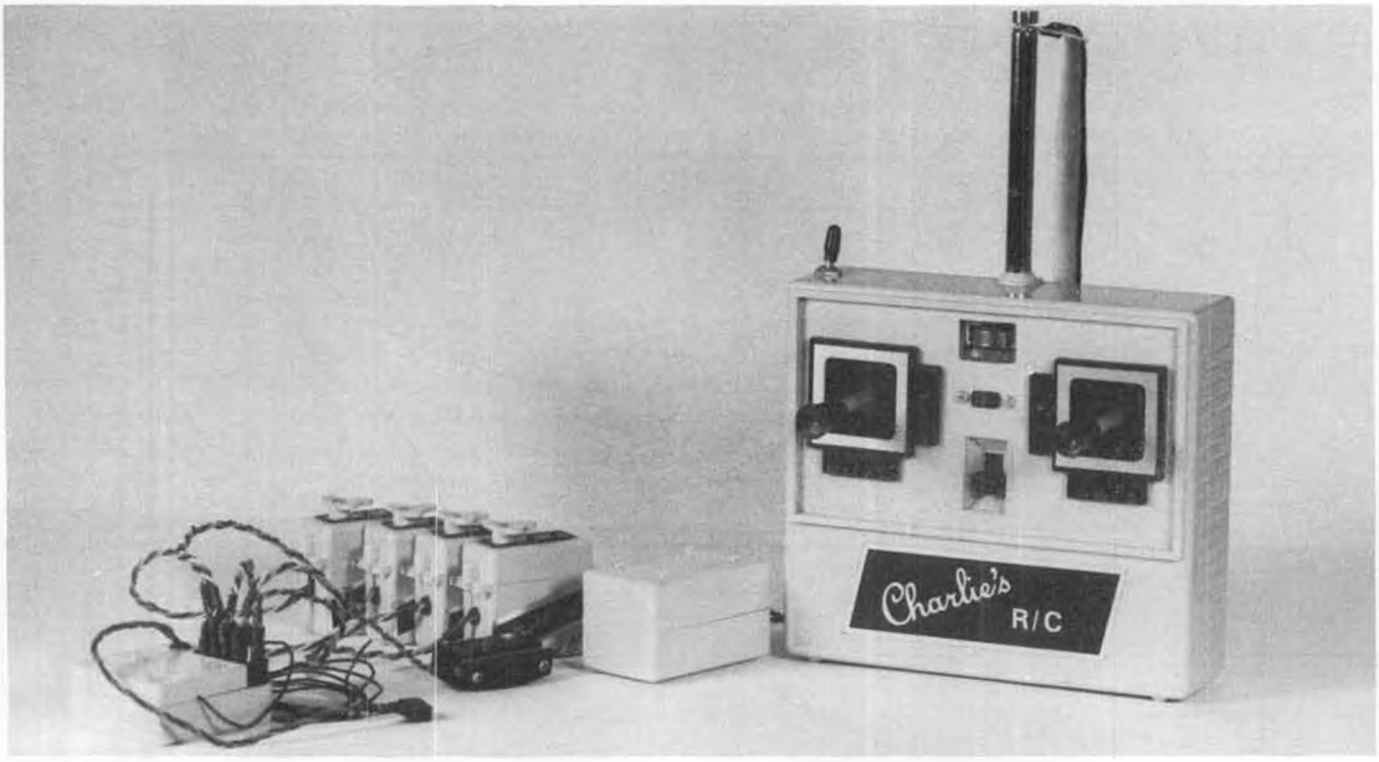
Flying the model is somewhat unconventional. It is very slow and realistic and not at all like most powered models. Let Wimpy fly its own way . . . climbing on wing lift rather than prop blast. We think you'll enjoy. •

SAFE FLYING



IS NO ACCIDENT

At 7-1/2 lbs., Wimpy is definitely not a windy weather model. But the light weight permits slow, realistic, enjoyable, *safe* flights. It's the way a Quarter Scale model *ought* to fly.



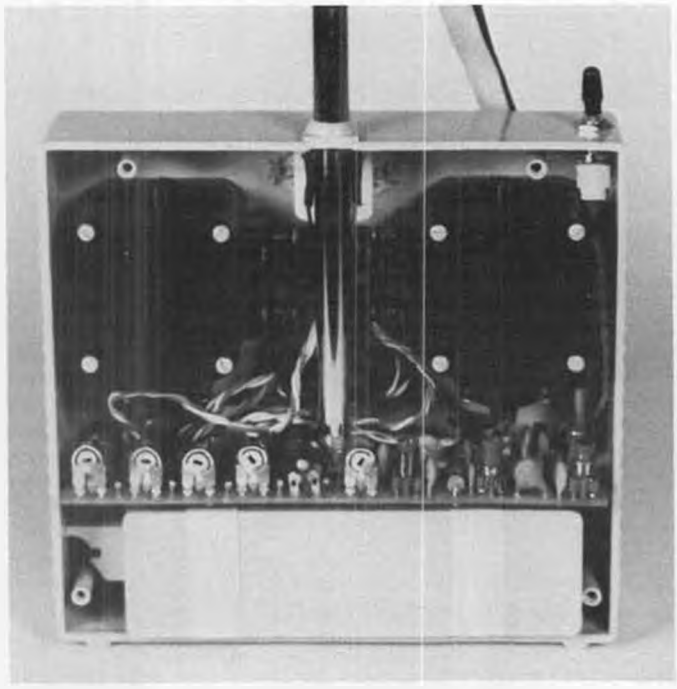
PHOTOS BY BILL NORTHROP

PRODUCT$ IN U$E

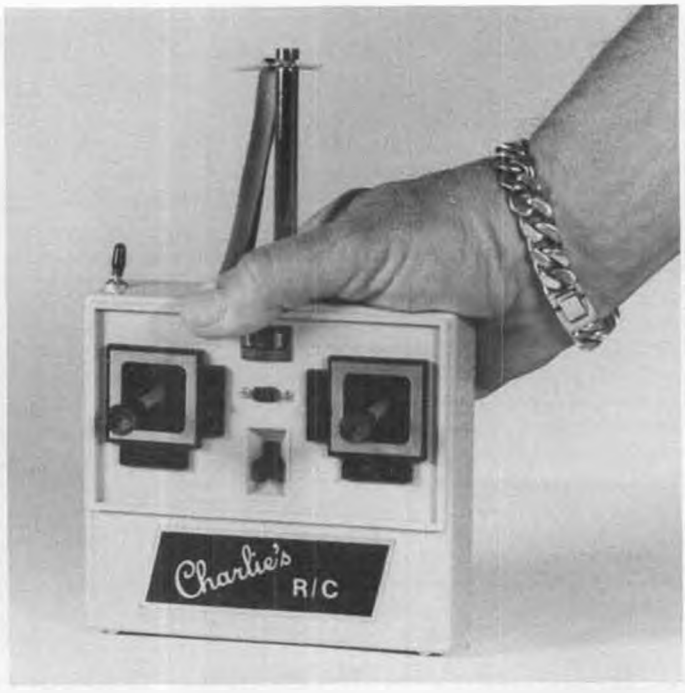
The MINI-SPORT MODEL 810 DELUXE R/C SYSTEM KIT from CHARLIE'S R/C GOODIES . . . By BOB UPTON

• Having flown (and taken for granted) many different radio control systems over the years, the opportunity offered me by Charlie Cannon to assemble one of her new "Charlie's" radio control system kits was a challenge I couldn't resist. While I have been exposed to the mysteries of electronics, compliments of the Air Force, my talents in this field of technology have long since disappeared (along with the vacuum tube). Therefore, I was quick to point out to Bill Cannon and his lovely wife, Charlie, that I definitely lacked any kind of expertise in assembling electronic systems, especially miniature ones!

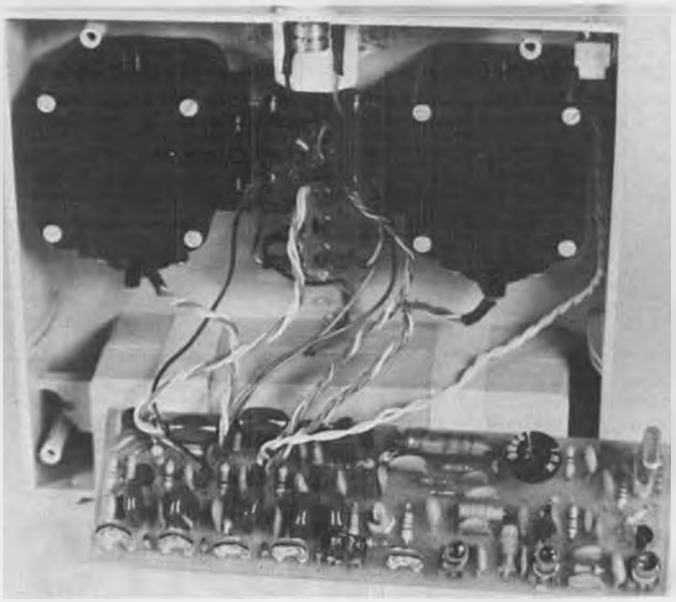
Anyway, Charlie sent me a Mini-Sport Model 810 Deluxe 5-channel system. The Deluxe kit includes nickel-cadmium batteries, charging jack and separate charger for both transmitter and receiver. With the exception of the same system featuring a 3-axis single stick, this is the most expensive, at $164.95, complete. The single stick unit costs $12.50 more. A 4-channel kit sells for $159.95. Other systems range in price from a minimum of $84.95 for the two-channel with 2 servos and dry batteries (uses dry cell instead of rechargeables). All transmitters, receivers, servos, flight packs, and batteries are available individually, with a whole catalog page full of optional choices. Incidentally, all of Charlie's R/C radio kits for 1980 are available direct only, which explains the very reasonable prices. If you should lack the



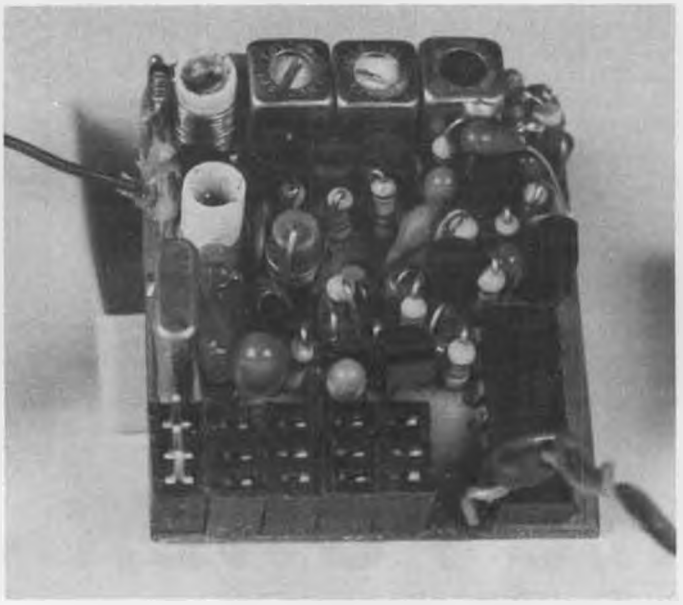
Compact arrangement of components in the very small transmitter. Battery case holds 8 pen-cell nickel-cadmiums.



The editor's paw provides positive proof of the transmitter's diminutive size. Note Dunham sticks, recessed switch, 5th channel toggle.



RF portion of P.C. board (rt) comes built and factory tuned (don't touch!). You finish board, build stick units, and add wire harness.



The receiver components are just a bit snug, but after warming up on servos, it's not that tough. Magnifying glasses do help, though!

spirit of electronic adventure, the systems are also sold built and tested for only a small additional amount. For example, this 5-channel set goes for $189.95, only $25 more than the kit. The 4-channel built unit sells for only $183.95. Write to Charlie's R/C Goodies, 13400-26 Saticoy St., North Hollywood, CA 91605 for a complete list of items available for 1980. As I've had a technician's license for many years, I asked Charlie to send me a system that would operate on 53 MHz.

The kit comes in three basic sections (servos, receiver, and transmitter), with assembled sticks, cases, mechanical parts, Deans plugs, and wiring, for a step-by-step assembly of printed circuit boards and mechanics into a complete, workable system.

No test equipment is necessary for final calibration and adjustment, as a preassembled and calibrated servo for use in a simple logic alignment procedure is included with the kit.

A thorough and well illustrated, step-by-step instruction manual is included for each of the basic components (only one servo manual, dummy, they're all alike!). Each manual includes a list of the kit parts, layouts of the printed circuit boards, tuning instructions, trouble-shooting hints and charts, illustrated component identification (great!), and wave form patterns (for those who understand them).

SERVOS

I tackled the servos first, as it is recommended that this be the starting point, especially when one assembled CE-4 servo is provided in the kit as a guide. Each servo is assembled from electronic components, neatly packaged in plastic bags, and is complete in every detail including a generous amount of the proper Rosin-core solder. I was immediately dismayed by my first glance at the tiny size of the servo P.C. board, and reasoned that there, ". . .ain't no way all that stuff is going to fit on the P.C. board!" (Packaging of components in Cannon's even smaller CE-9 servo staggers the brain!) I found my basic problem was not so much the P.C. board and associated components, but my inability to see properly at close range. (It's hell to get old!) I solved this problem by "borrowing" from Bill Northrop a neat head-mounted magnifying device similar to a welder's eye shield (now he knows why it disappeared). This device, coupled with a short focal length eye loupe, enabled me to build the servos with some degree of confidence.

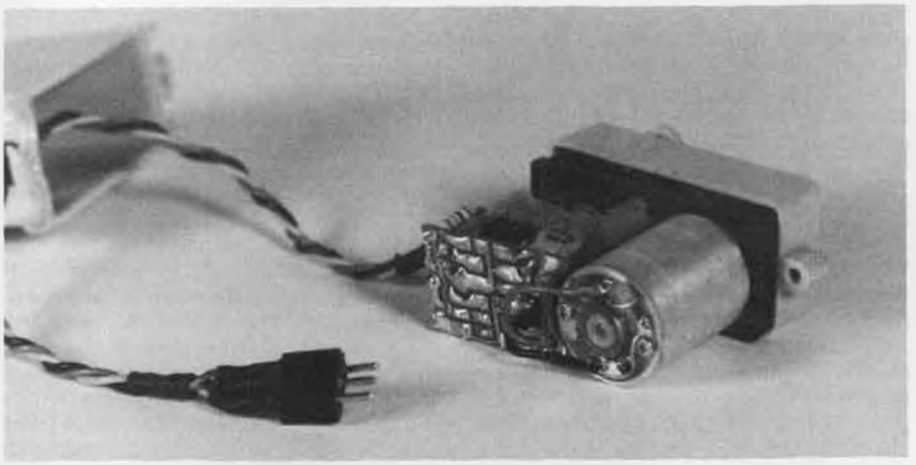
The first servo wasn't the most esthetic thing you would want to look at, but it was basically sound and all the solder joints appeared to be good. Wonder of wonders, it fit in the plastic servo case without overstressing anything! After much tedium, worry and sweat with this first servo, I had the feeling I was assembling the thing with a pair of boxing gloves on! (Yeah, I broke a resister lead by my ham handiness.) Believe me, I now have *great* respect for those talented individuals who assemble electronic systems for a living and make it look easy. By no stretch of the imagination, is it easy! Anyway, the third and fourth servo went together with much less time and effort.

Careful attention to the instruction manual is very important. Read it over several times before you start, and follow, to the letter, each sequential step, and you can't go wrong. I can appreciate the difficulty of communicating a set of instructions to someone else, especially in writing, since my business requires me to write and prosecute patent applications. Bill and Charlie have done a remarkable job of teaching the fledging electronic assembler how to build an R/C system. As I've stated before, follow the instructions and you will be rewarded with success! Enough illustrations and diagrams are provided in the instruction sheets to remove any doubts, and of course, the factory pre-assembled servo helps a lot.

RECEIVER

Flushed with renewed confidence, the receiver P.C. board was laid out on a clean spot on the workbench and each of the transistors, resistors, and capacitors was identified and checked off the detailed parts list. I might digress here a

Continued on page 103



One down and two to go! (One servo comes assembled and calibrated. It is used for non-instrumented calibration of the completed system). Deans solderable connectors handy for repairing.

PHOTOS BY JAY SELBY

Winners of the 1979 O.P.C. Championships at Lake Spreckles, in San Francisco, were (l to r): Steve Hamilton, first; Rick Barry, second; and Dave Grainger, third. Held on November 17, 1979, the event was directed by Wendy and Tom Feist. Eleven tunnels competed.

R/C POWER BOATS

By JERRY DUNLAP

• It's difficult to get excited about model boating when I look out of my office window at 4:30 in the afternoon and it's dark and the rain is pouring on the streets. I suppose I should think positive thoughts about how all that rain will fill our pond so we'll have water to race on when April finally arrives. Have you ever had your racing site dry up on you? It has almost happened to us. Since our race site is going to be the location for the 1980 NAMBA Nats, it might be nice if there were some water available come the first of August. Yes, I do believe I'll be more positive. Come on, rain. Fill up that pond.

GOOD OL' JAY COMES THROUGH

Anyone who actively follows model outboarding knows that Jay Selby, of Redwood, California, is one of the leaders in model outboard tunnel racing. Jay is also a model boat writer, and his articles appear in *R/C Sportsman*. I recently sent down some information for his column and he returned the favor by forwarding some results of two model outboard regattas held during the month of November at Lake Spreckles in San Francisco's Golden Gate Park.

The 4th Annual Golden Gate Outboard Regatta was held on Sunday, November 4. Hosted by the San Francisco Model Yacht Club, it was directed by Art Hammond of the Model Mariners. This is the oldest model outboard regatta annual sponsored in this country. The perpetual trophy was originally donated by K&B Manufacturing back in 1976. There were twenty-four tunnels entered in this year's event. Six hulls were original scratch-built designs, five were Wintunnels designed by Buzz Passarino, four were Mongooses designed by Ken Reilly, four were Steve Hamilton designed Hamiltunnels, there were four Dumas Hot Shots, and one Excaliber. It is of interest to note that the most popular prop was the J.G. C-7, with eleven choosing that type and three using the J.G. C-20 prop.

The actual racing was around a short sprint course with the "M" configuration. It is interesting to note that half of the winners of the Golden Gate Outboard Regatta have been women, as Wendy Feist brought home the honors in 1979. Judy Prigley won the initial event back in 1976. Gary Kyes, a veteran of model car racing, was second, and Wendy's husband Tom placed third. The Feists used Wintunnels, and Gary's boat appears to be a modification of a Klampon Kai. Steve Hamilton turned in the fastest lap, Buzz Passarino won the Concours, and Rick Berry won the 5-minute enduro.

The First Northern California O.P.C. Championship was held at Lake Spreckles, in San Francisco, on Saturday, November 17. The event, directed by Wendy and Tom Feist, was originally scheduled for Saturday, November 3. However, it was rained out on the 3rd and only eleven tunnels were able to attend the make-up contest on the 17th. The OPC Championships is the culmination of a five-race circuit begun in 1979. Races were held in Santa Cruz, Santa Rosa, Stockton, and San Francisco. The contests consisted of heat racing, fast lap, and either 5 or 6-minute enduros or a trophy dash.

The top five finishers for the 1979 Championship Series were: first, Steve Hamilton with 9650 points; second, Rick Berry with 9050; third, Dave Grainger with 8625; fourth, Gary Kyes with 7825; and fifth was Rick Harrison. At the November 17 race, Gary Kyes took the Trophy Dash and tied with Steve Hamilton for Best Driver but lost on a flip of a coin. Steve also managed to win the Hard Luck Award. (It isn't often that you win both the Best Driver and Hard Luck Award.) Dan Jones was awarded the Slowest Lap award. (Another award that is displayed in conspicuous places.) The O.P.C. Drivers presented Jay Selby, the O.P.C. Coordinator, with a live pine tree in appreciation of the time and effort he had given to promote this Championship Series.

PUGET SOUND MODEL BOAT CLUB'S POKER RALLY

Sunday, December 9, was the day the Puget Sound Model Boat Club, Tacoma, Washington, decided to gamble on the weather and conduct a Poker Rally. We came out losers on the weather, as the wind blew in gusts up to 25 mph and most of the event was conducted in rain. However, considering that seventeen model boaters entered at least one of the 5-minute rallies (enduros), the event would have to be considered a winner. For the event, all boats ran together using the LeMans type start and five minutes of running time around an oval course. For each three laps completed, the contestant was awarded one card. The most laps completed in one 5-minute enduro was eleven. This amount was completed by Dennis Caines using a wood Excaliber II and your friendly reporter using his Prather Deep Vee 40 that was reviewed last fall in **RCMB.**

The winners after three hands (enduros) were: Jerry Gruol, running a fiberglass Excaliber II; John Metzger, racing a Klampon Kai; Ron Thompson, racing an original tunnel; and Jerry and Maren Dunlap, racing the Prather Deep Vee 40. Those participating had such a good time that it was decided to take another gamble and schedule another Poker Rally in January. This is a great fun type event requiring a minimum of equipment and supervision. And since the winners are determined by who has the best cards and not who has the most laps, the pots are usually spread around.

HOW ABOUT HEARING FROM SOME OF THE REST OF YOU?

This column is always looking for reports and photos from clubs and individuals about model boating activities. I'm pleased with the fact that some of you have taken the time to send in news from your area. Such information can be sent directly to Jerry Dunlap, 119 Crestwood Dr. S.W., Tacoma, WA 98499, or R/C Power Boating, c/o **RCMB,** and they'll forward it to me.

A SMALL INCIDENT THAT MADE ME FEEL GOOD

The story I'm about to share has probably happened many times before in other shops and places, but I found it to be most heartwarming. While on a business trip to Oregon, I took a few minutes to drop in and visit with Ken Thorstad, owner of Hobby Land in Portland, Oregon. I've known Ken for over a dozen years and always enjoy stopping by his shop on Interstate Avenue to discuss the hobby business.

While I was talking with Ken, a young customer, a lad about eleven or twelve, came in to purchase a plastic airplane model. He found one he liked, but could not find the price marked on the kit. Bringing the kit up to the counter, he asked Ken the price of this particular model. Ken looked at the box and stated that the kit cost $1.75. Digging deep into his pockets, the young lad managed to gather up a total of $1.25. It was with a great amount of disappointment that he announced he only had $1.25. "Today must be your lucky day," Ken informed him. "This kit is on sale today only for $1.25." The smile on that youngster's face and the look in his eyes could not be expressed in dollars on the cash register.

As a youngster growing up loving to build model boats and airplanes, I spent lots of time in hobby shops. It's things like what Ken did to help that young modeler that makes that time seem very precious.

NICE GOING, READERS, I'M GETTING QUESTIONS ABOUT MODEL BOATING

I really am pleased with the response readers of this column have made in sending in questions. I am attempting to answer all the questions promptly. Those self-addressed, stamped envelopes that some of you have enclosed with your letters are especially appreciated. Another thing that would help is the placing of your return address somewhere in the letter. I managed to discard an envelope from one person who wrote, and that was the only place with his return address.

Rich G., from Northfield, New Jersey, writes: "I've just completed reading the article you wrote in **R/C Model Builder,** November '79. The article was good, considering you don't find that many boat articles around.

"My father and I run the 1/8-scale gas cars, and I thought I would try a boat as long as I have the radio. I was hoping that you would know of any subscription magazines, just on boats, so I could get some information before I got into it. If you could, please send me the addresses, if any, so I could order them."

Right off hand, I don't know of any "Boat Only" publications being printed here in the States. *Flying Models, Model Airplane News, R/C Sportsman,* and *R/C Modeler* have a boating section each month. I would think the .21 deep-vee class or .21 outboard class would be a good class because of your experience with that size engine. You might already own a K&B .21, and that's a very popular engine in the deep-vee class. The outboard class is also becoming very popular.

Like Rich, many people just getting interested in model boating wonder why there isn't a magazine just for model boaters. Allow me to take a few lines and shed some light on some possible reasons. I was the editor of a "Boat Only" magazine back in 1972 and '73. It's not something I'd do again unless things were much different. The biggest problem is making *any* magazine, not only a hobby magazine, pay for itself. Putting out a magazine is very expensive. It's not the readers who keep a magazine in business, it's the advertisers. Knowing that most magazines fail within the first two years, advertisers are reluctant to commit advertising dollars. Without dollars, you can't publish. And compared to the number of people interested in model airplanes, the number of model boaters is small. I'm much happier as just a staff member of a model magazine than I ever was trying to be the editor of a model boating publication.

Don D., of Aurora, Illinois, writes: "I have decided to get into boating with the outboard tunnel hull. I have Steve Muck's 'Lil Lightning,' and the plans for your Excaliber II should be here shortly. By the way, thanks for those plans. I am an old scratch builder. Being new, I need some answers. 1) To move the weight forward on your Excaliber II, what is wrong with moving the complete radio/battery/servo package all the way forward? With very little rework of the front cowling, the entire package can be put against frame no. 1. 2) I plan to use a push-pull system for steering using a Masterod-XF flexible cable pushrod. To eliminate the pushrod seal, what is wrong with epoxying the outer jacket of the Masterod to the end of the radio box? 3) On page 24 of the December **R/C Model Builder,** there is a picture of your Excaliber II. The engine head has been rotated 90 degrees, putting the

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Winners of the 4th Annual Golden Gate Outboard Regatta, also held at Lake Spreckels, were: Wendy Feist, first; Gary Kyes (left), second; and Wendy's husband Tom, third.

Special event winners at the Golden Gate Outboard Regatta (l to r): Concours winner, Buzz Passarino; Steve Hamilton, who turned in the fastest lap; and Rick Barry, 5-minute enduro winner. As for Hamilton's facial expression, all we can say is . . . same to you, fella!

The P-1B, subject of our drawings, had larger wheels than earlier Hawks and redesigned radiator and cowl. Color was khaki overall. This one sports a new Air Corps number, but the rudder still has Air Service red, white, and blue vertical bars.

CURTISS P-1B

By PETER WESTBURG

PART ONE

• If airplanes had parents, the mother of the Hawk would be Curtiss and the father would be Boeing.

Trying to determine what happened behind the scenes of that forced marriage is like prying open the lid of a six-foot bungalow and finding only a few scattered bones. However, some facts are known. Curtiss began the design of a new post-war pursuit, water-cooled, in May of 1922. The first of three prototypes flew in January of 1923 as the XPW-8. It had a 440-hp Curtiss D-12 engine and long, thin, constant chord wings with two bays of N-struts and a few hundred .004-inch thick brass tubes soldered together on the top surface of the upper wing to make a radiator, the same cooling system used on the Curtiss racers. A production order for 25 PW-8's followed; meanwhile, the third prototype was reengineered with shorter, thicker wings, a single bay of struts, and a core type radiator in the upper wing similar to the Albatross of WW-I.

The marriage was consummated in 1924 when a competition was held for a new fighter contract. A fighter arrived from an upstart company in the northwest to challenge the XPW-8A, the Boeing XPW-9. The Boeing fighter was also powered by the D-12, but it had two distinct advantages the XPW-8A lacked. The first was a tunnel radiator under the engine, much improved over the McCook Field design of the 1920 PW-1. The second was tapered wings.

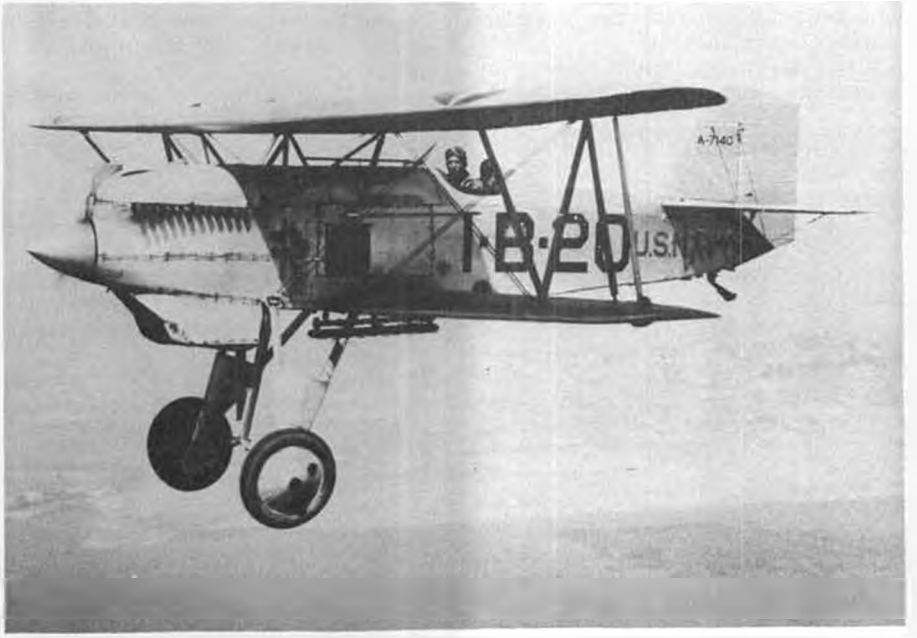
To get rid of the troublesome core radiator which sometimes spewed hot water on the pilot, and the movable radiator vanes which changed the flight trim of the airplane, Curtiss copied the tunnel radiator. Top speed of the racer-like XPW-8A was 178 mph, but with the tunnel radiator this dropped to 162, only one mph better than the XPW-9. Unfortunately for Curtiss, the maneuverability of the straight-winged XPW-8A was considerably less than that of the Boeing fighter with its tapered wings. McCook asked Curtiss to put tapered wings on its pursuit.

"Do you take these tapered wings to mate with your fuselage?" they asked.

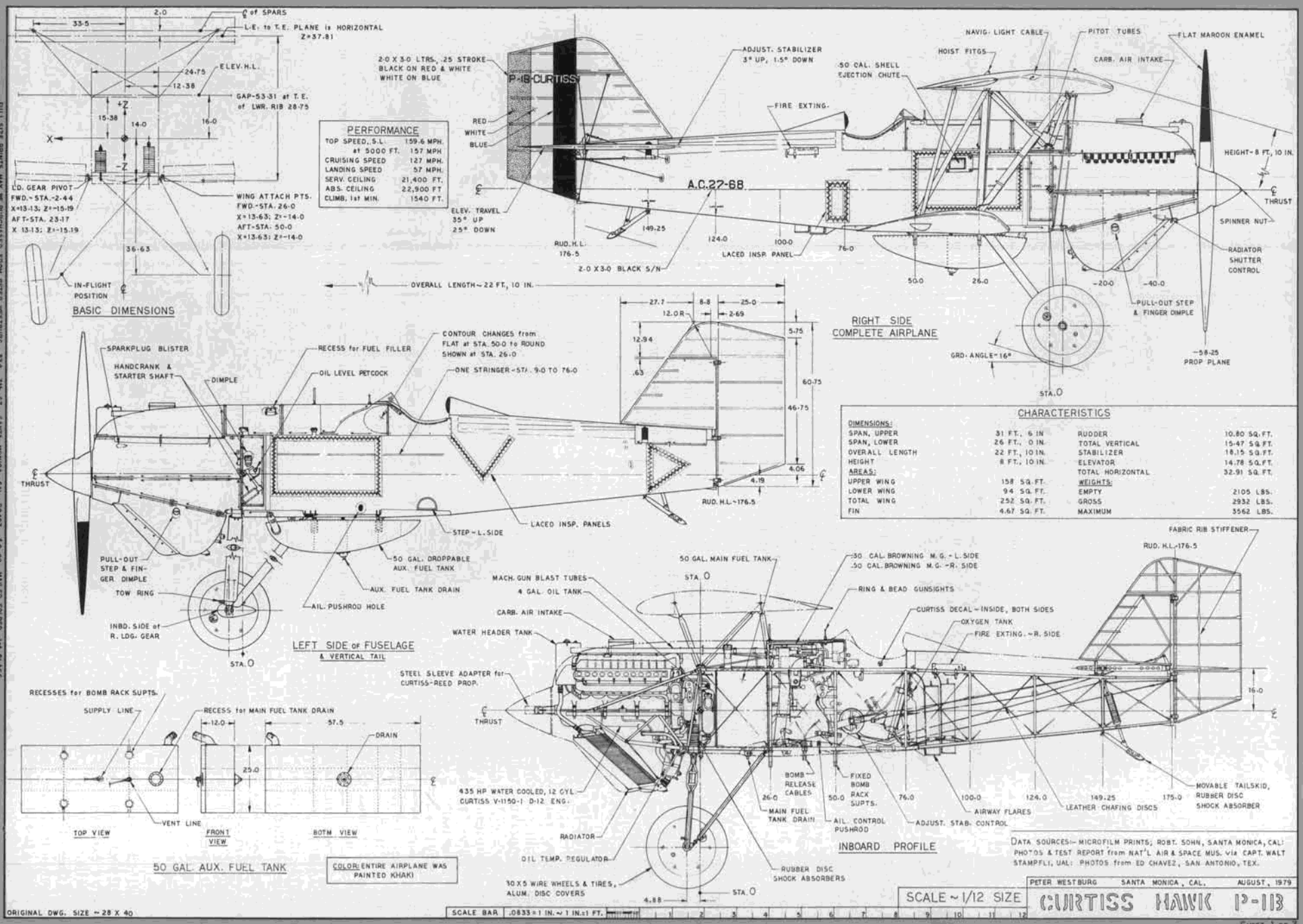
"I do," replied Curtiss.

Shortly thereafter, under a new numbering system, the famous Hawk was born. George Page, the Curtiss engineer who had much to do with the design of the tapered wings on the Hawk, once admitted that the Boeing wing was the "inspiration" for the design.

Thirty-one Hawk AT-5A trainers with Wright J-5 engines proved unsuccessful; 24 were converted to P-1F's with D-12 engines. Photo by Ed Chavez.



The Curtiss F6C-3 of 1928 was the Navy version of the P-1 Hawk with the earliest tunnel radiator design. Photo by Marion Hoblit.



A really nice shot of Larry Baker's beautiful large-scale DG-100 all set up for landing, spoilers up and gear down. This and most of the other Soaring photos this month were sent in by Keith Thomas at a recent scale glider contest in England.

R/C SOARING

by Dr. LARRY FOGEL.

PAGE 30 & 31 PHOTOS BY KEITH THOMAS

• Let's share the pleasure of an English countryside through the eyes of Keith Thomas. He writes, "The West Mendip Scale Competition was recently held at Crook Peak in Somerset. You reach the soaring site by climbing a long and very steep trail. Nobody climbs the Peak twice on purpose . . . so if you leave your transmitter in the car . . . you've had it! Before the event started, the wind changed, making it necessary to move to another slope. Then the rain came . . . solid, uncompromising rain for a half hour or more. All the gliders were tucked away safely under plastic, but the pilots were not. Drenched in the rain, we stood until the storm blew itself out. Soon there was the fine sight of gum boots being emptied out and socks gently steaming on the heather.

"The competition followed its normal course: static judging, followed by first flights all around, a break for lunch, second flights, trophy handouts, and home to the bathtub. Conditions were bad for only the first flights, with a gusty wind knocking everyone off course. But things improved for the second round, as did just about everybody's score. In the end, Mike Trew took first place with his Kirby Kite. Yours truly was second with the Silene, and I think John Fletcher was third with his Janus (I'm not too sure about this, in that the official results have not filtered through yet).

"Max Fripp flew his SB-10. The full scale version of this plane has a span of 29 meters, so even a 1:6 scale model is large. It handles well despite the tiny tip chord. It has a retractable wheel and the usual spoilers, ailerons, elevator, and rudder.

"Cliff Charlesworth and his ASK-18 showed well in the judging circle. This plane is exceptionally stable, elegant and lifelike in the air. I photographed Larry Baker's DG-100 on final approach with wheels down and brakes out. Although a beauty, that plane lost in the static judging in that it is a virtually ready-to-fly kit.

"John Fletcher's Janus has flaps in addition to the usual controls. He benefits from flaps up (negative) for high-speed running. Most of the apparent dihedral is due to the swept-forward wings. Here's a very smooth flier in the hands of a very capable pilot.

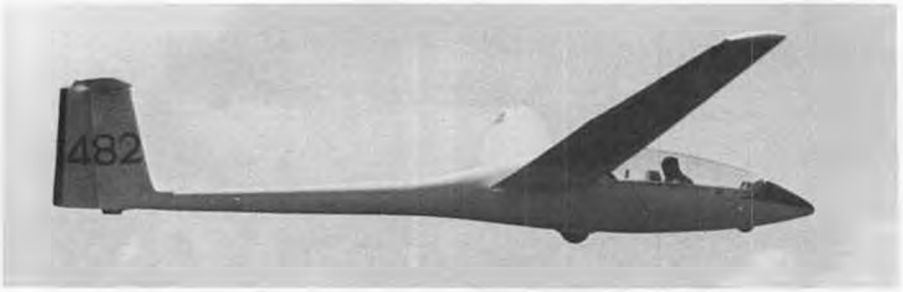
"John Foster's Hjordis is an experimental British design of long ago. As in the full scale, no brakes are fitted in the model, and there's loads of problems trying to land this bird. While diving, Brian Eagle's Horsa, a World War II troop-carrying glider, suffered aileron flutter. In fact, one aileron detached itself. Somehow Brian managed to land his stricken plane without damage.

"All in all, over 30 scale gliders were present. Yes, there was indeed a second rainstorm. We all got soaked twice. But . . . at least we had blue skies and sunshine in between times.

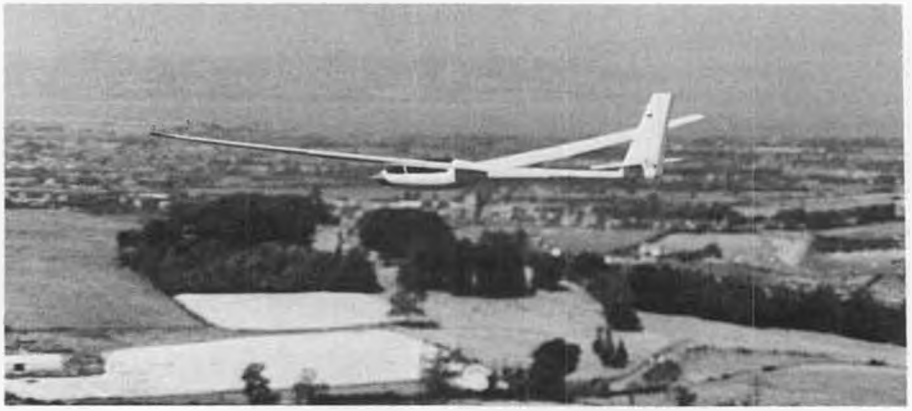
"Larry, my next model will be a 1:4 scale Slingsby T-53. I'll keep you posted as the particularities of this beast develop."

* * *

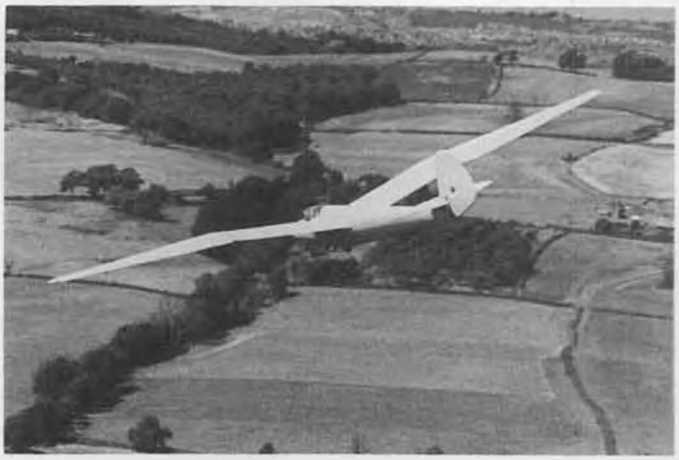
Built-up balsa is a wonderful experience. But perhaps that era is on the way out. Foam wings and fiberglass fuselage are coming in. Some European models are being stamped out of modern plastics with great precision. These fly more efficiently than was considered possible even a year or two ago. For example, the Sitar brothers of Austria now hold the world's speed record with a sailplane that has moved almost 250 miles per hour. Eugene Pagliani, an Italian, creates planes that look like jewels. The tough



John Fletcher's Janus two-place sailplane makes a close pass. Swept-forward wings give the illusion of excess dihedral. Note tandem non-retracting wheels.



Climbing out just after launch is Max Fripp's 1/6-scale SB-10, possibly built from a Carrera kit. Beautiful countryside is typical of English flying sites.



One of the classic sailplanes of all time, the Minimoa, designed by German glider pioneer Wolf Hirth way back in the 1930's. This one was scratch built by Ken Merritt. Really looks great with the sun shining through the wing. . .

surface plastic appears to be molded directly onto the foam core. The airfoil is precisely what the designer calls for. The plane fits together and moves through the air with minimum drag. Perhaps it's time we start exploring the possibilities of new materials and building technique.

Rick Schrameck, of Leucadia, CA, is hot on the trail. He's a biochemist presently working for Dupont, which provides him a unique vantage point with respect to new materials and processes. Before this, he owned and operated a Ferrari dealership. Rick is a multi-engine rated pilot who owns a Cessna 310. He's been into R/C modeling for the past three and a half years, with special attention to pylon racing sailplanes.

Kevlar is a newly registered Dupont product of fantastic strength and low weight. This fabric comes in two densities. Rick suggests that the 1.8 ounce per square yard density is most suitable for building radio control sailplanes. As he puts it, "First you form a fuselage mold from Geluton, a very hard South American carving wood. Construct the plug by gluing together 1 x 4-inch slabs with Titebond. Use a conventional wood plane for coarse shaping, then follow this with successive stages of sanding, using 36, 100, 180, and 320 grit paper. All in all, this takes about four days of full-time devotion. This fuselage mold is then covered with automotive primer. A 3M product called Acryl-Blu Glazing Putty (number 0596) is used to fill the wood grain. You rub it on by hand, then let it sit five minutes in the sun. Acetone or lacquer thinner is used for cleanup. Sanding with 320 grit paper produces the final result, which is now ready for Zynolyte Light Grey Hot Rod primer or equivalent.

"Now construct a 'shadow board' by tracing the plug mold onto pressed wood, then cutting out this outline so that the mold fits into the board at its midpoint. Paint a mold release compound onto the wooden plug and the shadow board, then paint on a thin coat of Gelcoat-epoxy (about 1/16-inch thick). Any color will do. By the way, the epoxy material can be purchased from Aircraft Spruce, Orange County, CA. After about an hour, the surface is tacky. At that time, apply four layers of 6 ounce per square yard fiberglass cloth using one-hour two-part slow-curing epoxy. Saturate each layer with epoxy before adding the next. Let the epoxy set up overnight. The next day, separate the

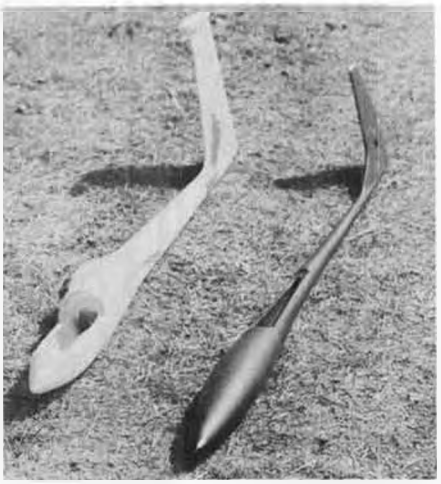
Brian Eagle's WW-II Horsa troop glider experienced aileron flutter on one such high-speed pass, lost one aileron entirely. Got it down OK, though.

John Foster showed up with an unusual bird, an old British design called the "Hjordis." Aerodynamically clean model has no spoilers, is said to be a tough one to land.

Cliff Charlesworth flew this 1/4-scale AS-K18, spans just over 13 feet. Plans are available for this one through RCM&E, an English model mag.

Rick Schrameck holds the fuselage plug and mold for his new F3B design. Looks like a lot of work . . . and it is.

Rick poses with a finished fuselage. Dark areas are carbon fiber reinforcement. Text gives full details.



Rick's primed fuselage (right) with a fuselage from a "Sea Breeze" from Bob Smith.

mold from the plug and the shadow board and repeat the procedure on the opposite side. Now trim the outside edge of each half. All in all, this much of the process takes from 60 to 80 hours.

"Now you're ready to produce any number of fuselages. Wax the mold with any Carnauba wax (such as the one produced by Trewax Co., Culver City, CA 90230); let it dry, wipe and repeat this wax-dry-wipe-polish process three or four times. Now brush on a polyester or epoxy mold release liquid. Let this dry in the sun for 45 minutes or until it's thoroughly dry. Cut two layers of 4 ounce per square yard fiberglass cloth for each half of the fuselage mold, leaving two inches or so excess around the edge for trimming. Next cut a layer of the 1.8 ounce per square yard Kevlar and cut two pieces of Union Carbide Corporation's Graphite Tow, each 12 to 14 inches long. These strips of tape are used to strengthen the tail section.

You're now ready to start laying up the fuselage.

"Mix 2-1/2 to 3 fluid ounces of two-part epoxy, pouring one-third of that amount into half the mold shell. Use a short-bristled brush to saturate the first layer of the 4 ounce per square foot cloth into the mold. Use the remaining resin in your cup to saturate any dry spots. Now add the next layer of fiberglass cloth in the same manner. Clean your hands with acetone, then carefully lay the Graphite Tow into the tail boom section. Place the Kevlar into the fuselage and saturate this layer with epoxy resin. Remove any excess epoxy with paper toweling or toilet paper. Repeat this process for the other half of the mold. Let each half dry for at least three to four hours. Trim the mold halves using a single edge razor blade or X-acto knife . . . and be very careful to trim exactly on the midline of the fuselage. Then let these halves cure for at least 24 hours. After curing, these can be removed by gently prying them loose from the mold.

"Now join the halves together by first admitting that this can't be done. Mount them using masking tape, then take a 3/4-inch wide, 6 ounce per square yard fiberglass cloth tape saturated with two-part epoxy, and roll this tape up before inserting it in the fuselage from any opening. Start at the nose or tail and unroll the tape using a stick to probe from the opening. The opening might be for a wing, a canopy, or for a tail cone. Let it cure for 24 hours and, voila, you now have a fuselage.

"The wings, rudder, and stabilizer are produced in the same way, using two pounds per square foot Dow Company Blue Foam Core. Bob Smith, of Bob Smith Aircraft Products, holds a patented process for producing flying surfaces in a neat way. The molds are made in a similar manner, but the halves are annealed under high pressure and temperature. Paint and finish the parts with K&B epoxy paint or equivalent." Rick and Bob Smith are now using this construction process to develop a sailplane specialized for F3B competition. It's a challenge to the Austrian Dassel. The wingspan is 100 inches in order to allow it to enter standard class. The area will be about 1100 square inches, and that's large compared with conventional birds of the same wingspan. The airfoil will be an Eppler 193, and there'll be no fillets between the wing and fuselage (recent studies indicate that the fillets produce more drag and less lift than no

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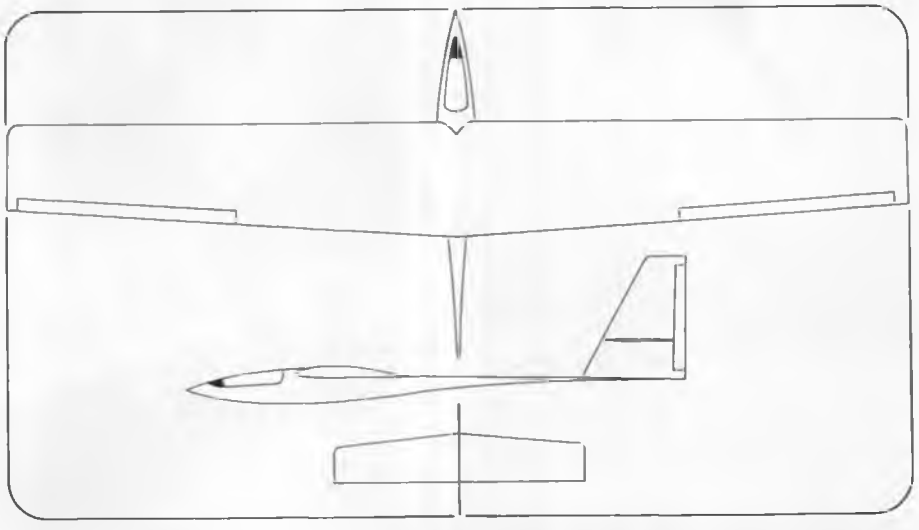
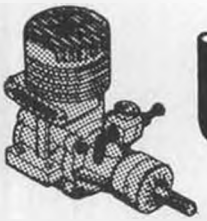


A two-view of Rick Schrameck's proposed F3B sailplane. A little skinny in the tail, maybe, but it does look fast, which is the name of the game in FAI soaring.

FUEL LINES



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Send in your questions, relative to glow or ignition engines, and these experts will give you the correct answers.

KLAUSE

• Some years ago I read an article, the thesis of which was that for an investment of about $100.00 per year, a person could markedly improve his or her personality, and enjoy more happiness. In other words, be less of a grouch, and cut down the odds of getting an ulcer. All that one had to do was spend about that amount at the beginning of each year to buy a good supply of such things as shoelaces, soap, shaving cream, deodorant, tooth paste, make-up cream, etc., etc. Thus, early on any given morning, if perhaps you snapped a shoelace, you'd have a replacement readily available. You'd simply smile and quickly replace the broken one, instead of starting out the day in a lousy mood because of a pieced-together shoelace or some similar irritating incident. The concept has some merit.

What has this to do with your model hobby? Well, perhaps there is a distinct similarity with the following happening. Last weekend, at the local flying site, I watched a fellow modeler go through a couple of hours of absolute frustration. To begin, when he attempted to start his engine, he about wore out an arm flipping the prop. All to no avail. After many nice words about the engine manufacturer, he finally checked the glow plug. It wouldn't light . . . and he had no replacement. A few more expletives . . . His buddy suggested the possibility that the plug was really OK, but that the battery was dead. Sure enough, that was it. So, after borrowing a battery, he started the engine, and taxied out for takeoff.

As luck would have it, he hit a rut, nosed over and broke a prop. You guessed it. He had no spare. However, he was determined not to be denied, and bought a prop from another flier. After waiting his turn again for use of his frequency, he borrowed another battery, but again couldn't get it started. Seems that he had zapped the glow plug with the borrowed battery . . . a 2.0 volt one on his 1.5 volt plug.

By this time, several of us were quite empathetic with his plight, so we pitched in and got him squared away for another start when his frequency turn came up again. Finally, it seemed that he was on his way, and he taxied out, carefully avoiding any ruts. He began a gradual turn into the wind for takeoff, and then started some frantic body gyrations. Personally, I couldn't understand why he'd picked such a time to brush up on his disco, but then he screamed, "I AIN'T GOT IT!" As his plane continued off into the boondocks, more than one onlooker cracked up with laughter. Now, as many of us know, "It's no laughing matter." No matter how comical it may be.

Well, after restoring some composure, we retrieved him and his model. What had gone wrong this time? Apparently, he had neglected to adequately charge his transmitter Ni-Cds. At this point, all he could do was kind of slump down and mumble. Someone else cautioned about possible stray dogs, raised hind legs and field boxes, but with no apparent appreciation for such humor, he just packed up and left. Can you just imagine the next possible scene? He walks into his home, and his wife says, "Hi honey, did you have some good flights?" You take it from there. . .

I'm sure that some of you would label that guy as a real klutz. Maybe so, but I suspect that similar scenes happen all too often. What the answer? I have two suggestions. First, write down what you think would be nice to have in your field box. Don't hesitate to ask others for some suggestions. Then, each time you visit your local hobby shop, buy just one or two extra of a particular goodie. That way, you won't bankrupt the budget all at once, and you'll soon have an enviable field box.

My second suggestion is similar to the first, but it's really a steal from full-size aviation. Use flight check-off lists! Don't tell me you don't need them. That's what some pioneer aviators proudly proclaimed. Then an engineer invented the retractible landing gear, and pilots perfected the wheels-up landing maneuver. Not long after, the check-off list was born.

Today, professional pilots swear by check-off lists. If you use them conscientiously, you'll probably do a lot less swearing. Once again, develop your own. How about a night-before check list? Charge Ni-Cds, check fuel, starting batteries, etc., etc. I suggest two more: at-the-field pre-flight and post-flight check lists. Use your common sense and imagination. When you're satisfied that your check-off lists are complete, then adhere to them religiously. You'll have a lot more fun and less frustration. You might even hug your wife when you get home! Fly safely. . . •

NELSON

• Last month I started with a general description of the model diesel engine. This month I'll go into some more detail. I also very briefly mentioned the development of the diesel . . . mostly in Europe . . . and I'd like to start this month on that subject.

It's fair to state that the long term trend of model engine development has been to build engines having higher power-to-displacement ratios and higher power-to-weight ratios. The first is due totally to the segregation of compeition classes by engine displacement. The second has been less important, although it can be critical in certain classes of competition. Examples are the elimination of the spark ignition engine by the glow (and diesel) and the near elimination of the baffle piston engine by the Schnuerle ported engine.

For all of its benefits of simplicity and cheap fuel, the diesel proved itself unable to beat the glows whenever horsepower per cubic inch was important. The reason is really pretty simple, and is as follows.

An internal combustion engine is a fixed displacement air pump. Without supercharging (which includes the tuned pipe), there is a maximum amount of air which can be drawn into an engine's cylinder. The practical maximum will naturally be less. Into that air can be introduced however much fuel is required for maximum power. That's what we do when we adjust the needle valve.

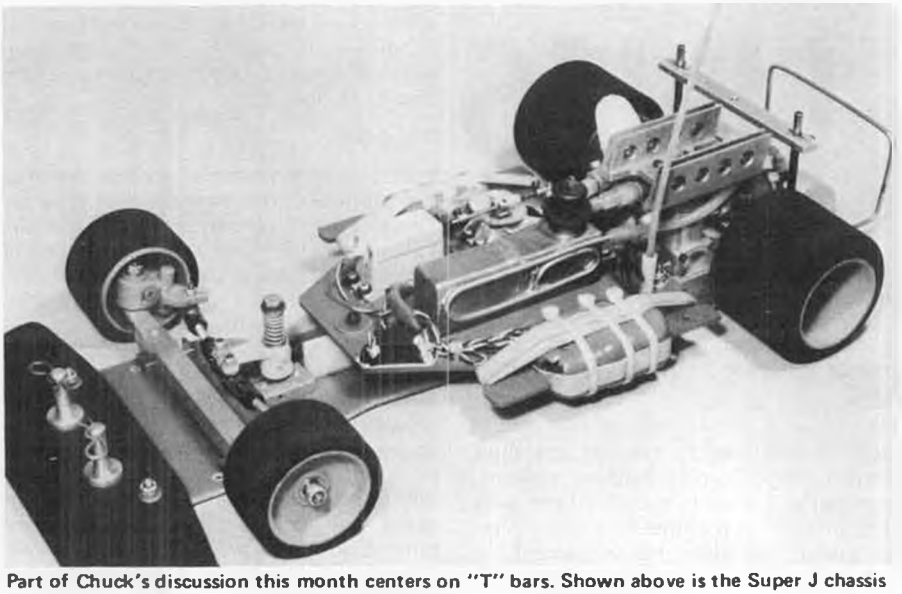
When we compare fuels we have to look at the energy output per quantity of air, not energy per quantity of fuel. Because it supplies some of its own oxygen, nitromethane is *the* fuel to use if we want to generate hp/in³. Methanol has less power, and down at the bottom are the paraffin hydrocarbons. What's the base of diesel fuel? Right, kerosene, a hydrocarbon distillate with lots of paraffins.

Conversely, if we want good fuel economy we should pick a diesel because its fuel has a lot of energy per volume of *fuel*. For this reason, in FAI Team Racing, where fuel capacity is limited to 7cc, the diesel reigns supreme.

It would be reasonable to mix in a little nitro with the diesel fuel to boost the power. Reasonable, but not effective. It seems possible to increase fuel consumption, but power doesn't go up by a worthwhile amount. Probably, it's the vagaries of the diesel's combustion process that prevents proper combustion of the nitro.

The result is that in spite of a lot of FAI T/R competitors trying a lot of fuel ingredients, the kerosene based fuel that I listed last month remains "standard." The recent development has been to reduce the oil content down to

Continued on page 102



Part of Chuck's discussion this month centers on "T" bars. Shown above is the Super J chassis with a brace that serves the same purpose as a "T" bar.

R/C AUTO NEWS

By CHUCK HALLUM

PHOTOS BY AUTHOR

• Monaco will again host the World Cup formula car race for 1/8 scale R/C cars in 1980. Race date is approximately the last week in May or the first week in June. However, official entries must be in two months in advance. I will probably be a member of the committee to select ROAR team racers to attend the World Cup. ROAR (U.S.) is being allotted about 15 racers. With this allotment, all racers able to go may make the team. However, if more than 15 racers desire to go, I would like to see the U.S. represented by the best open wheel Formula car racers. I am soliciting your help to select the U.S. (ROAR) team. If you are interested, please submit your name, address, phone number, and finishing awards in World, U.S. Nats, Indy, Winter Nats, or large regional races (particularly open wheel and Formula events). Send to Chuck Hallum, 18276 Foxglove Way, Irvine, CA 92715 by the deadline (March 22, 1980).

This month we will discuss some miscellaneous technical topics. However, there is one subject I will shy away from: differentials. The reason for this is that I will be doing a full article just on differentials in a couple of months. It will cover everything I can think of, from design concepts to driving characteristics.

So what are we going to cover this month? Well, I really don't know . . . we'll just get class started and cover any questions you have. Ah . . . somebody in the front row asks, "What is a 'T' bar and what does it do?" I talked about "T" bars a couple of months back. I must admit, the picture in the article didn't really show the bar too well. Figure 1 shows a chassis and "T" bar. As you can see, the bar is quite stiff in the vertical direction because of the thickness and can also add some roll (twisting) stiffness. The bolt that comes through the chassis can be moved to select the desired stiffness for the track conditions. The forward bolt location will increase the vertical stiffness the most. If the bolt is tightened, the chassis/bar roll (twisting) stiffness is also the greatest, but if left loose the roll stiffness will go up slightly. The plastic "T" bar material is only threaded partially; the bolt will be tight and the plastic material will act as a locknut.

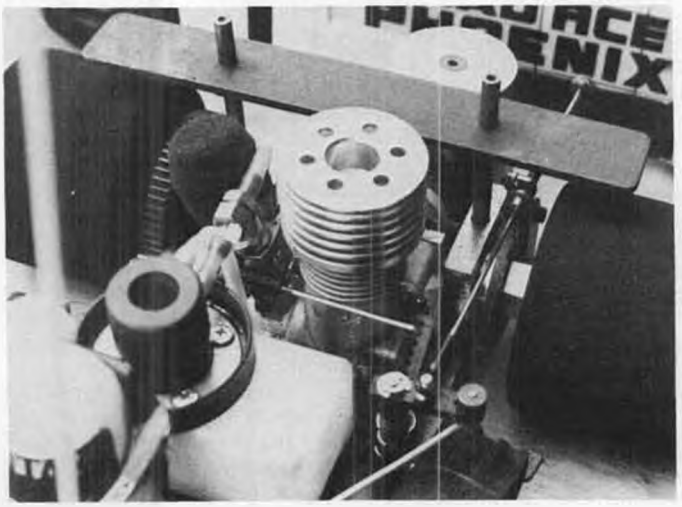
In playing around with a thin piece of fiberglass, I found an interesting occurrence. The piece of fiberglass was about .030 in. thick by almost 3 in. by 6 in. When a slight twisting torque, similar to a roll twist, was put on the small fiberglass sample the vertical stiffness decreased. In fact, when the center was pushed up and down (while twisting), there was no resistance over a small deflection, or even some negative spring rate. I have seen this happen on larger sheets of chassis material.

Figure 2 shows the type of loading that is equivalent to the chassis twist that we're talking about. What appears to happen is that there are two semi-stable modes of chassis bending that can occur. Let us assume the forces are such that points A, B, and C remain on a flat plane and D rises, as if going over a bump. One of the semi-stable bending modes (case 1) is that line BC remains straight and the chassis curves along AD so that D rises; in this case, point X, the center of the chassis, does not move.

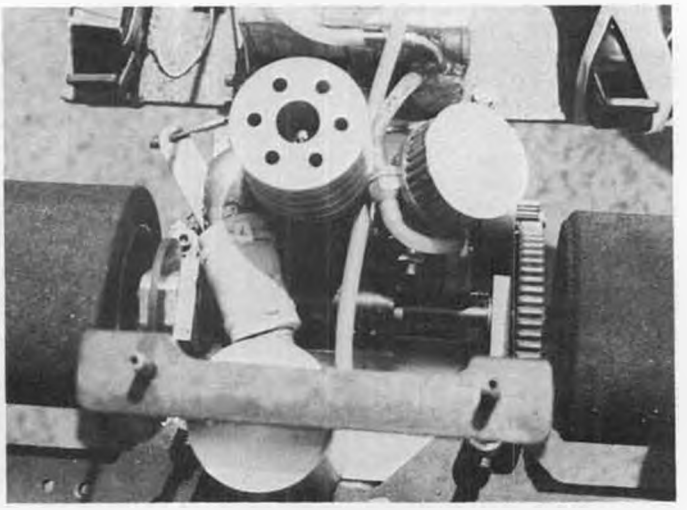
Case 2, the other semi-stable mode, is if line AD remains straight and the chassis bend in downward along BC. In this case, if A, B, and C are on a flat plane and D is higher, it is obvious that point X rises. The upward movement of X is half the movement of D. Point X seems to have very little resistance to motion between the semi-stable locations for case 1 and case 2.

So, if your radio tray is mounted at three points and the forward center mount point is near the equivalent point X of the chassis, unrestrained vertical oscillation can occur. Hence, the chassis had better be dampened or stiffened or we're in trouble.

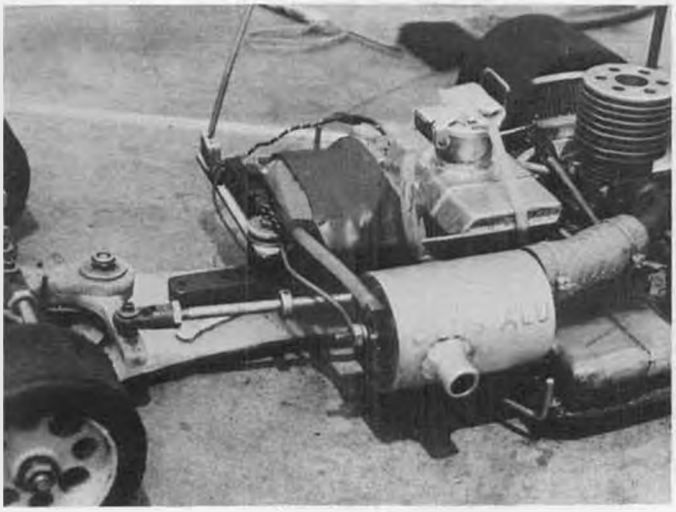
Possibly, this effect is what we are



Fuel tanks and sumps are also covered this month. N. Ishihara's Phoenix car has fuel pickup and vent lines on carb centerline.



Chuck Hallum's HRE car has fuel sump directly in front of carb. Vent and pickup are both in sump.



View of the "T" bar installation on Rich Lee's Associated car. In this case the bar is made from Delrin.

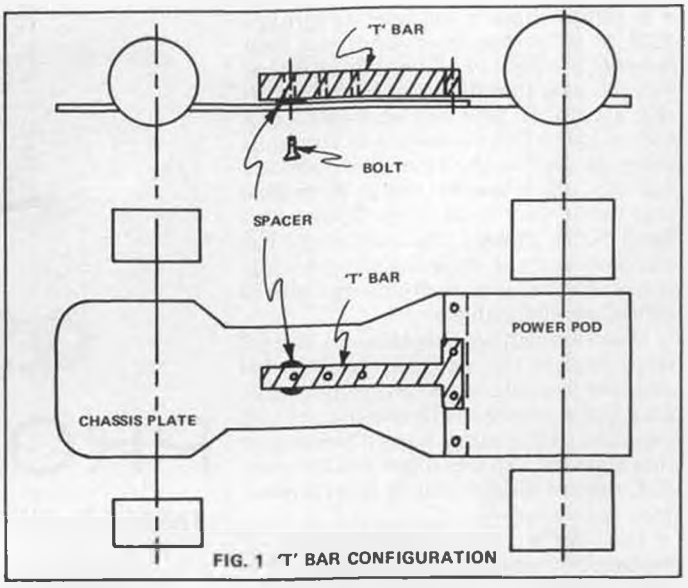


FIG. 1 'T' BAR CONFIGURATION

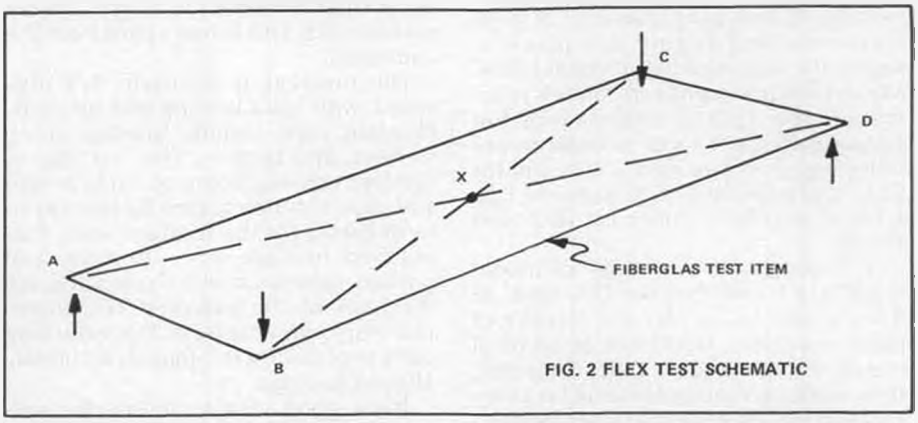


FIG. 2 FLEX TEST SCHEMATIC

seeing in our R/C car chassis, hence vertical stiffening is required. All I can say is that laminating a strip(s) of Kydek on the chassis (either aluminum or fiberglass) improves car handling. The Kydex doesn't really add that much stiffness, but adds damping to stop chassis oscillation. Metal stiffeners cut down the oscillation amplitude. The "T" bar is a combination of the two. One problem with the "T" bar is that the radio components and fuel tank locations are more restricted. Mounting and linkage problems can also arise, so a little more thinking and time are required when building the car.

As I mentioned in the original article, some Delta cars have a brace down the middle similar to the "T" bar. HRE cars bolt the radio tray to the chassis on some washers to stiffen the chassis a little and damp vibration.

OK, a question from the right. "Are fuel tank and sump design critical?" They sure are! In fact, tank design becomes a more critical factor the faster a car goes. A year ago I got caught with an improper fuel tank at the 1978 Nats. The primary reasons for the problem are large carburetors, greater acceleration, and higher cornering speeds. The large carbs have low fuel draw pressure (very little carb venturi suction) and the greater acceleration, braking and cornering cause fuel head pressure variations. When cornering at high g's the fuel head variation from right to left turn may be over an inch or two. All of this means that the location and function of the sump and fuel tank are more important than ever.

The fuel tank and/or sump should be laterally located reasonably close to the carburetor centerline, particularly on road cars. The fuel tank being forward of the carb is OK, because under load the engine has a tendency to lean out. On oval cars, which always turn one way, it is also OK to put the tank toward the inside because the engine will be under more load during cornering and can stand to have more fuel head pressure.

On road cars I recommend that the lateral location of the fore and aft fuel tank centerline not be more than about 1/2 inch offset from the carburetor centerline. On oval cars the fuel tank centerline offset should not be more than about 1 to 1-1/2 inches. If you are running a chicken hopper type tank, the above comments apply for the location of the fuel level control vent.

"What do you think about using fiberglass for the radio tray?" someone asks from the back. Personally, I don't think it's a good idea. We have been having excellent reliability with our current radios, partially because of the plastic radio trays. The plastic is able to absorb a lot of the high frequency vibrational energy, rather than transmit it to the radio component mounts. The racers using a fiberglass radio tray seem to again be having radio problems, mostly with the wiring and connectors.

The reason that racers are changing the radio tray material is that with all the cutouts that are being made, the tray becomes flexible and weak. Probably the best thing to do is use a larger piece of plastic to start with so the cutouts will not weaken the tray so much. Or start with slightly thicker material, or add stiffeners where required. But stick with plastic.

"Last month at a big race I got screwed out of a lap and my protest was refused. Is there any way we can get a better lap counting system?" I just covered the way lap counting was done at the Second World Championships and in the past described the U.S. Nats and First World Championship lap counting systems. Both systems have their problems. The U.S. system requires one person per car for counting and recording (plus an overseer), but protests can be accurately resolved. The EFRA system only requires three people, but protests are more difficult to resolve. But there should be some new systems coming down the pike soon that should be much better than either of the above.

It appears that a simple and relatively economical microprocessor and printer can do the job. The addition of a CRT (cathode ray tube) or several LCD's (liquid crystal displays) for the announcer would make it a super system. Elapsed and lap times for each car would be printed out after each race, and the CRT or LCD's could display car positions during the race. Some home computers that are relatively portable might be able to do the job. Many people across the country have home computers . . . or maybe they could be rented. All we have to do is write a program.

Several people ask, "What are the ROAR rules proposals for 1980, and what do you think about them?" Well, first of all, I hadn't heard much talk about the rules proposals from anybody or seen anything written up in magazines or even *Rev-Up* for that matter. But I finally

Continued on page 86

PHOTOS BY AUTHOR

PRODUCT$ IN U$E

The M.E.N. PIPER J-3 CUB . . . By JIM KITCHEN

• Breathes there a modeler of vintage 1937 or so whose heart does not beat faster at the sight of a Piper J-3 Cub? That was the year that the first J-3's rolled off the assembly line at the Piper Lock Haven plant. This modeler was born four years earlier, so the skies were already full of Cubs when he began to realize that more than birds were flying overhead. Some 20,000 Cubs later, the J-3 has become one of America's most illustrious aircraft, and an all-time favorite of modelers everywhere.

How else can you explain why the J-3 is probably the most kitted model airplane in existence. I can count twelve Cub kits available in either balsa or foam versions. These range from a Sterling kit that goes back to free flight and the early R/C days of rudder only to several nine-foot span models.

The M.E.N. (Model Engineering of Norwalk) kit is another fine model in the Cub tradition of simplicity and ruggedness. Its 72-inch wing span and .29 to .35 recommended engine size places it nearer the large end of Cub model sizes. My overall preference in models is for those in the .15 to .25 engine range, but occasionally I get a yen to build something bigger. If you have a soft spot for Cubs and a similar yen, then the M.E.N. J-3 is an excellent choice for your next model.

In looking over my roster of model engines, I found that the O.S. Max .35 R/C, a reliable standby and favorite of many modelers, stood out as an ideal match for the M.E.N. Club. Together, they make a great combination for a very realistic fun-type sport/trainer model.

Two outstanding features of this kit are its thorough instruction manual and self-jigged fuselage construction. Other features are a complete parts and cutting list, built-up tail surfaces, special undercambered high-lift airfoil, optional wing dihedral construction, and die-cut windshield.

The 32-page instruction manual contains the most comprehensive instructions of any model airplane kit that I have ever seen. For example, wing construction is covered in 60 itemized steps and the fuselage (including landing gear assembly) requires 67 steps. Finishing instructions include a helpful hint for covering the undercambered wing. Final assembly instructions describe checking for wing warps, incidence settings, wing, stabilizer, and vertical stab alignments. If you are a novice to R/C flying, the flying instructions emphasize the importance of obtaining experienced help, but they also describe a self-teaching approach to flying your Cub.

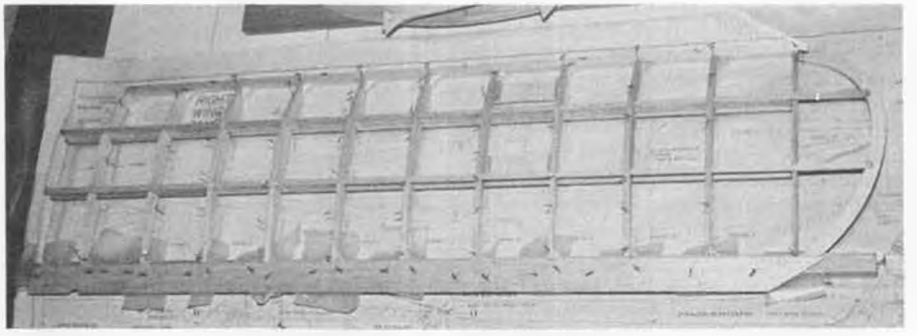
The last six pages of instructions are the parts and cutting list. All pre-shaped parts are grouped by component and listed as to quantity, description, and material (i.e. balsa, plywood, spruce, plastic, etc.). The cutting list is an extension of the parts list, indicating the lengths of parts to be cut from the stick material provided. Anything described in the parts list will be found either pre-cut to length or in the die-cut parts. A good ruler is helpful to check pre-cut parts for size, and to make parts from the cutting list.

The fuselage is primarily 1/8 plywood, with balsa bracing and stringers. Plywood parts include fuselage sides, formers, and bottom. The first step in fuselage construction is to cut to length and glue 1/4-inch square balsa sticks to form braces for the fuselage sides. Prenotched fuselage sides, formers, and bottom, combined with this bracing, are the basis of the patented Tri-Square-Lok design which utilizes 20 interlocking parts to provide a self-jigged, accurately aligned fuselage.

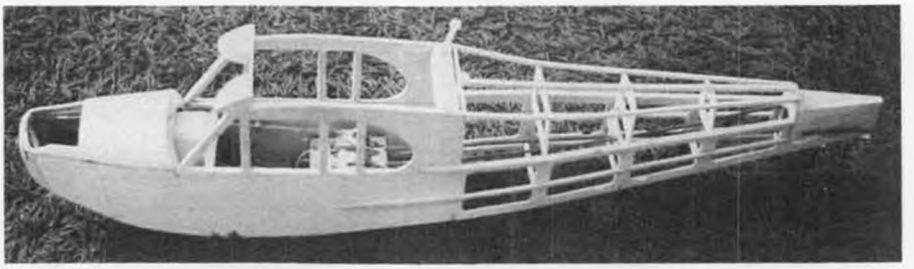
It's a good idea to follow the self-jigging instructions using No. 64 rubber bands and modeling clamps to test fit the joints before applying glue. Kraft 1-1/4 and 4-inch modeling clamps are particularly useful, or you can make clamps using popsicle sticks and rubber bands. I like to use Hobbypoxy Formula 1 (working time 15 minutes) for fuselage construction. Even with 15 minutes working time, you have to be a fast worker to epoxy all the joints in the self-jigged fuselage. A dry run is a big help in becoming familiar with the self-jigging parts and procedures.

One problem over which the manufacturer has little control is the bendability of the poplar plywood used for the fuselage sides and bottom. It may be necessary to partially saw through the fuselage sides between formers 2 and 3 to help the sides to develop curvature to the nose block. This is covered in the instructions. I tested my sides, and decided that I did not have to do this. However, I did experience some difficulty in bringing the fuselage sides, bottom and former No. 1 all together at the nose.

The tail components are of built-up construction, consisting of 1/16 die-cut balsa sheeting over a framework of 1/8 Lite Ply, spruce, and balsa ribs. This construction takes longer than solid balsa, but it results in a lighter and

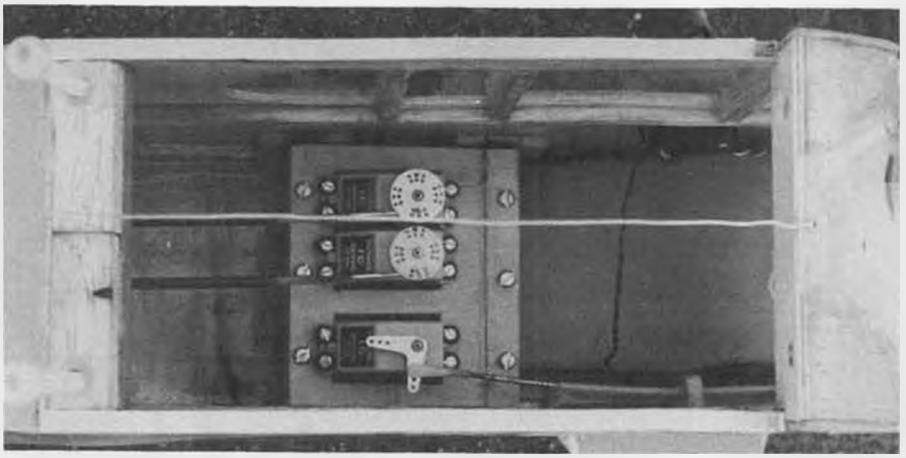


Wing construction is quite strong, features four spars plus shear webbing. Note the 3/4-inch shim under the t.e.; except for the l.e., the wing is built up in the air.



Basic fuselage structure is 1/8 Lite Ply. Tri-Square-Lok design utilizes 20 interlocking plywood parts to provide a self-jigged, accurately aligned fuselage.

Engine compartment was extended 1/2 inch to fit Kraft mount and O.S. .35.



The M.E.N. Cub has plenty of room for the radio gear. The author prefers three abreast servo mounting, made a servo tray from 1/8 ply. Rx and battery pack up forward.

stronger set of tail surfaces. I started the kit by building the vertical stab and rudder. These relatively simple parts should give you a feel for the kit design. Sort of sets the rhythm pattern (or personality) of the whole kit.

My most disliked modeling chore is installing hinges. I get around this by using Monokote hinges. The Cub hinge installation is made easier by the use of two 1/16 x 1/4 spruce lengths laminated together to form the stabilizer/elevator and vertical stab/rudder mating edges. These lengths are pre-notched to receive the flexible nylon hinges provided. As for me, I stayed with my Monokote hinges.

The wing is of a special design consisting of a high-lift undercambered airfoil to give realistic slow flight similar to the real Cubs. Flight speeds from 8 to 40 miles per hour result from this design. For wing construction, a 3/4-inch shim is needed under the trailing edge to properly position the trailing edge and ribs in relation to the leading edge. As the actual thickness of ordinary hardware store one-inch lumber is 3/4 inch, a straight three-foot piece of one-inch lumber or 3/4-inch plywood can be used for this shim. The only error I found in the instructions is that the wing strut platforms are incorrectly identified in Figure 4, page 27 as part B . . . two Lite Ply shear webs.

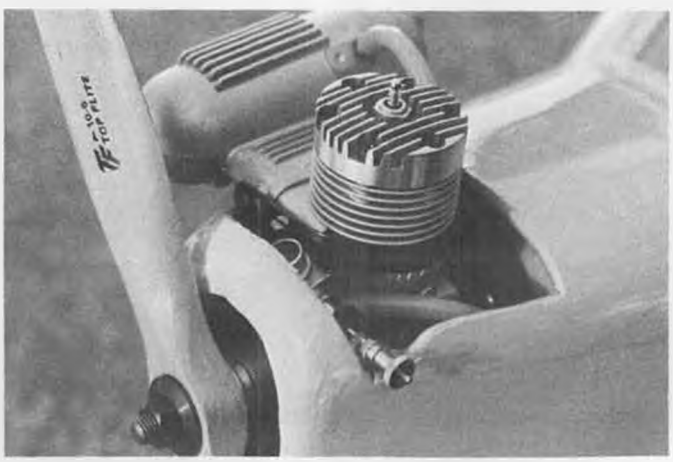
Rounded wing tips are another bothersome chore. In this case, the wing tips are die-cut from Lite Ply. They are designed to be slightly larger than their horizontal projections so that when positioned between leading and trailing edges, they bow up into the same shape as the top part of the wing airfoil.

You have the option of building the wing with either a two or six degree dihedral angle, depending on whether your model is intended for sport or trainer duty. The parts for both dihedral angles are included, and are clearly stamped with either a "2" or "6." The instructions say that with two degrees of dihedral, the plane must be flown as if it were an aileron trainer. I chose the two degree dihedral because I enjoy spins, and it is more scale-looking than the six degrees.

The windshield and cabin windows are die-cut from clear plastic. See-through windows certainly enhance the model and add to its realism. It is a good idea to make a pattern of the windshield or save the die-cut scrap for a pattern. This may come in handy if you goof up the windshield or have to do some reconstruction work later. The instructions suggest cyanoacrylates or Wilhold R/C 56 for gluing the windshield. However, I like to use Hobbypoxy Formula 2 for fuel proofing, and I wasn't sure that this would be compatible with these glues, so I decided to use Hobbypoxy Formula 1 to attach the windshield and windows. If you use epoxy, you should roughen up the plastic edges with

Continued on page 100

If it wasn't for the engine cylinder and muffler, this could pass for a real Cub at a local airport. Finish is yellow Monokote.



O.S. .35 installation. This is at the top of the model's engine size range; you certainly won't need more power than this.

The M.E.N. Cub's highly undercambered wing and light weight make for an easy, slow-flying model. Photo by Bill Knorr.

Dave Sweeney, of Dallas, Texas, shows how to crank up an Ohlsson .60 Custom with one flip. Really nice Miss America is a free flight. Photo by Larry Kruse.

PLUG SPARKS

By JOHN POND

• South Africa! Welcome to the fun! According to the latest dope from Jack Abbot, of Vereeniging, South Africa, Old Timers have finally taken hold with a vengeance.

This columnist has been the recipient of the latest newsletter from the Vaal Radio Flyers. Their newsletters are hilarious, being liberally sprinkled with Sherry cartoons from the *Aeromodeller* column run by "Pylonius." I can think of no better way to introduce the South African activity than to quote directly from their first announcement of an Old Timer contest in January 1979. How about this?

"YE CLARION CALL TO YE ANCIENTS. Other countries have been pursuing the nostalgia trail for some time now and an increasing number of vintage and/or antique models are beginning to appear in South African skies. I (Abbot) have an *Aeromodeller* plan 'Leprechaun' that steals the show wherever it goes. I also have a Scientific Mercury, Flying Cloud, and a silked Comet Sailplane. Brother Bob has a Korda and Comet Gull (rubber jobs). Harry Allan throws a Comet Clipper around the sky while Ian Fraser gets a lot of pleasure from a Buccaneer Special. Sid Myers in Salisbury is trying to cram a radio in a Skyrocket A (columnist's note: lotsa luck!), and according to latest reports, another Mercury exists in the Pretoria area. I have just seen Allan Hamilton with a Keilkraft Gypsy and Reg Brown with a Black Magic.

"There are many others who, troglodyte-like, painstakingly assemble fuselages from 1/4 square instead of hacking into a chunk of foam with a hot nichrome wire. Being modelers, most of these ancients would like an opportunity to poke fingers through someone else's tissue covered wings while telling yarns about the number of flyaways that have contributed to that huge forest of balsa that exists up there someplace."

With this introduction, Jack invites all modelers to come to the Vaal Radio Flyers Field to discuss some thoughts on forming an association to act as a clearing house for exchange of plans, motors, etc. Jack even suggests arranging a get-together for the purpose of telling even more and better lies about long-past performances.

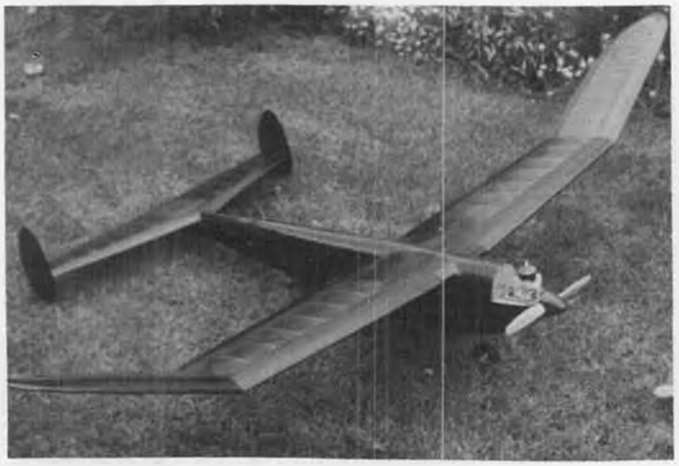
Abbot was sharp enough to appreciate the fact they would never be able to get enough members to rival SAM, and feels the African boys should do as the English boys have done; organize a SAM Chapter, for starters. Rules should allow vintage models up to 1950, as many of the better English designs didn't appear until well after WW-II. This would allow many *Aeromodeller* plan designs to compete.

Anyway, to make a long story longer, Jack Abbot reported in the SAARF (South African Aeronautical Radio Flyers) newsletter that they actually had five people show up with models at the First Old Timer Bash. Actually, more would have shown, but three "for sures" failed to make an appearance.

Jack sez you couldn't have asked for a better start: the weather was just outstanding, and all who came got what they came for . . . FUN! Some fellows who showed without models had nothing on Harry Allan, who brought the parts of his Buzzard Bombshell (after the dog got through with it!) just to prove he was truly interested.

Some authenticity was provided by Bob Abbot's rubber jobs, the Korda and Comet Gull. This provided a lesson for the foam and plastic boys in the degree of patience required for trimming. While on the authenticity kick, Jack Abbot had an R/C Comet Sailplane complete to the last riblet, but alas, the Super Cyclone was not ready. In its stead a hot Webra .40 had been temporarily fitted.

Here in the States the performance would have been termed satisfactory, but to these neophytes, the climb on the Sailplane could only wring out comments like *"Holy Cow!"* (edited) from the onlookers. In trying to achieve true authenticity in flight path, an upward spiral was programmed, but the model got lost in the sun. The next thing anyone knew, the model had reversed



A 1946 design called the Dolphin, published in *Aeromodeller*. This one built by Dennis Parker, of Australia.

Don't feel bad if you can't identify this one; it's really a Miss Tiny, but with an extra wing! Gordon Codding built it, has converted other O.T.'s to bipes too. See text.

Two O.T. greats taking it easy at the Huriot R/C O.T. Bash: Playboy designer Joe Elgin (left) and Chet Lanzo.

Good Lord! Wilt Schachtel went whole hog on this 12-foot Playboy. No, the dog doesn't fly in it . . . although he probably could.

direction and was coming down in a death spiral. Jack commented that no beefing-up could stand that treatment! Repairs were immediately in order (after the crash, natch!).

In stark contrast, Ian Fraser's Buccaneer B Special buzzed around interminably with reduced throttle. This was added to by numerous hand launched gliders and a few CO_2 models. With magazines to pore over, an Ohlsson .23 on the stand that defied all attempts to make it run for more than 30 seconds, plus all the bull sessions going on, there was no real reason to handicap the fun by calling themselves a committee, acquiring a title, and setting up a schedule.

As it turned out, it was decided to hold another meet in less than two months. The parent club, the Vaal Radio Flyers, have agreed the "ancients" are harmless and have given them carte blanche. Actually, it was almost a foregone conclusion with Reg Brown, the Chairman, having nearly completed a Black Magic and wanting to get in on the fun!

History was made. The Old Timers were established as part of the club program. Two more Old Timer Bashes have been held with the second one producing an Old Timer control line enthusiast. Abbot reports a certain prominent R/C chairman was to be seen enjoying Old Timer ukie flying. It's infectious!

Abbot's humor in the newsletter is an absolute panic. This writer could go on and on. Reg Brown had a Black Magic tastefully finished in transparent Solarfilm. Abbot sez this model will be known as the "Streaker." However, the FUN that Reg Brown (who never knew Old Timers) gets from his vintage model is an object lesson to those who think that "flat out" is the only scene.

The Old Timer movement really started to take hold at the Third O.T. Bash. Two newcomers, Brian Partridge and Andy Cirro, brought out Buzzard Bombshells that drew such raves that most of the other interested would-be Old Timer Fliers were all set to build nothing but Bombshells. Abbot sez he hopes this doesn't generate to the point similar to that where nothing but "Ugly Stiks" are seen on the R/C field.

Abbot also noted that Allan Hamilton flew his new Buzzard Bombshell and had the free flight purists muttering dark threats as he had the Buzzard performing loops, rolls, stall turns, low passes and anything else but the stately manner in which those beautiful Old Timers flew. Abbot will have to introduce Allan to the "relaxing-in-the-deck-chair-with-transmitter-on-the-ground" method of flying. Radio interrupted free flight is the name of the game!!

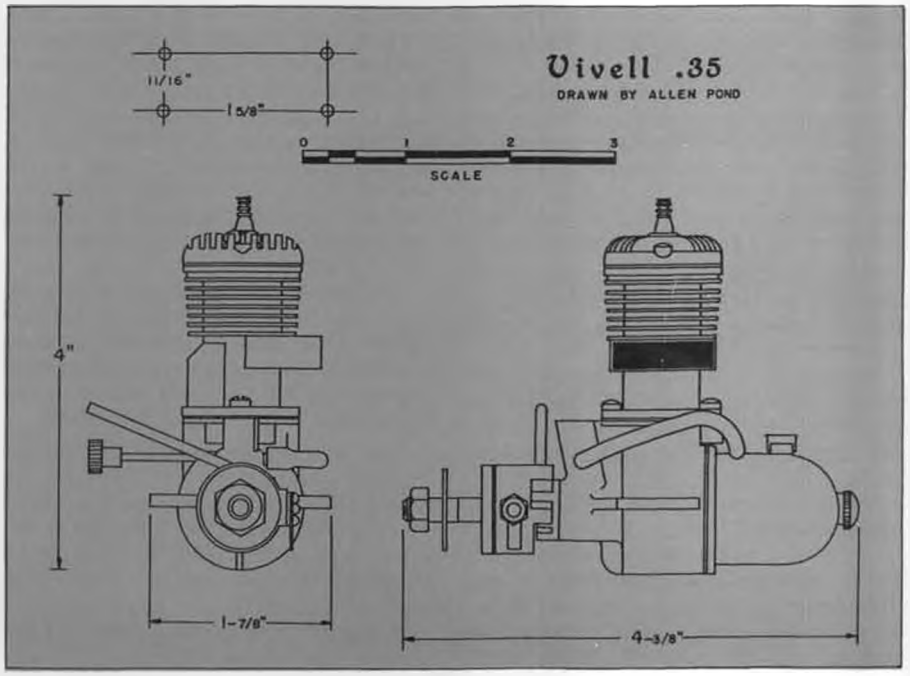
Abbot reports some fellows are just like modelers were in the old days, finishing their models on the field (how long has it been since you have seen a guy on an R/C field finishing a model?). This is half the fun when they are able to see their creation fly later in the day. Jack and the boys have truly found out what this Old Timer game is all about: FUN!

MOTOR OF THE MONTH

Back in the August 1977 issue of **Model Builder**, we ran the Comet .35 as the featured engine of the month. If this and the Vivell .35 seem similar, there is an excellent reason: they were both designed by the same guy, Jack Keener!

As explained in that issue, Jack simply

Howard Osegueda, of Root's Hobby Shop, flies this Cal Aero Air Trails Sportster at O.T. meets. Photo taken at Morgan Hill.



Ben Buckle was a member of the English contingent at the '78 SAM Champs, placed 5th in B Pylon with Gas Champ.

Ron Keil has one sexy-looking New Ruler, wouldn't you say? A good low and slow flier, it uses 3-channel R/C.

Joe Beshar flies the Bombshell built by the late Ed Franklin . . . hope Ed is looking down.

didn't have the money to continue production of the Comet .35 engine. With World War Two going full blast in Europe and the United States on the brink of declaring war, Jack was approached by Earl Vivell, a local hobby dealer. Earl's idea, of course, was to distribute the motor being manufactured by Keener.

The first motor that came out bore a remarkable resemblance to the Comet .35, even to the cadmium plated cylinder. This is generally considered to be the first model of the Vivell .35. This engine was sold all through the war under the guise of "a few engines available." Having purchased all engine parts and arranged for Jack Keener to stay on, production of engines was assured, based on a nice backlog of parts.

Naturally, the engine underwent several improvements, with the second model having an improved timer assembly and housing. The motor now featured a dull black oxide finish on the cylinder. Cylinder head thickness was also reduced.

According to Don Belote, who wrote a short history of the Vivell engines in a 1964 issue of the *Model Engine Collectors Journal*, there were actually five distinct models, each with varying improvements. Some of the changes included enlarging the bypass and squaring the exhaust ports. In the fourth model, a streamlined metal tank was added to the backplate.

The fifth model (the one we are illustrating) had a higher compression head, angled intake venturi, and the same enlarged bypass and exhaust. (It appears the fourth model was a combination of crankcases from No. 3 that evidently were left over from that model.)

Vivell engines, particularly the large port versions, were good runners. The early models had a tendency to vibrate and were sensitive to needle valve adjustment. The points tended to float at high speeds with a resultant miss. However, this was not noticeable at normal speeds used in free flight models, giving the extremely steady power so desirable in the climb.

Strobatic tests conducted by the *Air Trails* magazine staff in February 1946 stated the Vivell engine turned 8,150 rpm with a ten-inch low-pitch propeller and 7,000 rpm with a ten-inch high-pitch prop. Use of larger props such as a twelve-inch low-pitch gave 7,000 rpm, while the corresponding twelve-inch high-pitch propeller gave 5,650 rpm. Peak speeds were obtained using a ten-inch prop on control line type models.

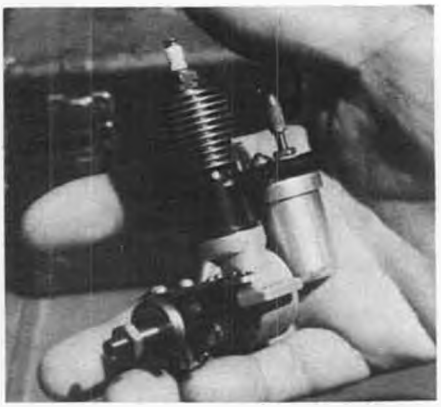
The Vivell .35 motor featured a bore of .768 and a stroke of .750 in., giving a displacement of .35 cu.in. Motor weight was seven ounces without coil and condenser. For the technically minded, the cylinder was machined steel with a brazed bypass and exhaust stack. The cylinder featured a flange which allowed two Phillips screws to attach the cylinder to the crankcase.

Conversely, the machined aluminum head was held to the cylinder by four fillister head bolts. Piston was of steel (unhardened as of last reports) with oil grooves in the top end and a milled bypass slot in the side of the piston.

The rest of the engine was pretty much of standard production of the day with a brass wrist pin, connecting rod of cast aluminum fitted with bronze bushings, a one-piece crankshaft of hardened steel with the rotary valve milled in the shaft.

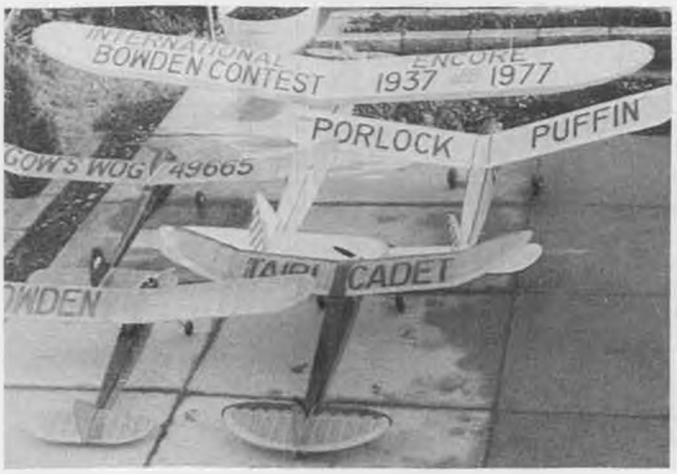
A bronze main bearing provided the support for the crankshaft and this was pressed into a permanent mold aluminum crankcase. Back cover, which screwed into the crankcase, was also of the same material. Also of cast aluminum was the timer, an enclosed type. Needle valve was very much like the Universal needle valve being marketed at that time.

The engine was neatly finished off with a light sheet metal tank that fitted into the crankcase cover, being held with a long screw. The unit sold for $18.50 at that time and was considered one of the better engines of that class displacement. Like all engines that fail to keep up with the competition, the Vivell .35 gradually faded from the competition scene. By 1946 several new models bearing the Vivell name (built by Jim Brown of Little Dynamite fame) made



What a rare Lindberg Hornet looks like. Original plans were published in PA.

An Alvie Dague Mulvihill Winner by Jerry Persh. An excellent rubber performer.



You shouldn't have any trouble identifying these models built by that prolific English modeler, Dave Baker, of London.

Pete Vano's king-size Powerhouse is said to be real kicks to fly. Looks like about a ten or eleven-footer. Vano photo.

their appearance, but this is another story we will feature in a future issue.

SAM TRIVIA

Lin Haslam reports in the "Condenser," official word of the Salt Lake Antique Modelers (SLAM), that the 1979 SAM Champs were bigger than first announced. Late entries and a recount showed 91 contestants flying 358 free flight entries and 100 R/C entries. Only 63 modelers indicated their age on the entry form (and we kid women about not admitting their age). This gave an average of 49.6 years old. Lin says this really shoots down the theory of "kids and their toy airplanes." Also, Lin says we have been duplicating the Old Timer era for twice as long as it actually existed; 1934 to 1943 is nine years. We have been at it since 1960!

CALIFORNIA OLD TIMER SCHEDULE

Many thanks and congratulations are in order for West Coast SAM Vice President Jim Adams, as he has successfully coordinated all meets for the 1980 calendar year. This great news means that modelers can now go to a F/F meet or an R/C meet with no fear of missing a good contest.

R/C

March 9 ..... SAM 30, Browns Valley
April 13 .... SAM 21 R/C Texaco, Taft
May 24,25,26 .... West Coast R/C SAM Champs, Sacramento
June 15 ..... SAM 21, R.O.W., Calero Dam, San Jose
August 24 ..... SAM 27 Two Rock C.G. Station
Sept. 14 ..... SAM 21, Hill Country, Morgan Hill
Oct. 13-14 .... Pond Commemorative (SAM 26), San Luis Obispo
Nov. 9 ..... SAM 30, Sacramento
Dec. 7 ... SAM 49 Annual Texaco, Taft

F/F

Jan. 27 ..... SCAMPS Bowden, Lake Elsinore

Continued on page 105

1938 Jasco Flamingo

OLD TIMER Model of the Month

Designed by: Roger Hammer

Drawn by: Al Patterson

Text by: Phil Bernhardt

* * *

• We had no sooner decided to feature the Jasco Flamingo as the Old Timer of the month, when here comes an issue of the SCIFS newsletter, the "Flightplug," and therein was a copy of the original Flamingo mini-drawing by Frank Zaic that first (and only) appeared in the 1938 Jasco catalog. It was originally designed by Roger Hammer in September 1937 and has remained virtually unknown to most O.T. enthusiasts ever since . . . at least up until about four years ago, when John Pond showed up at a contest with one. It was the first time I had seen one of these rare birds, and while I thought it was a neat looking airplane it also struck me as having a "different" look about, something hard to put into words. You'd have to see one in person to know what I mean.

This airplane is an excellent performer both as a free flight and as an R/C model. The original drawing includes these notes: *Has excellent spiral stability. Flight characteristics: tight circle, very steep climb, tight circling glide and ballooning tendencies.* That pretty much tells it like it is. More than once I've seen John flying his Flamingo . . . it's R/C . . . in his usual manner, i.e., stretched out in a lawn chair, beer in hand, transmitter sitting on the ground and the model way up there, methodically going round and round all by itself for several minutes at a time. No doubt about it, the Flamingo flies darn well as a free flight.

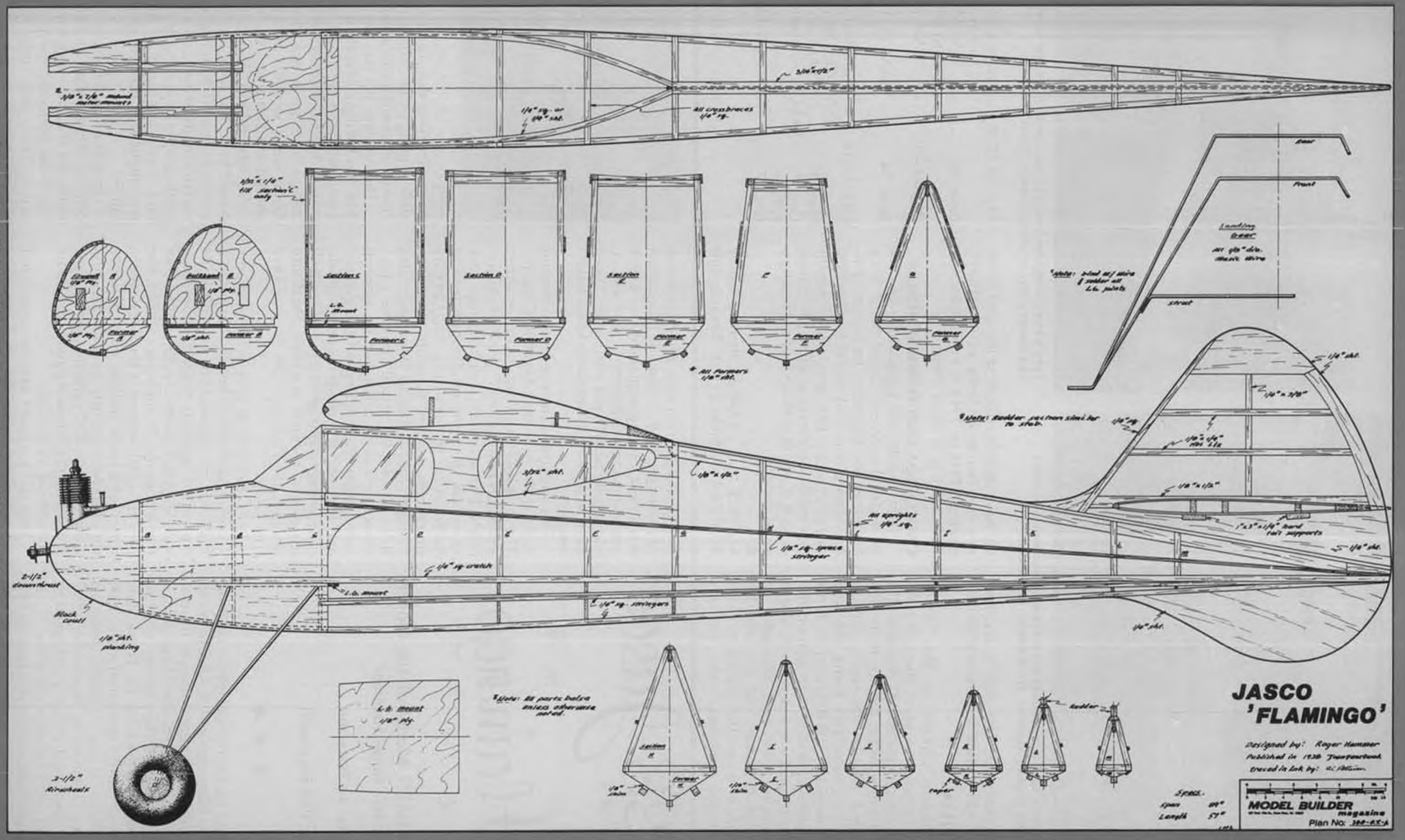
Let's take a close look at this airplane. The wing spans 89 inches and has approx. 1122 sq. in. (maximum size glow or converted ignition engine under present SAM R/C rules is a .49). Other than the whopping 15-inch root chord, the only unusual feature is the 3/8x2-inch-wide solid balsa trailing edge. Choose this board carefully to avoid excess weight. For an R/C version, spruce spars, at least on the inboard panels, would be something to consider.

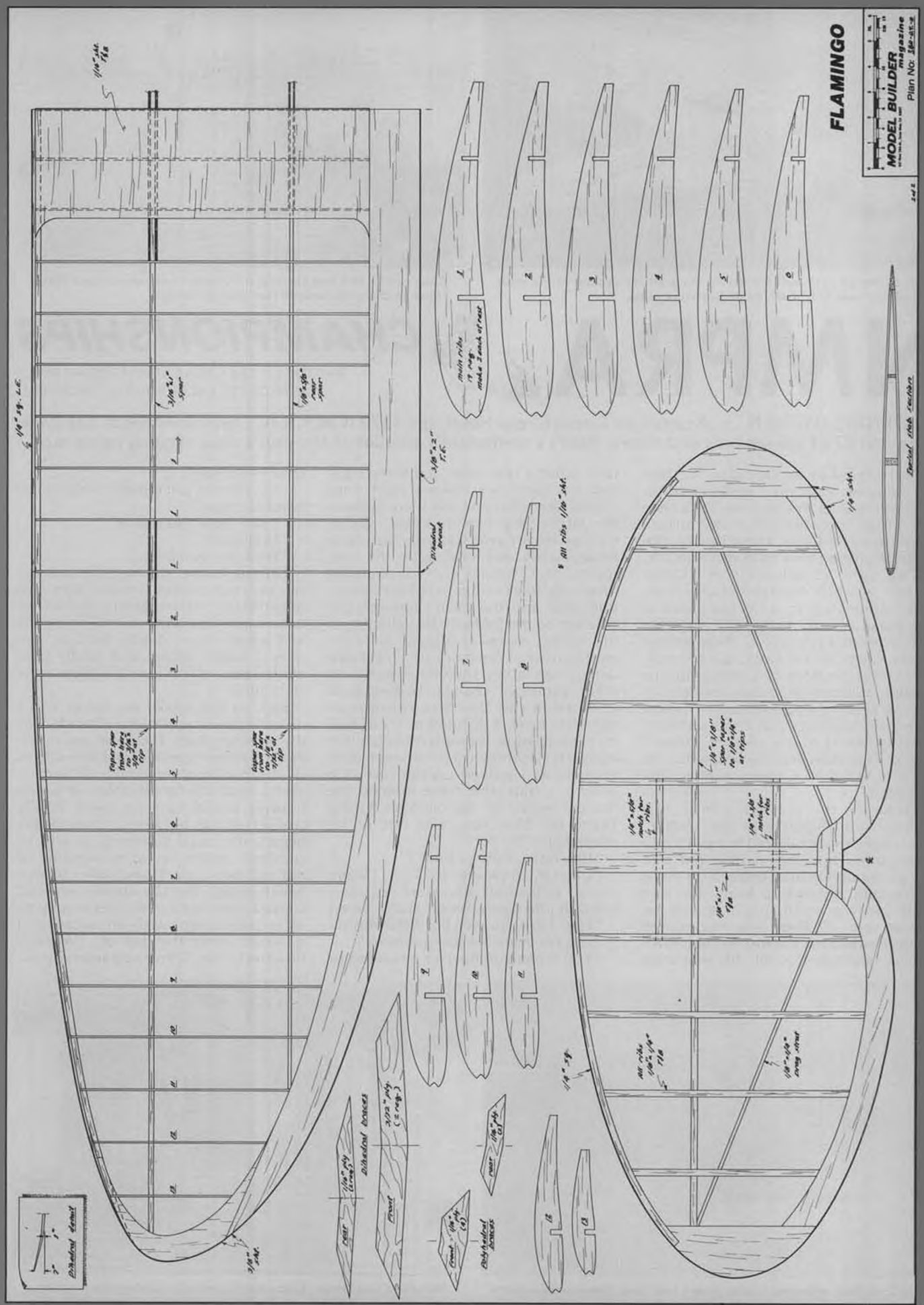
The tail surfaces are conventional except that they make use of cap strips

bent over a spar in lieu of regular sheet balsa ribs. Also, the plans call for a 1/4 sq. stab leading edge, but that tight curve makes laminating this piece a necessity.

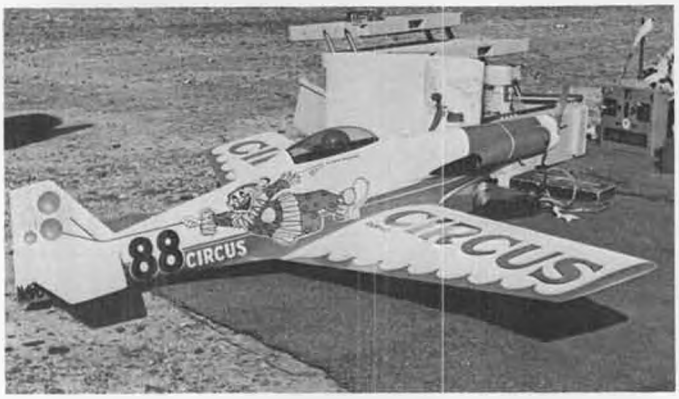
The fuselage is a curvaceous structure that has hardly a straight line anywhere. Construction is very light, and there are only a few formers to make. The Flamingo fuselage is notorious for being quite weak in the nose, and builders should see that this area receives some extra beefing up. A reinforced crutch would help, but what is really needed is some diagonal bracing or plywood carrythrough members to absorb the loads properly. This is especially important if you are building the model for free flight and plan on using a pop-up tail DT.

Up at the top left-hand corner of the original Frank Zaic drawing was this note: *Kit for this design ready soon — watch for announcement.* Hmmm, let's see . . . that was only 42 years ago. Shouldn't be long now! •


JASCO
'FLAMINGO'
Designed by: Roger Hammer
Published in 1938 Jamportbook
Traced in ink by: W. Hatton
MODEL BUILDER magazine
Plan No: 38E-RX-A
Span 48"
Length 57"
Landing Gear
Rear
Front
Strut
Rudder
Stabilizer
Section A
Section B
Section C
Section D
Former A
Former B
Former C
Former D
Former E
Former G
All formers 1/16" sht.
All uprights 1/16" sq.
1/16" sq. spruce stringer
1/16" sq. stringers
1/16" sq. crutch
1/16" sht. planking
Block sault
2-1/2" downthrust
2-1/2" Aircraft
L.G. mount
1/16" ply
1/16" x 1/2"
1/16" sht.
1/16" x 3/16"
1/4" sq. or 1/16" sht.
All crossbraces 1/16" sq.
3/16" x 1/2"
1"x3"x1/8" hard tail supports



FULL SIZE PLANS AVAILABLE — SEE PAGE 108



Jerry Boyce gets our vote for having the prettiest airplane at the meet. Placed 8th, uses S.T. X-40, Kraft Signature radio.

They're off! Jeff Bertkin flags off another heat, one of over 100 flown in the wind-delayed two days of racing.

NMPRA CHAMPIONSHIPS

PHOTOS BY LAS VEGAS NEWS BUREAU, WALT SCHRODER, AND ROCHELLE THOMPSON

By DENNIS O'BRIEN . . . Assisted by Circus Circus Hotel, the 1979 N.M.P.R.A. Championships at Las Vegas attracted 87 of the nation's best racers. Here's a contestant's account of the year's most exciting pylon race.

• Arriving by air on Thursday, the 18th of October, with my "ageless" father (and sponsor of this trip), we had a taste of things to come when the airline captain called our attention to the Grand Canyon below us. A more breathtaking sight, compliments of Mother Nature, would be hard to find anywhere. Brief moments later, a city looms out of the distance, and situated in the middle of nowhere is Las Vegas . . . the town that never sleeps, where clocks are nonexistent, entertainment of a caliber unsurpassed, millions of dollars thought of only as plastic chips, a melange of neon signs and buildings that boast architectural genius, a true grownups' Disneyworld. This, then, was the setting for the 1979 N.M.P.R.A. Championships "Big Go West."

Once on the ground, a brief trip through the airport with our "coffin" containing model aircraft brings a stir to some other travelers as dear old Dad keeps mumbling loud enough for those in listening distance to hear, "I'm sure glad Joe was small, still a shame he passed on. . ." Then into our rented station wagon for the trip through town to the headquarters for this year's big race. After a few miles and some right and left turns, we make a right onto Circus Circus Avenue and there faces us the largest Big Top in Vegas, Circus Circus Hotel and Casino, our race headquarters and lodging for the next several days. A quick entry through the revolving doors brings us to the registration desk and the casino immediately adjacent to the lobby. A first glimpse of the casino makes it appear as never ending rows of slot machines, blackjack tables, crap tables, roulette wheels, and other games of chance. Feeling kind of small in this limitless vastness of nameless faces, I decided to try to find my racing partner, or some other familiar body who resembled a pylon racer. Sure enough, as I walked up the first aisle nearing a crap table there loomed the fearless leader of the Samurai Racing Team, Jim Shinohara, and one of his pilots, Dave Shadel.

"Jim, Dave, how ya doin'?"

"Uh, OK, how are you? . . . Damn, craps!" (Obviously, they were not interested in idle conversation at this time.)

"Fine, have you seen Bill Williamson?"

"Uh, no, man, we just got here."

"You mean you haven't unloaded or checked in yet?"

"No, not yet, just thought we'd try our hand at craps."

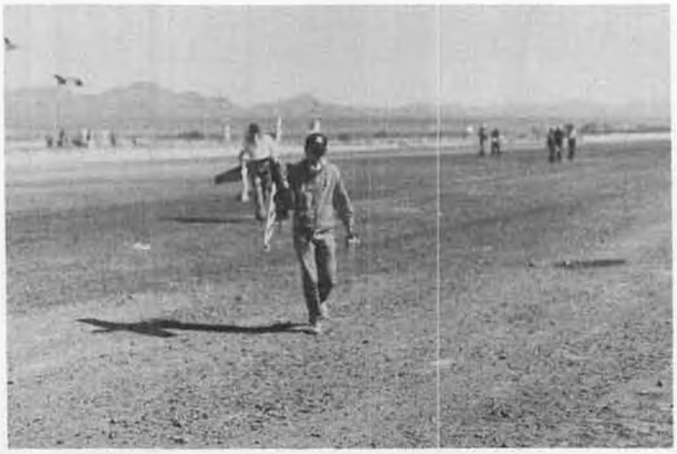
"Yeah? how you doin'?"

"Don't ask!"

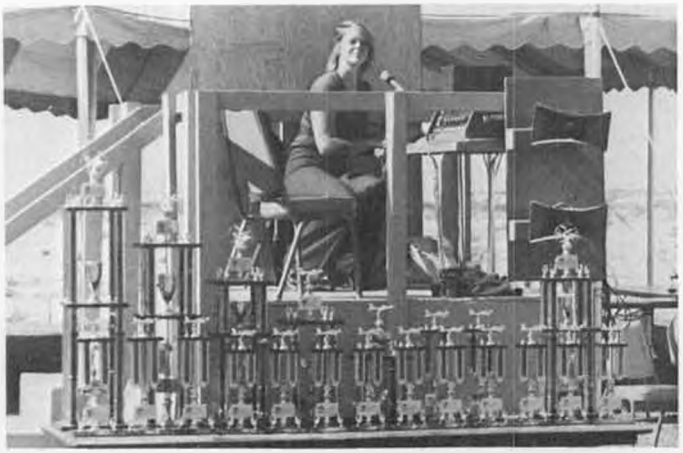
"Well, see you later."

Drifting further through the casino, I ran into some other familiar faces who informed me that my partner and several others were checking out the flying site and would return shortly. Well, at least now I wasn't alone, and finally concluded that I was at the right place at the right time.

Back to the lobby, my father and I picked up our room keys and headed for the fifteenth floor. The room was much more than we expected, and afforded us all the comforts we could ask for . . . even a small safe for valuables, for which I surely would have no need. Finally conversations between other racers began, the usual gathering in one or another's rooms for some meeting of old and new friends and some serious bench racing. The talk usually centered around someone's new killer engine or ultra-trick prop, with an occasional question along the line of, "Where's Brodbeck?" or, "Have you seen anyone



Tom Castillano returning to pits after a heat race. Note distance from race course to pits; safety was number one priority.



Monday's announcer, Linda Smith, proudly displays the trophies sponsored by Bill Bennett. Trophies went all the way to 20th place.

The Smith brothers, Chuck (seated) and Bob, put out a total effort not only at the contest but at the annual banquet as well.

Two Lil Tonis, wingtip to wingtip, round the number one pylon together. That's *close!*

yet from the northeast?" The usual reply was, "Not yet, but check down in the bar." Discussion between wives and girlfriends was anything but pylon racing, mostly what talent they wished to see and what time to be ready to make a given show, and then trying to convince their male counterparts that prop carving can wait until later . . . after all, this is Las Vegas . . . a time for fun!

Friday morning arrived with what appeared to be continuing beautiful weather, and many took advantage of this for test flying. Sorting out the right fuel/needle valve/prop combination was a bit tricky for some in the warm, extremely dry climate. By mid-morning several racers had arrived at the field and a test flight line soon formed with as much as a half-hour wait for one test flight. This gave many a chance to look over the flying site, which was exceptional and had only one obvious drawback. The entire asphalt airstrip was surrounded by a two-foot-high wooden post fence. This meant that utmost care had to be taken on long rollouts or short approaches. I understand from one knowledgeable source that the purpose of the fence was to discourage vandalism to the facility by people in four-wheel drive desert vehicles. The airstrip itself was extremely smooth . . . long and wide (600 x 100 feet) with pit area and covered lean-to for sport flying. The area surrounding the field was rocky, sandy terrain, and not at all forgiving to those who made their landing approach too short. Some of the danger of a long rollout landing approach too short. Some of the danger of a long rollout with possible contact with the fence was alleviated when the Parks Department, which governs the field, assembled a nylon net fence at the extreme upwind end of the runway. The usefulness and ultimate demise of the gesture will soon be seen.

As test flying progressed, the nylon net saved at least two aircraft, but then things began to change. The wind began to blow, first gently, which helps when slowing down aircraft for landing. Unfortunately, it began to blow in a direction directly across the runway. Still, preparations continued at the field with a large canvas sign placed over the entry to the flying area proclaiming a welcome from the N.M.P.R.A. and Circus Circus to the 1979 N.M.P.R.A. Championships. Another crew was erecting the large pink and white tent, compliments of Circus Circus Hotel and Casino, which would serve as shelter and also for transmitter impound. As the afternoon wore

All that remained of the welcome banner after Friday night's big blow.

on, the light crosswind began to worsen, with now heavily gusting blasts making several hardy souls unleash all their skills, trying to land those squirrely racers in the less-than-ideal wind conditions. To further complicate matters, the wind began switching to where landing towards the safety net was no longer feasible, and placed the net on the now crossed-downwind end of the runway, rendering it useless for the present. The course had also been set up with the approach to Number One pylon now on the downwind end of the course. The

Air Force Thunderbirds were practicing nearby provided a free show for all.

Team that did it all, Kathy and Bob Root, with their 1st place Stinger. Bob had a perfect score, ripped off a 1:14.1 in fly-off.

Tennessee's Greg Doe always turns out beautiful models, new Polecat is no exception. K&B power, Kraft R/C system.

Leaping into the air, two racers sprint for the scatter pylon. Note taxiways and smooth asphalt runway, and also the sometimes detrimental wood post fence surrounding airstrip.

Illinois' Bill Preis depended on tried and proven Lil Toni/Terry Tigre combo to nail down 4th place. Bill is '79 Nats Champ also.

Our ace reporter with muraled Polecat. Says he didn't fare too well due to "dumb-thumbs."

Smiling Pete Reed, past NMPRA Prexy, placed 6th with Tigre-powered Polecat. Variant R/C.

Bob Root proudly displays his beautiful 1st place trophy. Pam and Linda Smith look on.

wind continued to gather strength and began to tear at the safety net, the welcome sign, and the large tent. All present began to mumble brief prayers for better conditions on Saturday, and Eric Meyers even sacrificed his LR1-A on a test flight, all in hopes of appeasing the god of ill wind.

Returning to the hotel, activity centered around preparing aircraft for the static judging to be held across from Circus Circus at the Recreational Vehicle facility. As I and several others exited the hotel for the brief walk across the street, we were greeted with a gale force wind which tried its best to make my two aircraft (one under each arm) part company from me. Upon arrival at the building area set aside for processing, aircraft were first subjected to a rigid safety inspection, pre-entries processed, and planes reassembled for static judging. I must say, it was a pleasure to witness the speed and fairness exercised by the judges, Bob and Chuck Smith and Jeff Bertkin. They more than knew their job, and I don't recall hearing any derogatory remarks about how planes were handicapped. The most outstanding aircraft award was kept secret until Saturday's Banquet.

Having now mentioned Bob and Chuck Smith leads me to a well-deserved show of appreciation to these two gentlemen for the outstanding job they performed as Co-Contest Directors for the entire event. Through their efforts and those of Walt Schroder, we were able to hold this prestigious event in Las Vegas. With the help of the entire racing

Continued on page 69

Eric Myers displays unique finish scheme on K&B powered Polecat. Eric was in contention for 1st place until a lean run forced him out. Emron and K&B finish.

Bill Bennett congratulates candidates for first place honors; Ron Gilman (left) and Bob Root. In the fly-off Bob copped first place, but it was mighty close.

FREE FLIGHT AND CONTROL LINE

Bill Noonan, San Diego, California, has equally superior talents in model building and photography. This 30-inch span "Missel Thrush" rubber scale ship, and the photo thereof, illustrate the point.

Mike Spindler, Curtis Spindler, and Rich 'von' Lopez among some *very* nice company, a few of the local high school song girls who acted as cheerleaders for the San Francisco 49'ers at this particular game against the Los Angeles Rams.

PHOTOS BY DAVID HOM

COMBAT AT CANDLESTICK

By RICH 'von' LOPEZ . . . It isn't very often that modelers get the opportunity to demonstrate their craft before 49,000 spectators. The Flying Tigers Club certainly made the most of it!

• On any Autumn Sunday, San Francisco's Candlestick Park is the scene of physical combat between two professional football teams. November 25, 1979 was no exception, but during halftime the 49,000 plus fans were treated to a different type of combat: model airplane combat.

Steve Gherety is the man responsible for the Flying Tigers Model Airplane Club combat demonstration during the San Francisco 49'ers vs. Los Angeles Rams professional football game. I met Steve at the airport in Lincoln, Nebraska before the 1979 Academy of Model Aeronautics (AMA) Nationals. I had gotten off the 727 carrying two 1/2A Combat models, a suitcase and a shoulder bag. I went outside the terminal to hail a cab and low and behold, not a one in sight. Lincoln's airport is not one that does a high volume business. The next thing to do is either rent a car or hitch a ride from a modeler going to AMA headquarters. At that time I ran across a giant model box with lots of AMA stickers and Free Flight decals. I introduced myself and asked for a ride to AMA HQ. The box belonged to Steve, and he was quite surprised to hear the name Rich von Lopez, as he had been trying to contact me back home in San Francisco to set up a demonstration for the 49'ers.

After the Nats, I presented the ideas to some of the Flying Tigers Club Members. All were very enthusiastic and optimistic. Jo-Hsu Wu, Mike, Curtis and

Fast Combat action between Rich 'von' Lopez and Jo-Hsu Wu. Jo is a second-year WAM expert, while Rich is starting his thirteenth year as a WAM expert.

Mike Spindler and Rich 'von' Lopez are both former WAM Overall Combat Champions, flew Rich's Matador design in half-time exhibitions.

Rich DeMartini and Mike Spindler doing battle with Slow Combat models. Throughout all of this demo flying there were lots of cuts and no crashes, and the crowd really loved it.

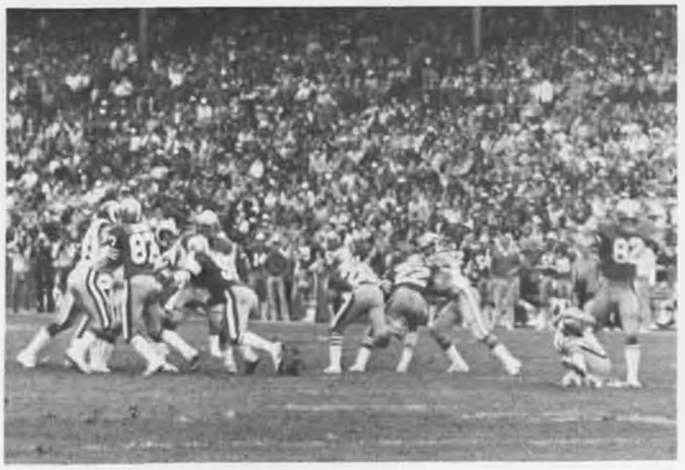
Rodger Spindler, Rich De Martini, Bob Lordier, and myself were to be the crew for this project. We would be given twelve minutes in which to put up as many flights as possible. We also had to carry our equipment out, set up and get everything off the field during those twelve minutes. Our plan was that Mike Spindler and Rich De Martini would go up first with some Slow Combat models and fly for as long as they could. Then Rich von Lopez and Jo-Hsu Wu would go up with some fast combat models. In the meantime, Spindler and De Martini would stand by with their Fast Combat models and go up as soon as one of the others came down. As things turned out, the Slow match went the distance of about 4-1/2 minutes with no crashes and lots of cuts. The match between Jo and myself also went the full time period (until the tanks ran dry). Jo's model came down first. In a matter of seconds, Rich De Martini had his model in the air, in time to dice around with Rich von Lopez before his model ran out of fuel. When von Lopez came down, Mike Spindler was ready to launch. Mike and Rich again ran their tanks dry. It was then time to get off the field.

We used red and gold vs. blue and yellow streamers to get some crowd reaction. It worked! You should have heard the cheers as some bits of blue and yellow came fluttering down. The crowd responded to what looked like tricky maneuvers, close passes, and near misses to the ground. It was mostly a staged program, with no one really going out for blood, and as a result none of the fliers lost any equipment. It was the first time in the history of the Flying Tigers that they had performed for and entertained such a large audience. Mike Olmstead, the entertainment director for the 49'ers organization, was delighted with the program and wants the Flying Tigers to do it again in 1980.

Rodger Spindler, secretary for the Flying Tigers, deserves a lot of the credit for coordinating the program with Steve. Those little things like practice sessions, game passes, parking permits, and planning the programs all require time and effort. Thanks to Steve and Rodger, everything went off like clockwork. It was a memorable experience and great exposure for our lobby. Perhaps your club might want to try a demonstration of this type sometime.

The final score for the football game was Los Angeles 26, San Francisco 20. •

Mike Olmstead, entertainment director for the 49'ers, with Rich. He was pleased with Flying Tiger club's act, wants them back for 1980.



OK, folks, back to the action!

At the '79 Nats, Marvin Denny, National Slow Combat Champ, holds Hissem's model while Tallman warms the plug clip.

Smoke, fire and brimstone, all that's missing is the sound effects. This pair decided to break in their engine during elims at Nats.

Control line

By "DIRTY DAN" RUTHERFORD

PHOTOS BY CHARLIE JOHNSON

FUNNY HOW THESE THINGS WORK OUT...

Back a few months I was going to use a write-up on the Derringer 46, done by the designer himself, Bob Whitely. That got put off once, couldn't find the text next time and so on. Good thing, too. The December '79 issue of *Model Airplane News* has the full story on Bob's Derringer, featured as a construction article. So now I needn't find my material and those interested can read a much more complete article on a truly outstanding model for Precision Aerobatics.

Speaking of good construction articles on Precision Aerobatics, the January 1980 issue of *Flying Models* features Bill Werwage's own Juno, both as a construction article and as the cover picture. Didn't take long for Bobby Hunt to do things his way at FM, did it?

ONCE AGAIN, IT IS TIME TO GET IT ALL TOGETHER

Yes, here is the section where you and I solve the problems of the C/L modelers of the world. Definitive answers to the problems of promotion, organization, and like that there. Actually, we may not come up with one single definitive answer. But we can certainly look around at what has been done by others, possibly using some of their ideas.

As previously mentioned, the F/F guys seem to have it all together. Yes, they do have problems within their organization and at times the National Free Flight Society has been close to closing its doors . . . these things aren't easy, you know. I can recall a few years back when the NFFS was being financed back into a strong position by one of its members who kicked in $1500.00 and was prepared to lose all of it, but felt that his love for F/F modeling was worth the risk. I would tell you who did this (after all, maybe we could get him involved in C/L!) but won't, as I got the story second-hand, although it came from a very reliable source.

The point is that while we can look at F/F and marvel at the things the NFFS has done, it has not been at all easy for them. I would not think that the situation would be much different for a National Control Line Society.

Now we get into how C/L can achieve some of the same goals as the F/F folk have. And that is really very, very hard. You see, the type of situation that the F/F fliers presently enjoy is not something that you can lay out a plan for. I think it is more of a spontaneous thing where one good deed leads to another, all deeds coming in a logical progression.

If it is all so logical, how come we can't lay out a plan? Hmmm . . . I think I do a lot better at asking questions than I do at answering them.

Take the Symposium Report that the NFFS publishes every year. Have you ever seen one of these things? All manner of really technical stuff, all pertaining to the better flying of F/F models. Now, when the idea for the Report first took shape, surely nobody knew what form it would have a few years down the road. But the first issue was completed, and when reading it, a number of people probably saw that they could either do a better paper on a subject or that they had access to certain facilities that would allow them to test rubber strips, wing spars or whatever, and then publish the results. Then there are a number of modelers who are so heavily involved in their own favorite event that they just dig into it really hard and come up with interesting material. Their search for more performance actually parallels the efforts one would expend if doing a technical paper just for the sake of the paper itself. So they have learned what they wanted to know, have the records to serve as notes, usually have achieved outstanding performances in whatever class of flying they are involved in, and so doing a paper for the Symposium is not that difficult a thing to do.

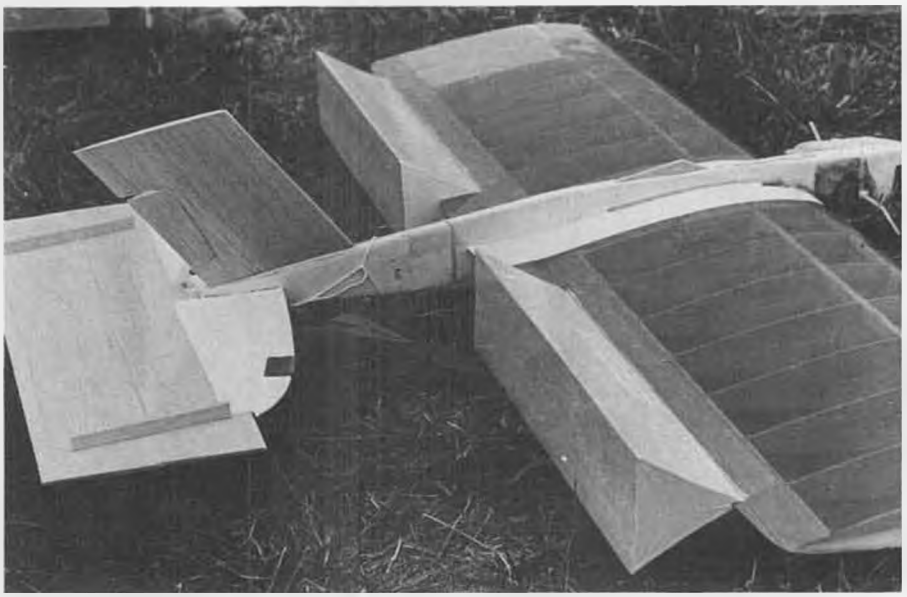
Notice that the subjects of many of these papers are so technical that none of the modeling magazines could justify publishing them as grist for Joe Average Modeler. Not all of them are, of course, but many would simply blow you away with computer printouts and elaborate graphs.

Getting back to the point, the above shows why we can't lay out a plan. The material for something like the Symposium is spontaneous, nobody knows in advance what is going to come in, so it just naturally goes along a course set by the contributors. In the case of the NFFS Symposium, this has worked out to be a very good course.

The same situation holds true for the promotion of any modeling activity . . . you can't map out a plan of action, it just has to take place on its own with a little bit of guidance now and then.

The Big Secret to the whole ball game is to get as many people as possibly covered under one organization, that organization's primary purpose being to promote C/L flying in general. Notice that I said "in general." Not just Combat or Stunt or Speed or Carrier or jet-powered Balloon Bust, but all of the separate C/L activities. Of course, the differences between Racing and Combat would need to be recognized, but I would think the common ground of all of us flying C/L models is enough to band us together into one group, each of the separate factions being able to help the others in many ways.

For right now, the big hurdle will be in getting a National Control Line Society formed, and it will be doubly hard, as it has already been tried before. I'm not sure what happened back then, but I do know there were some interesting politics taking place with two groups of



He *can't* be serious! Howard Rush's strange Slow Combat model. Nobody seems to know much about the design features, but that's probably because nobody wants to know.

people trying to form a NCLS. I stayed out of the battle, but my spies forwarded some interesting letters, at least one of which asked that members of special interest groups not align themselves with Group A because Group B already had plans that would soon gel. Nobody knew what to do, and the result was that we are still lacking a national C/L organization. Nice work, people.

One solution might be to seek help from the AMA. I feel they owe us one anyway, as the present bunch of special interest groups would not have any reason to exist if the AMA was actively trying to serve its members. Think about that. Why should we have to belong to the AMA and then also form a separate group for promotion of each event when all of these events fall under the umbrella of the AMA?

Organizations don't just come popping up for no reason, and the reason we have special interest groups like MACA, PAMPA, CL-RPM, NCS and so on is that AMA is unwilling or unable to serve its own members. However, they could do us a big service by simply publishing a NCLS newsletter that would contain input from all of the present special interest groups. Membership rolls for NCLS could be handled on the computer frequently used by AMA. There are a lot of things *our* AMA could do, and recently there have been some discussions at AMA Executive Council meetings concerning the special interest groups. Possibly the time is right to push for some help at getting the National Control Line Society off the ground.

Right now I am tempted to detail some of the things we C/L fliers could accomplish through a vehicle such as the NCLS, but will not do so. It would all be for naught if the NCLS never gets formed. Instead, look at what the folks at PAMPA have done for what used to known as "Stunt," and is now Precision Aerobatics. Their event is no doubt the most fun to be involved with of any event flown (not just C/L events) at the Nationals. Their rules are stable and are also what they want them to be. Their newsletter is really good. The event itself is very healthy, in fact is easily the healthiest of the C/L events. What PAMPA has done for PA could easily be done for all of the C/L events, given a national organization to work with.

SHEW ON TEAM RACE

Got a really good piece here to pass along to you, lifted straight out of the most recent issue of the Albuquerque T-Birds newsletter. Phil Shew explodes a lot of the myths shrouding FAI Team Race. Maybe a bunch of you will read it and decide to get in on the act; there is presently a lot of interest in this event.

"TEAM RACE: THE BIG LIE

"If you believe everything that has been written about Team Race over the past few years, I'm sure you're convinced that only God's chosen few are capable of flying this event. That's because virtually everything there is to read is aimed at the world class competitor. I don't know about you, but most people I know aren't born world class anything. Normal people have to suffer through the ignominy of an apprenticeship before eventually becoming a competent journeyman. It's another quantum jump from journeyman to world class status. The problem is that nobody bothers to tell us mortals that we don't have to be world class competitors to fly and enjoy Team Race. You don't need a college degree in metallurgy, the dexterity of an escape artist, or an expensive machine shop . . . in fact, you don't have to have lots of things including:

A team mate
Pressure refueler
Internal leadouts
Retracting gear
Fiberglass fuselage
Hand built motor
Anti-gravity balsa
Unobtanium of any kind

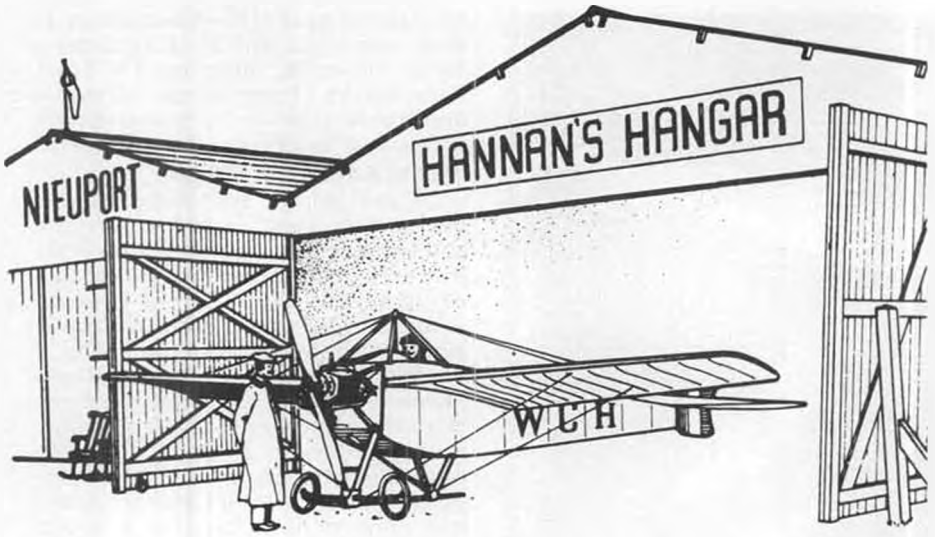
"What! No team mate? No machine shop? Ole Shew's really flipped out this time! Maybe so (the old lady has been convinced for years), but I've got some old fashioned logic to lay on ya. So sit back, relax, and let's cogitate on a few things.

"1) A team mate is nice for sure, and probably an absolute necessity if you have world championship aspirations. But waiting to find a perfect team mate before starting a plane, is like waiting to find a wife before playing house. For local or even national level competition you can pick up a pilot (or pitman, depending on your preferences) at the contest, just like lots of people do now for Goodyear or Slow Rat. Believe me, there's a lot of learning to do before

Continued on page 93

"Black Glove" Kit Gerhart gets ready to fire up Howard Rush's Fast ship, Mike Guthomson holding on.

What a trio! Sherwood Buckstaff tunes, Rick Stubblefield tells him how and Mike Guthomson is still holding on.



"Science never solves a problem without creating ten more."

• Our lead-in line this month is by a writer of some note, one George Bernard Shaw. We leave you to figure out your own connection with model building and aviation!

WOODVALE '80

Contest director Bernie Sinclair reports that he plans another international free flight scale event for Woodvale in mid 1980, and suggests that this advance notice allows plenty of preparation time for those who may care to participate. The 1979 affair attracted entries from the host country (England), Czechoslovakia, Japan, and the United States. The latter three countries were all represented by mailed-in, proxy-flown models.

It seems likely that at least two other countries may be represented in 1980, making the contest truly international, even by skeptical FAI standards. Qualifying times for rubber-driven entries will likely be reduced to 20 seconds, helping to ensure the chance to compete on more even terms with the power-driven entries, and even putting Peanuts in contention, assuming they are of adequate accuracy, detail and workmanship quality.

Summing up the 1979 event, Bernie states: ". . . the contest fulfilled its first and foremost requirement in that it was enjoyed by all who took part, and I think proved that there is a healthy interest in free flight scale, not only in this country, but throughout the world."

DOWN-UNDER RULES PROPOSAL

Merv Buckmaster was interested in Dick Baxter's idea to increase the amount of *flying* in F/F scale contests, and reports upon an Australian concept. The idea is to put the onus on the flier and allow him three official flights; the total time for them would count towards his score by being given a percentage of the three-flight time total of the highest scorer. For example, if Flier A gets 35 seconds plus 120 seconds plus 99 seconds, that equals 254 seconds. Flier B gets 77 plus 133 plus 115, equaling 324 seconds. A score 254/324 = 78% or 78 points, while B gets 100 points.

The crunch comes in not imposing a max for flight duration, but requiring the models to land within sight of the launching area, i.e. the judges must see both the takeoff and landing. So it is up to the flier to govern his engine runs in relation to the weather and field conditions!

Another Australian proposal aimed at improving the *quality* of scale models, is the deducting of points for out-of-scale measurements. The more inaccurate the model, the more points lost. Starting with 100 points, 10 features of the aircraft are measured. One point for each 1% out-of-scale per feature is deducted. With several measurements more than 10% out, one might end up with a negative score!

THE REAL ENERGY CRUNCH?

While a great deal of finger-pointing is going on regarding increased fuel costs and scarcity, it is interesting to note that the U.S. Department of Energy now employs nearly 23,000 bureaucrats, who cost the taxpayers more than $12.3 billion each year. This is more than the combined profits of the eight largest oil companies in the country. And this energy produces absolutely nothing except rhetoric and confusion! Anyone for hot-air balloons?

How's this for a collector's item? A full bottle of genuine ELF MOTOR FUEL, belonging to the Russ Barrera Museum.

NEW NEST FOR SPRUCE GOOSE?

In the seemingly endless saga of what to do with the giant Howard Hughes flying boat, UPI reports that Long Beach, California, port officials have tentatively agreed to moor the craft near the Queen Mary liner, and permit public viewing of the fabled craft. Well, maybe.

HOBBY OF THE STARS!

Model builders have long suffered the slings and arrows of depreciation for our "childish" pastime. Well, at least we are traveling in distinguished company. According to the October *Aeroplane*

Pete Farrimond holding Milan Kacha's Zlin, which Pete proxy flew to 5th place at the 1979 Woodvale F/F Scale contest in England. Photo from Doug McHard/Bernie Sinclair.

Monthly magazine (England), film actors James Stewart and Henry Fonda are modeling fans. Stewart fondly recalled a rubber-powered NC-4 which succeeded in taking off of the water under its own power. The latest project is a joint Stewart/Fonda venture, the construction of an engine-assisted R/C sailplane.

SUPER GRINGO!

School teacher Shermar Gillespie, winner of **RCMS's** Grand Peanut postal award, was given a nice write-up in his school newspaper. The reaction of the students in his Spanish language class? They now address him as "el gran cacahuete!"

DISAPPEARING BREED?

A recurring philosophical theme in this hobby is the shortage of newcomers with enough enthusiasm for long-term participation. Some doom-sayers predict that model aeroplaning will gradually fade away altogether, for lack of replacement troops. Herb Kelly, of Yucca Valley, California, feels the root of the problem is that most people just don't want to take the time to investigate the merits of the hobby, preferring instead some form of "instant gratification" pastime: "Throughout the years some few have remarked about my models . . . particularly the ones that flew . . . and asked where did I get the kit. But when they found out the models were scratch-built from my own plans, they walked slowly away." Herb feels that this is not necessarily related just to modern life-styles, either . . . but rather, is a long-standing situation. "The model builders of my generation were interested in historical planes, and *had* to scratch-build or forget it . . . I came in when 'Ideal' (the model kit company) was in its heyday . . . I did not have much spending money, so had to use what I could lay my hands on in the Naval Hospital Hobby Shop, until one day they got in a whole lot of spruce. I used that for some years until I bought some blocks of balsa from the Ryan aircraft plant scrap yards.

(Ryan used balsa in wing tips and strut fairings at the time.) In 1930, a neighbor boy got a Wakefield kit for Christmas and asked me if I would build it for him.

Bill Hannan and one of his seemingly endless string of Farmans, seen here at the 1979 Flightmasters Annual. Photo by Woody Woodward.

This was the first time I ever worked with 1/16 square balsa. I had much trouble with breakage, but finally got the model done and ready to fly. Well, the boy's mother hung it up in his room and that was that!"

Herb is now long retired, at least in theory, but continues to work on aircraft projects, both full-size and models, and he feels his early experience has paid off in many unexpected returns all through the years.

FAC AND AMA NATS BACK TO BACK?

Yes, it may happen. If all goes according to plan, the Second Flying Aces Nationals will be conducted in Ohio near the site and date of the AMA Nationals, according to FAC C.D. Frank Scott. In addition to builders from the Dayton, Ohio area, assistance will be provided by the Cleveland Free Flight Society, which should allow an expanded schedule of events over last year's super-successful flying scale extravaganza. More details should be available soon.

AF MUSEUM CELEBRATES BIRTHDAY

While we are discussing Ohio, the Air Force Museum located there has just passed its 56th year and is still growing, according to information sent in by Bob Farrenkopf. Started during 1923, the museum was the outgrowth of public curiosity concerning captured WW-I aircraft which had been brought to McCook Field, in Dayton, for testing. Today the facility is recognized as the largest and oldest military aviation museum in the world. Over 150 aircraft are on display, while another 650 are on loan to other institutions or being restored. Among recent acquisitions was a 92-foot WW-I style Caquot observation balloon, helping to add diversity to this most outstanding collection.

ATTENTION AERO PHILATELISTS

Some new U.S. postage stamps of special interest to aviation enthusiasts have recently been issued. Two of them are devoted to Wiley Post, and feature his famed Lockheed "Winnie Mae." The denomination is the seemingly seldom employed 25 cent value.

The other stamp, a 15-center, features Wiley Post's favorite passenger, Will Rogers. It seems rather ironic that these

Continued on page 85

Charming Shirley Baxter compares expressions with Joe Tschirgi's DFW Floh during recent Flightmaster contest.

Bill Noonan's latest masterpiece is this 30-inch rubber-powered Missel Thrush, built to 1.10"=1' scale. Noonan photo.

PEANUT SCALE

'Quail'

2-in-1 SCALE FOR THE BEGINNER

PHOTOS BY FUDO TAKAGI

By WALT MOONEY . . . The Aerosport "Quail" is such a simple model that Walt is presenting a "Glue Part A to Part B" article for a double-Peanut size (26") version for beginners. Peanut plans on next 2 pages.

• The Quail is a simple cantilever (no struts) monoplane design for home-builders. It is an all-metal, tricycle landing gear, high-wing monoplane with a conventional tail. It was designed to be powered by the Rockwell 600 or the Volkswagen engine. It is a single-place airplane with very good performance.

The real airplane design lends itself to being modeled very simply and is an ideal beginner's scale model. Simple, standard construction techniques are used throughout. Because this can be a first scale model for a novice, and because we haven't done so in a long time, this will be a complete "put part A with part B" type of construction article.

The model is drawn with scale dihedral, but has an enlarged horizontal tail to enhance flight characteristics. A scale length landing gear is used because it looks right and because it limits propeller diameter. A longer propeller would tend to give increased flight times, but it also might increase the beginner's trouble with adjusting the model to fly because it would be more destabilizing than the smaller propeller.

Although the model is published as a Peanut (13-inch maximum wingspan), the plans are drawn twice Peanut size (26-inch span . . . available from **RCMB**) because the beginner will have an easier time handling the larger size materials. This larger size model is the one that is described in the following construction article. The Peanut size model can be built similarly; the models in the photographs were built with an alternate wing centersection and tail surfaces so they can be disassembled and carried in a small box. This approach is not for beginners and can be accomplished by any experienced model builders without further instructions. For the Peanut size model, the omission of every other wing rib and the fuselage uprights not hatched is recommended.

The Peanut version shown has demountable landing gear which fits in slots in the fuselage, and the wings and tail have tubes to accommodate round bamboo stub spars. Disassembled, it fits in the 8 oz. See's mint box as shown. It's easy to carry on a trip but probably not suitable for a beginner.

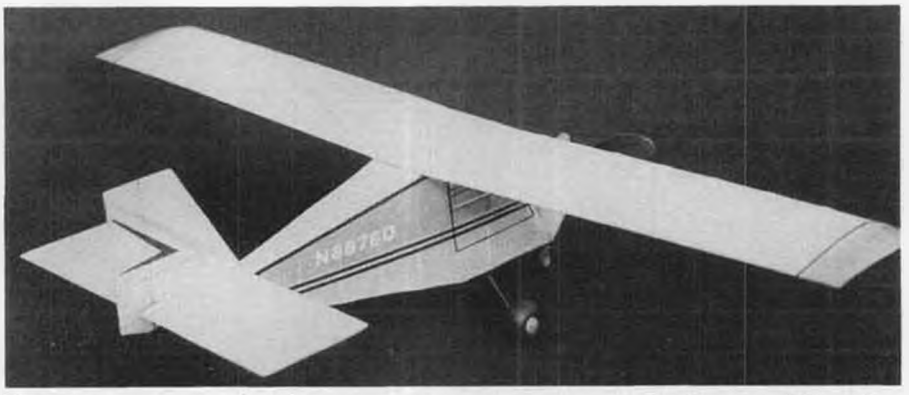
Let's start the construction of a beginner's scale model. There is a specified order to making this model. Why? The main reason is to take on the construction of the simplest parts first so that a beginner can learn and practice increasingly complex construction techniques as he goes along. If you are a beginner, follow the instructions in the sequence presented and you should be able to make a respectable first scale model with a little patience. Try not to be in a hurry.

1) TOOLS. There are a minimum of tools needed to build this model, but the following are absolutely required: single-edge razor blades (you'll need several, and be prepared to throw them away as soon as they get dull, as only sharp blades cut balsa or tissue nicely), straight pins, a soft work board (I used a pressed fiber insulating wallboard), waxed paper to protect your plans, long-nose pliers to bend wire, a 3/16-inch drill bit to make the hole for the propeller thrust bearing, some fine sandpaper, and a small paint brush.

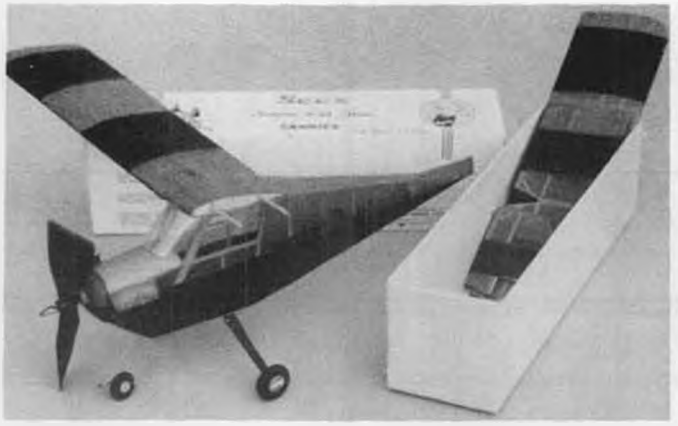
2) MATERIALS. The following materials must be obtained to build the model. They can all be purchased at any good model shop. Balsa sticks: (12) 3/32 squares, (1) 3/32x3/16, (1) 3/32x1/4, (1) 1/8x1/4. Balsa sheet: (1) 1/16 thick, (1) 3/32 thick. Balsa block: (1) soft 3/4 sq. by 6 inches long. You'll also need Japanese tissue (2 sheets), .032 piano wire, thin clear plastic sheet, a plastic propeller, the right diameter wheels, a length of 3/32 aluminum tubing, model airplane cement (not plastic model cement, either!), about four feet of 1/4-inch flat rubber, and some clear dope.

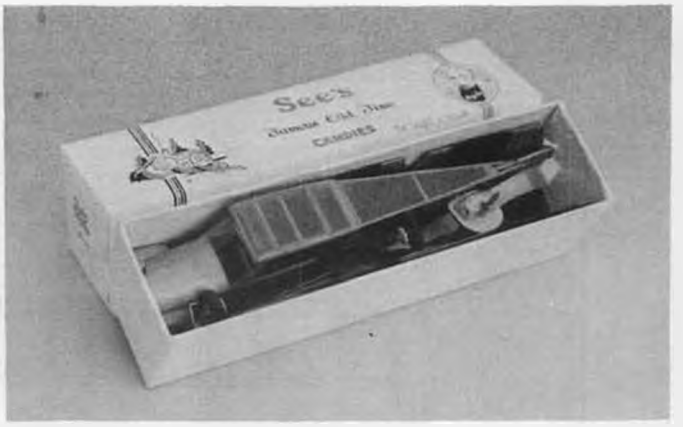
3) READ THE PLANS. Spread the plans out on the top of your work board so you can review the entire plane. Lay a covering of waxed paper over the plan. This will keep the model airplane cement from sticking to the plan as you build the parts of the model directly on top of the plan.

4) CONSTRUCT THE HORIZONTAL TAIL. It is built flat on your work board



The 26-inch version described in the text. Absence of curves, good-size tail surfaces and good proportions combine to make a model that anyone should be able to build and fly.





Walt made his Peanut Quail so that it could be completely disassembled and packed into a See's candy box. This is something best left to the experts, however, and beginners should concentrate on building and flying technique before trying anything like this.

directly over the plans. The structure consists of balsa sticks cut to length and cemented in place. The leading edge and the spar are made from 3/32 square. The trailing edge, which has a gap to clear the vertical tail, is made from 3/32x3/16. Cut this long piece to the length shown and pin in place over the plan. Do not pin through the wood; instead, use a pin on both sides of each stick in several places.

Now, using 3/32 squares, cut the cross pieces to fit and cement them in place. Use care in making the cuts so that the parts fit exactly. The cut should not be angled unless it is meant to be angled, as are the parts nearest the center where the horizontal tail has a notch to clear the rudder movement on the real airplane.

The cross pieces are called ribs. The ones at the extreme ends, or tips, are a single continuous piece, whereas all the others must be made in two pieces to allow the spar to be continuous. Allow the horizontal tail structure to dry thoroughly.

5) CONSTRUCT THE VERTICAL TAIL. This structure is very similar to the horizontal and is also built directly over the plan on the work board. Wood sizes are the same except that the triangular piece below the horizontal tail location is cut from 3/32 sheet. There is an opening in the vertical tail between the leading edge of the tail and the spar for the horizontal tail mounting. Make sure to leave a 3/32-inch space between the bottom triangular sheet piece and the longest rib.

Again, the tip rib is continuous, but the other ribs must be in two pieces to allow a continuous spar.

Leave the vertical tail in place on the work board until the cement is thoroughly dry. Don't get impatient.

6) CONSTRUCT THE FUSELAGE SIDES. The fuselage side structure is shown hatched (lots of little diagonal lines emphasizing the sticks) so that it is easy to see.

The fuselage side structure uses 3/32 square sticks for the longerons (these are the lengthwise members) and for most of the uprights. Three sets of uprights are exceptions to the previous statement. The upright at the very front and the slanted one at the front of the side windows are 3/32x1/4. The most aft upright carries the rear peg to support the rubber motor and must be cut to size from the 3/32 sheet.

To get both fuselage sides as near identical as possible, they should be built one on top of the other. Select the sticks for the longerons from the stiffest of the sticks that you have. Try to get four sticks with about the same stiffness. (One soft longeron will give you a warped or twisted fuselage later.) Pin the longerons in place on the work board. Avoid sticking pins through the wood.

There are several places where the longerons have sharp changes in direction. They should be cut and cemented back together for maximum strength at these points.

Now carefully cut the uprights and cement them in place. Don't forget to make the motor peg holes in the aft uprights before you cement them in place.

Try to make both fuselage sides exactly the same. Use enough cement to hold the uprights, but don't get too much on the joints. It's heavy, and besides, you have to separate the two sides after they are dry.

One of the biggest problems a beginner has is using too much cement and getting it slopped over everything. Try to put only a tiny drop of cement on each end of each upright before it is put in place. The uprights should be cut accurately to length so they are a good fit between the longerons. The cement that is squeezed out of the joint should be wiped up using a short length of scrap balsa stick rather than being allowed to dry and add unnecessary weight.

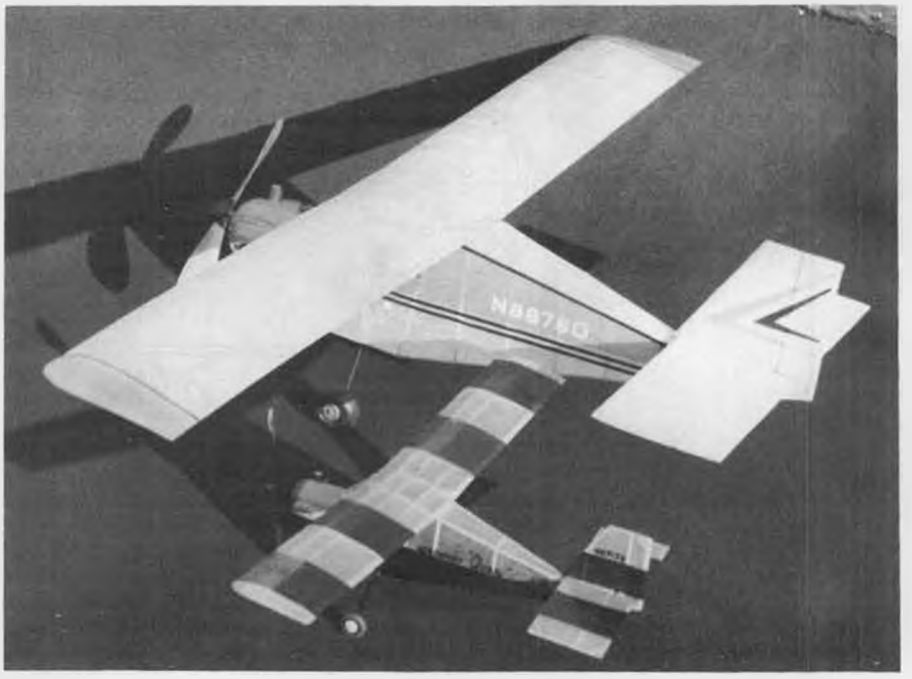
Allow the fuselage side assemblies to dry completely.

7) CONSTRUCT THE WINGS. The wings are also constructed directly over the plan and have a leading edge, a trailing edge, ribs, two spars, and wing tip pieces.

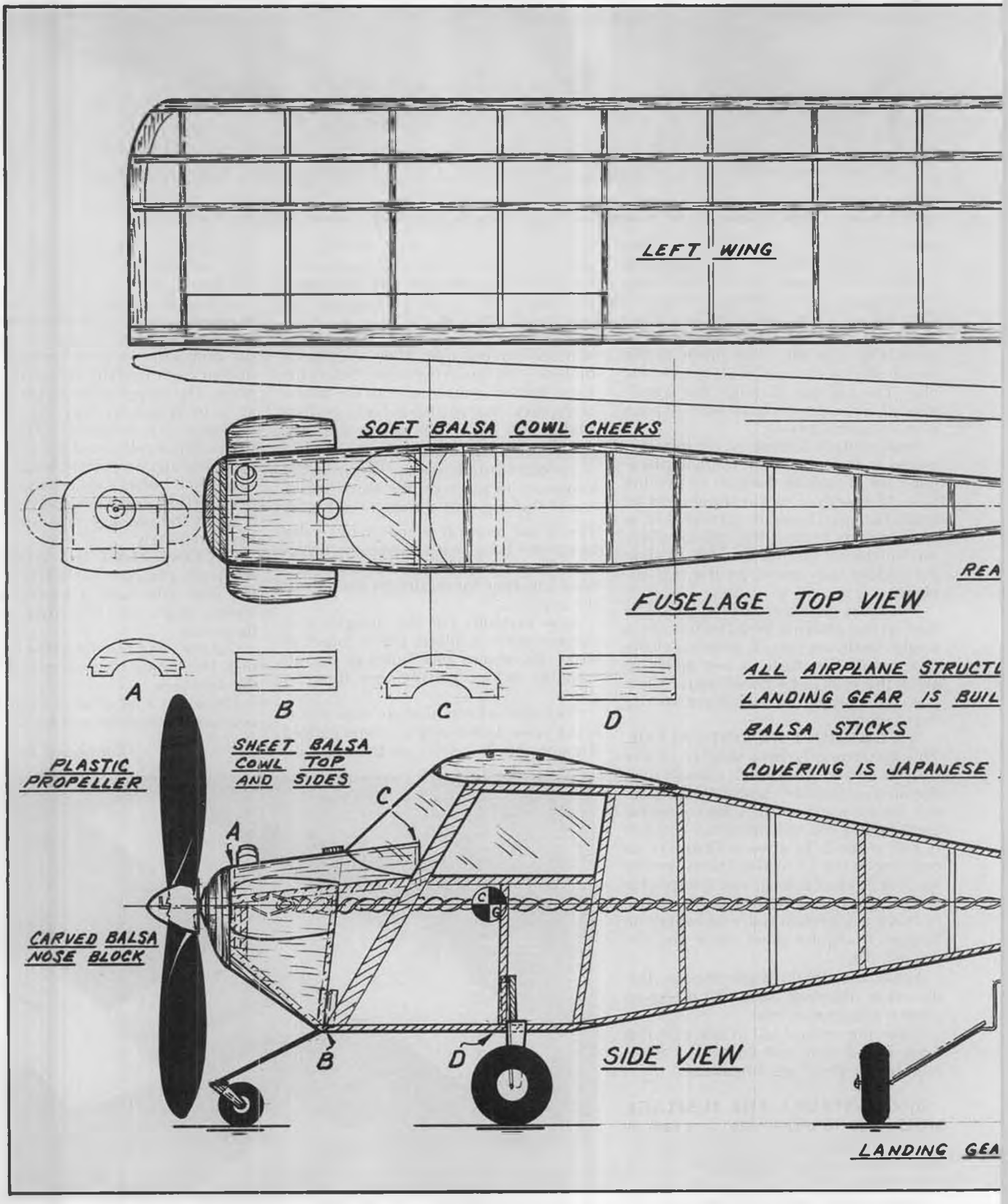
Cut the wing ribs out of the 1/16 sheet first. The typical rib pattern is shown on the side view.

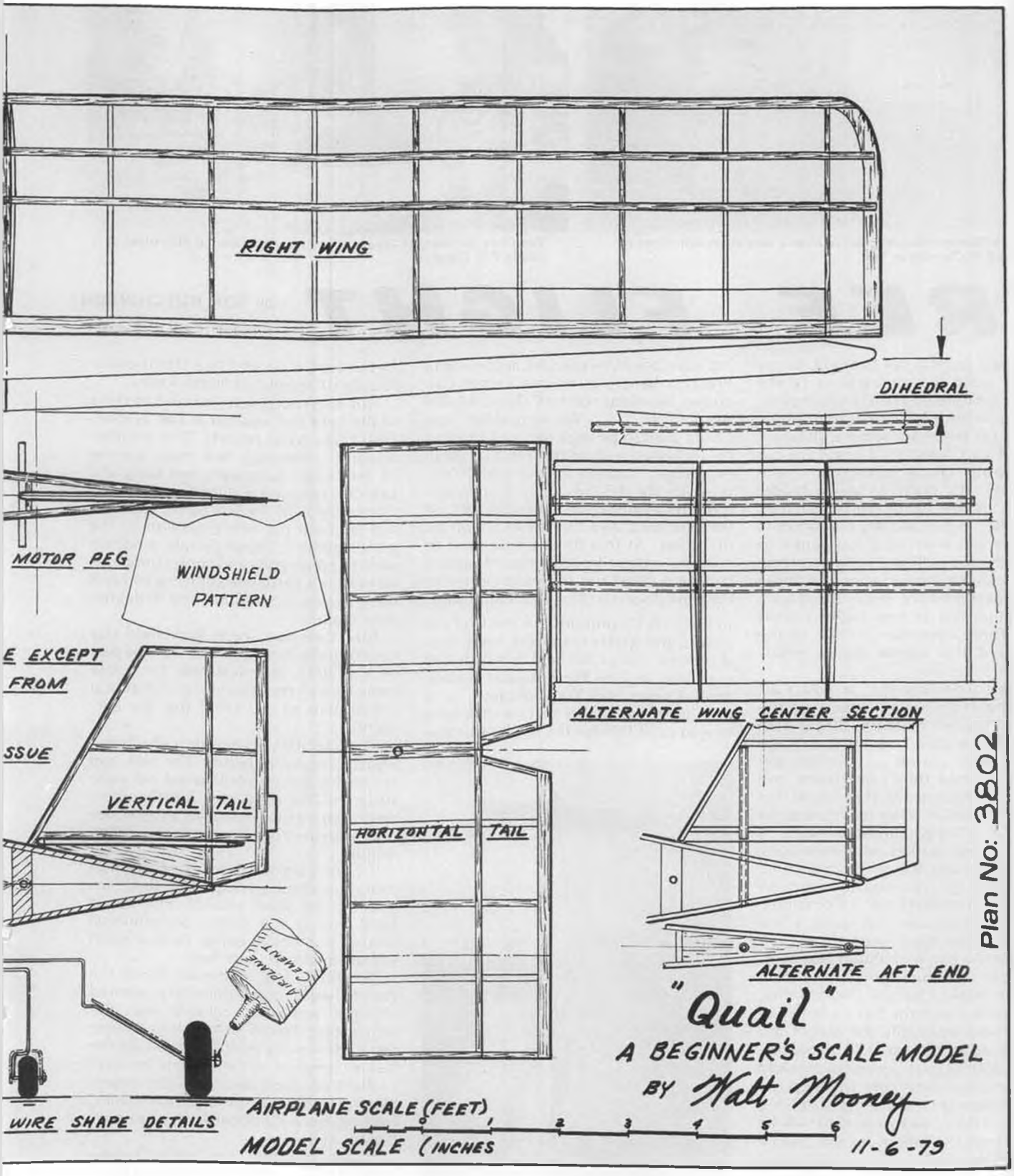
There are a lot of ways to make ribs, and two alternatives will be discussed.

Continued on page 88



Father and son Quails. The large one is recommended for beginners because the larger wood sizes are easier to handle, and the large size also makes the big one easier to trim for flight.


LEFT WING
SOFT BALSA COWL CHEEKS
REA
FUSELAGE TOP VIEW
A
B
C
D
ALL AIRPLANE STRUCTU
LANDING GEAR IS BUIL
BALSA STICKS
COVERING IS JAPANESE
PLASTIC PROPELLER
SHEET BALSA COWL TOP AND SIDES
CARVED BALSA NOSE BLOCK
SIDE VIEW
LANDING GEA



DOUBLE–SIZE PLANS AVAILABLE – SEE PAGE 108

One of the Mexican Wakes glides in after a very short test flight at '79 World F/F Champs at Taft.

Toshihiro Sokawa, of Japan, winds his model during 4th round at World F/F Champs.

FREE FLIGHT

by TOM HUTCHINSON

PHOTOS BY AUTHOR

• The past month has brought to my mailbox quite a few reactions to the recently-completed FAI F/F Championships, from both foreign and domestic sources. Let me share some with you.

From Lars Oloffson: "I heard the sad news about Doug (Galbreath) and Zachalmel. It's crazy to use a model that's on the weight limit and which then gets lighter in hot and dry conditions. I am more sad over what happened to Doug. I think it's OK to check the engine size in team racing and speed, as these classes' performance depends 99% on the engine. But in free flight, I don't know. There, the flier is 75% of the result, and the engine means nearly nothing."

Lars also doubts the accuracy of measuring engine displacement on the field. "A Swedish team was disqualified at the WC in team racing a few years ago (for the same reason . . . oversize engine.) But when they came home and used better equipment, they found that the engine was OK. They sent the engine to Rossi and they got the same results. As a professional worker with measuring tools 10 years ago, it is nearly impossible to make that (precise measurement) on the field." The latest FAI F/F Committee newsletter mentions that quite a few oversize Rossis have been discovered (apparently a batch of about 1000 oversize engines left the factory at one time) since the World Champs. The AMA has filed a protest with the FAI on behalf of Doug, and presumably the matter will be discussed at this year's CIAM meeting in Paris. Both of the rules violations were not intentional attempts to cheat by either contestant, and it does seem a shame that their fine flying efforts will be stricken from the official record. (But I'll bet that future FAI Power teams will make sure their engine displacement is checked *before* the contest, as Mario Rocca did with his new AD .15's at Taft.)

The respectable showing in their initial appearance at a World Championships by the mainland Chinese should not have been unexpected, according to Prasanta Banerjee, writing in the *Calcuttan*, newsletter of the Calcutta Model Aero Club: " . . . We remember how China used to be regarded as a force to be reckoned with in the East European Free Flight contests of the mid 1950's, prior to the fateful 'split' that subsequently developed between the PRC on the one hand and the Soviet Union on the other. At that time, China used to give the veteran free flighters of Eastern Europe a good run for their money in the annual Socialist Bloc Championships.

In the 1956 Championships the Chinese power and glider teamsters easily outshone the rest of the field that included such stars as Emil Fresl, Rudolf Franke, Rudy Cerny, and Yuri Sokolow . . . it does seem a great pity that we shall have to wait until 1981 for the F/F battle royal between China and the Democratic People's Republic of North Korea."

Michel Ibarne of France had one of the highest climbing models in the fly-off, but a poor engine run in final round put him out of the running. French team was 1st in Power.

Not everybody was inclined to think of the field and weather at Taft as ideal. *Free Flight News* reports, "The weather was hot, unbearably hot, making some of the North Europeans feel fairly ill." Lars Oloffson said that the Swedish team named the field "hell on earth," which is not far from my wife's opinion of the place, either. (Those people who are used to green grass and cooler temperatures have a hard time adjusting to Taft's dusty brown atmosphere and 90 degree temperature.)

Tom Cashman spent Wakefield day covering the New Zealand team as part of the NFFS technical task force. He came up with these technical and tactical conclusions of the event (for the *Batsheet*):

"THE MODEL: Everything else being equal, *simpler is better*. The first and second place models used no auto surfaces. The third and fourth places were won with models using auto rudder only, operated off the prop stop . . . very simple.

"There was good thermal activity in all rounds (except perhaps the first), including the flyoff rounds. You could have won at Taft with a conventional model. But you'd better have a good still-air model in your box.

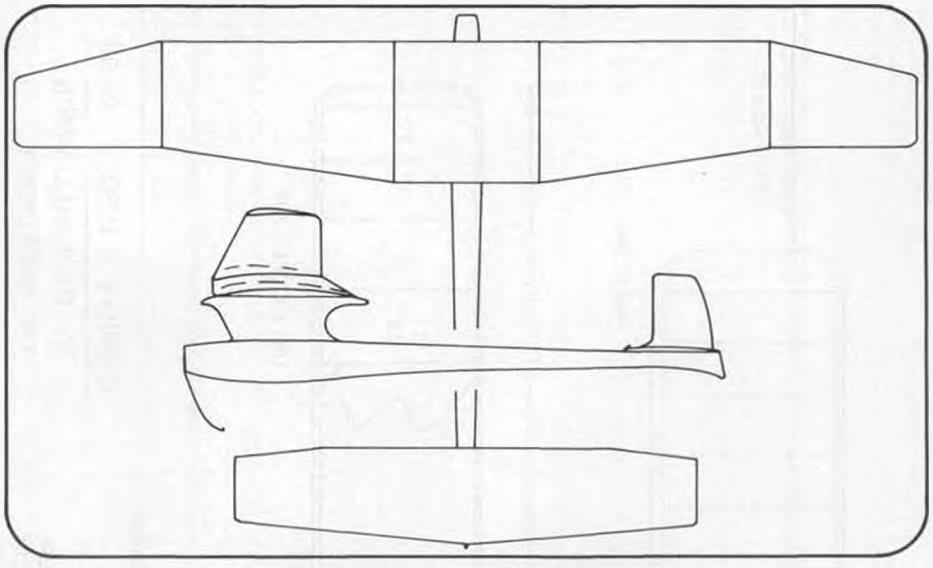
"RUBBER: The 'domestic' Pirelli the Italians were using definitely seemed stronger and more reliable than the 'imported' Pirelli other teams were using. How many motors did you see the Italians break? And they wound in direct sunlight (in direct contrast to the majority, who used a wide variety of sunshades, ranging from cardboard to patio umbrellas. TH).

"The new rubber used by the Chinese has yet to be analyzed, but it didn't seem to give that team any particular advantage. (I looked at a small sample, which seemed to have an amazing amount of stretch . . . very 'soft' stuff that was difficult to stretch to the breaking point.

It came from Shanghai, I believe. TH)

"Many teams went to FAI rubber during the heat of the day, as *their* Pirelli just wouldn't take it.

"AIR PICKING: Every conceivable air-picking device and technique was in evidence at Taft, including the use of pampas grass plumes which generate miniature fluffies when waved vigorously by nubile maidens. Their plumes were liberated from the landscape of a local motel by the team using them. (The use of cattail fluffies was also widespread, particularly by the U.S. team members. The Japanese team member registered a protest at their use after being on the downwind end of a fluffy stream for several minutes. I can't say I blamed him, since they covered people, models and rubber being wound with universal affection. TH)



MARCH MYSTERY MODEL

"The teams that picked lift most consistently, especially when the day turned windy and cooler, were those using the thermistor, in my opinion. Fluffies and streamers just don't tell you much under those conditions. The teams that picked lift most consistently were also those using a 'launch captain' who read and interpreted the air, and told the competitor when to go. Think about it. This approach allows the flier to concentrate on winding, final model alignment, preparation, and exact launch angle. This also allows one or two specialists on the team to read the thermistor (which preferably is of the recording variety), become attuned to the interval and intensity of the thermals as they develop, and observe other models reacting to identified thermals as they come through the area. This technique is probably more applicable to F1B than to F1C and least useful for F1A competition." (This is exactly the system used by the Canadian team, who were imitating the North Koreans, and it did work out better for F1B and F1C. TH)

The week after the World Champs, there was another international contest in California. Irv Aker reports (in *Bugs Buzz*): "The third Sierra Cup was held in Sacramento the weekend following the Taft World Champs. Many of the countries which were represented in the

DARNED GOOD AIRFOIL – SIMPLEX E. S. 5%

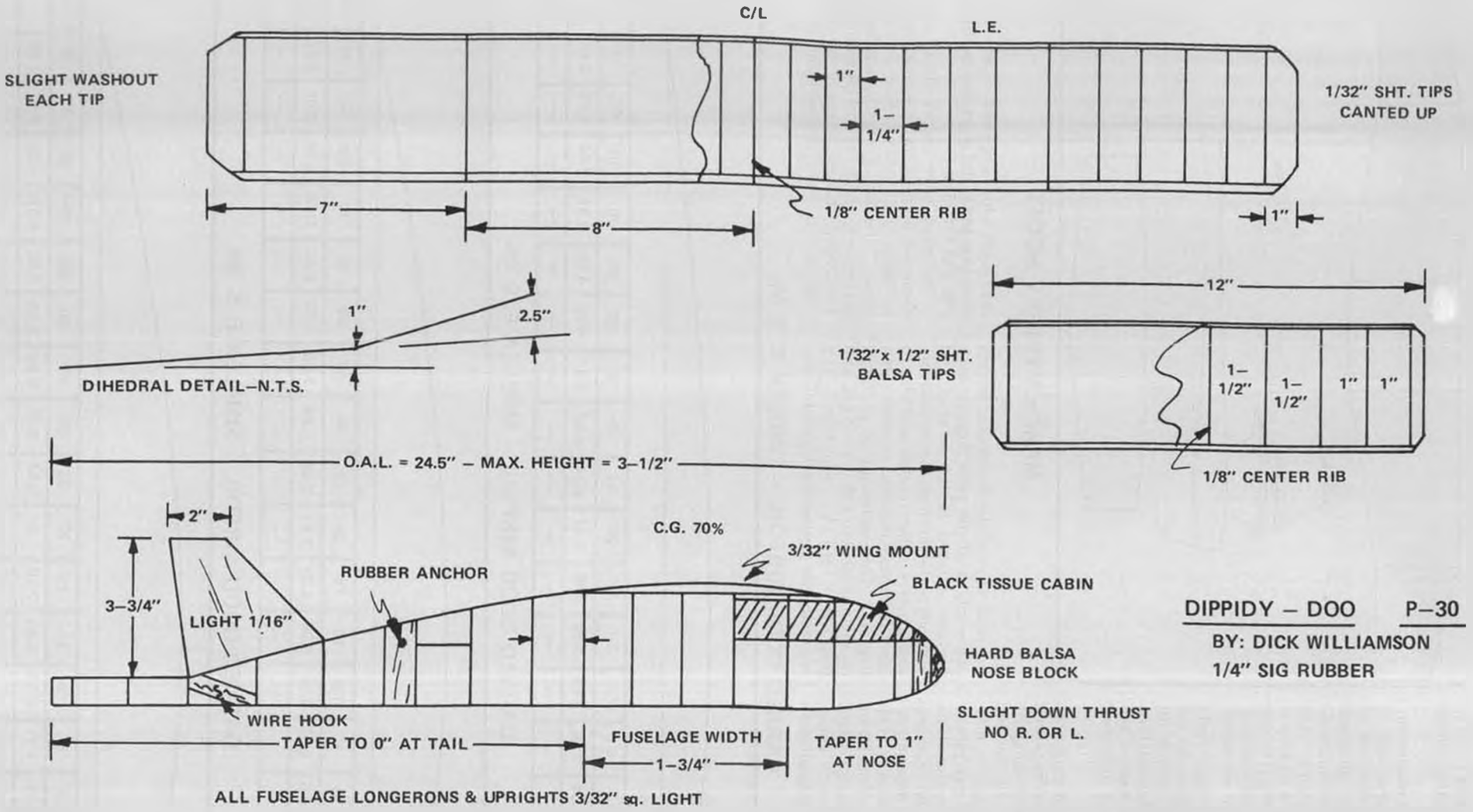
STATION	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	0	1.03	1.54	2.28	2.85	3.30	3.98	4.44	4.74	4.92	4.97	4.70	4.16	3.40	2.44	1.29	0.66	0
LOWER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

DARNED GOOD AIRFOIL – SIMPLEX E. S. 8%

STATION	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	0	1.65	2.46	3.66	4.56	5.28	6.37	7.11	7.59	7.88	7.96	7.52	6.66	5.44	3.90	2.07	1.06	0
LOWER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

DARNED GOOD AIRFOIL – SIMPLEX E. S. 9%

STATION	0	1.25	2.5	5	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
UPPER	0	1.85	2.77	4.11	5.13	5.94	7.16	8	8.54	8.86	8.95	8.46	7.50	6.12	4.39	2.33	1.20	0
LOWER	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—



DIPPIDY – DOO P–30

BY: DICK WILLIAMSON

1/4" SIG RUBBER

Swedish team manager Wengarrd launches one of their Nordics at World Champs. Swedish flier placed 2nd in Nordic.

"A one and a two . ." Like orchestra leader, Peter Allnut watches models for thermal indications before signalling to start engine.

World Champs came to Sacramento to compete (15 countries in all).

"Weather threatened to make the contest a shambles with rain and wind. The actual contest days turned out to be beautiful for flying, warm with black clouds overhead each day. The drift was not as bad as anticipated. The competition was of an extremely high caliber, with each event having seven or more fliers in the flyoffs. Nordic was decided in the second flyoff round, along with Power. Wakefield was decided on the first flyoff round." Irv didn't include the scores, but Per Qvarnstrom moved up a notch from his runner-up spot in Taft to win Nordic, beating out Greg Sussex of the U.S. The Israelis took two out of the top five places. J. Petiot of France beat out Bob White in Wake. Paul Lagan of New Zealand showed his consistency by taking third (he was fourth at Taft). Roger Simpson beat out Tom Koster to take Power (Doug Galbreath, also consistent, was fourth here).

The U.S. teams didn't do as well at Taft as their supporters had hoped, except for the victory in Nordic. But I think future teams will benefit greatly from the next generation of FAI fliers who have had their enthusiasm fanned by witnessing the events at Taft. I think many spectators went away from there with the intention of participating next time. The bug has struck at least one observer already, according to Bill Booth, Sr. (in the *Fresno Model News*): "There can be little doubt that the FAI Internationals stirred things up a bit, and aimed several fliers in the FAI direction. One in particular, Bill Morgan, has become a 'Fombie' . . . that's an FAI Zombie, walking around muttering such things as 'Rossi, grams, meters, autosurfaces, rounds, special glues,' and ending each sentence with, 'at least *fuel* will be cheaper, heh, heh.' He has memorized pages 1 through 95 of the NFFS FAI Planbook, and his eyes roll around a lot." My hunch is he isn't the only one so afflicted.

MORE NEWS ABOUT THE COX .15

If *you've* caught the FAI bug, you

Continued on page 98

Peoples Republic of China made an impressive debut in World Champs competition. This is Yi Xiangming's Wakefield being readied for flight.

Harry Grogan of Orlando, Florida, with his impressive original design Nordic.

THREE (MORE) STOOGES

By AL LIDBERG . . . Winding a rubber model is always a two-person operation at best . . . unless you have a stooge handy. Here are two different ones you can build easily; the live one you can find on your own.

• Getting someone to hold a rubber-powered model while you wind it can be a simple matter . . . if the model is Peanut size. As the size of the model increases, the number of volunteers seems to decrease in proportion to the size of the model. The act of holding a model for winding can, and often does, produce holes in the tissue, shifted wing/tail/tab surfaces, and some intricate hand and footwork as the fully wound model is passed from holder to launcher, and as the DT fuse is lit. These complications can hardly be expected to improve the quality or duration of a model's flight! Also, as the model size increases, the danger of a burst motor causing damage to the model and its holder increases. While it is true that damage to the model can be prevented with the use of winding tubes and prop guards, many recent magazine articles have covered these subjects and offered practical solutions. The subject of holding models safely and securely for winding has not been adequately covered, however, and that is what we're concerned with here.

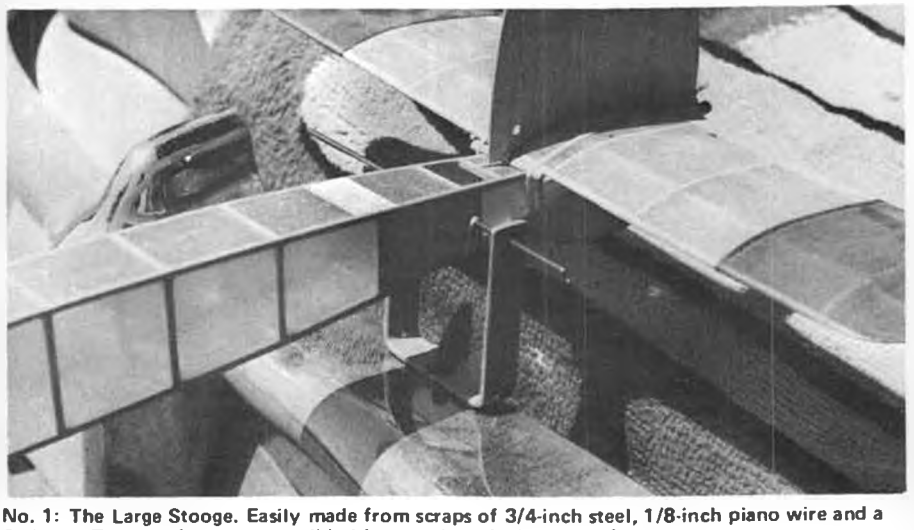
Finding someone to hold a model for numerous test flights is not always easy. A stooge (dictionary definition: one who plays a subordinate or compliant role to a principal) can solve that problem quite readily and allow you to fly a rubber-powered model by yourself, if desired. Two types are presented: one is a very sturdy bracket made of steel, suitable for large models; and the other, made of scraps of wood, aluminum, a bolt, washer, and nut, and some wood screws, is intended for Peanut and Walnut scale sized models.

LARGE MODEL STOOGE

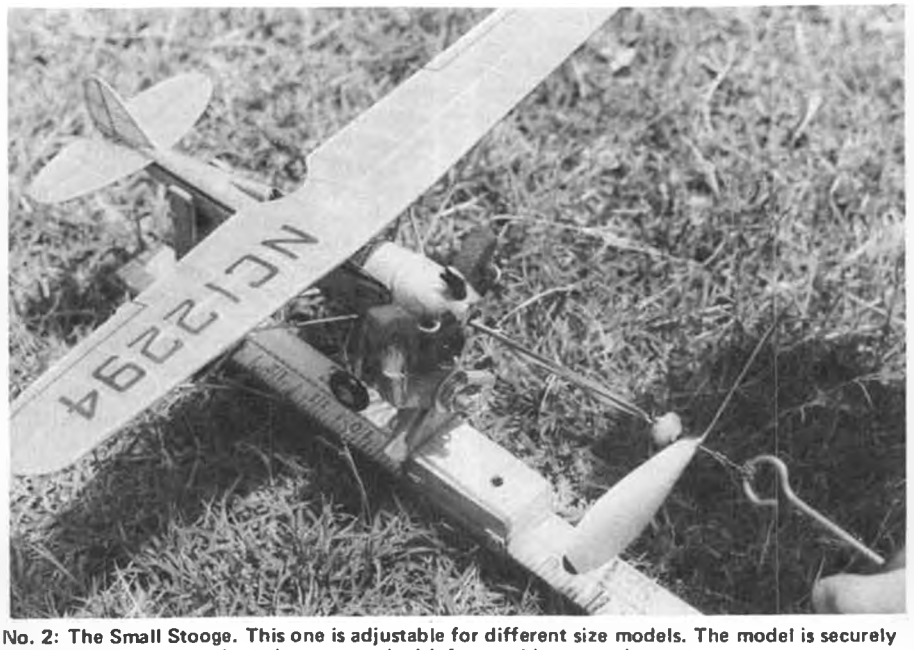
This is basically a simple-to-construct bracket which attaches to a strong point on a car. It is primarily of value for test flying, because contests (for good reasons) are arranged to require launches at some distance from the nearest car. The stooge is still useful at contests, however, if you accept the inconvenience of carrying the wound-up model to the launch site.

Bending the steel strap material is easily done with a bench vise. An extra piece of the same material can be bent lengthwise using the vise and a hammer, and then brazed or welded to the main bracket. I used one of the oxygen pellet torches, but even if you need to have the joint done commercially, it shouldn't cost more than a dollar or so. The car I take to the flying field is a '54 Chevy, which has old-fashioned bumper guards on the rear bumper. The photo shows how the stooge is built to hook on the bumper guard. A similar arrangement should be possible with almost any

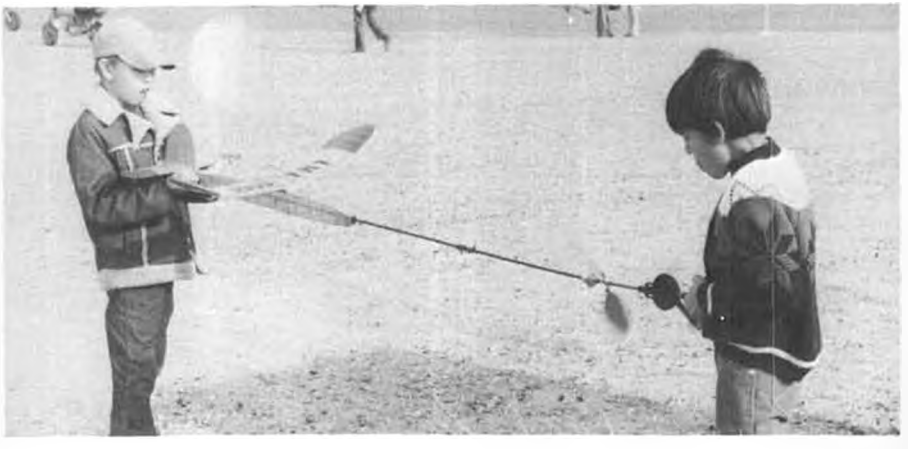
Continued on page 87



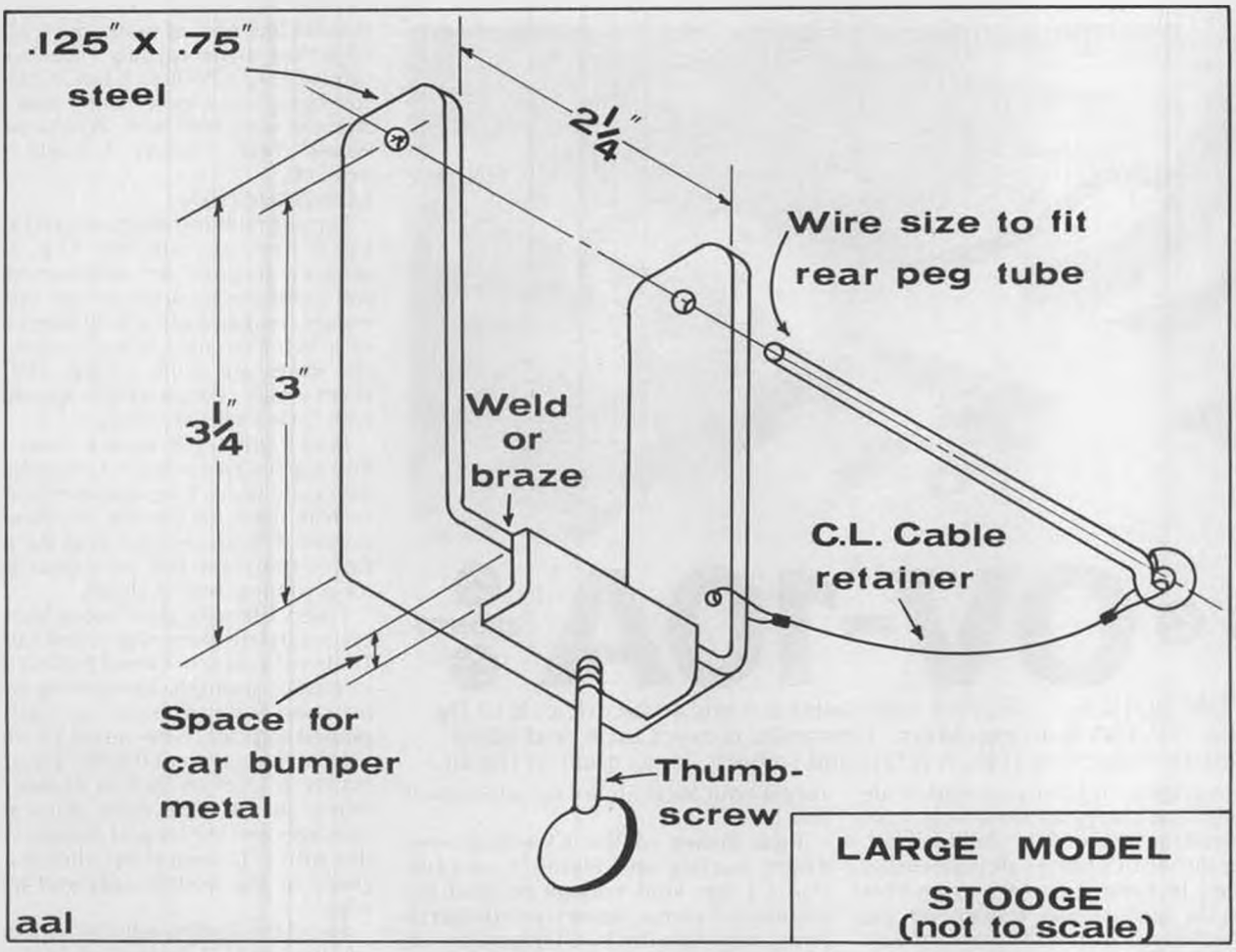
No. 1: The Large Stooge. Easily made from scraps of 3/4-inch steel, 1/8-inch piano wire and a C-clamp. This one fastens to a solid object, such as the bumper of your car.

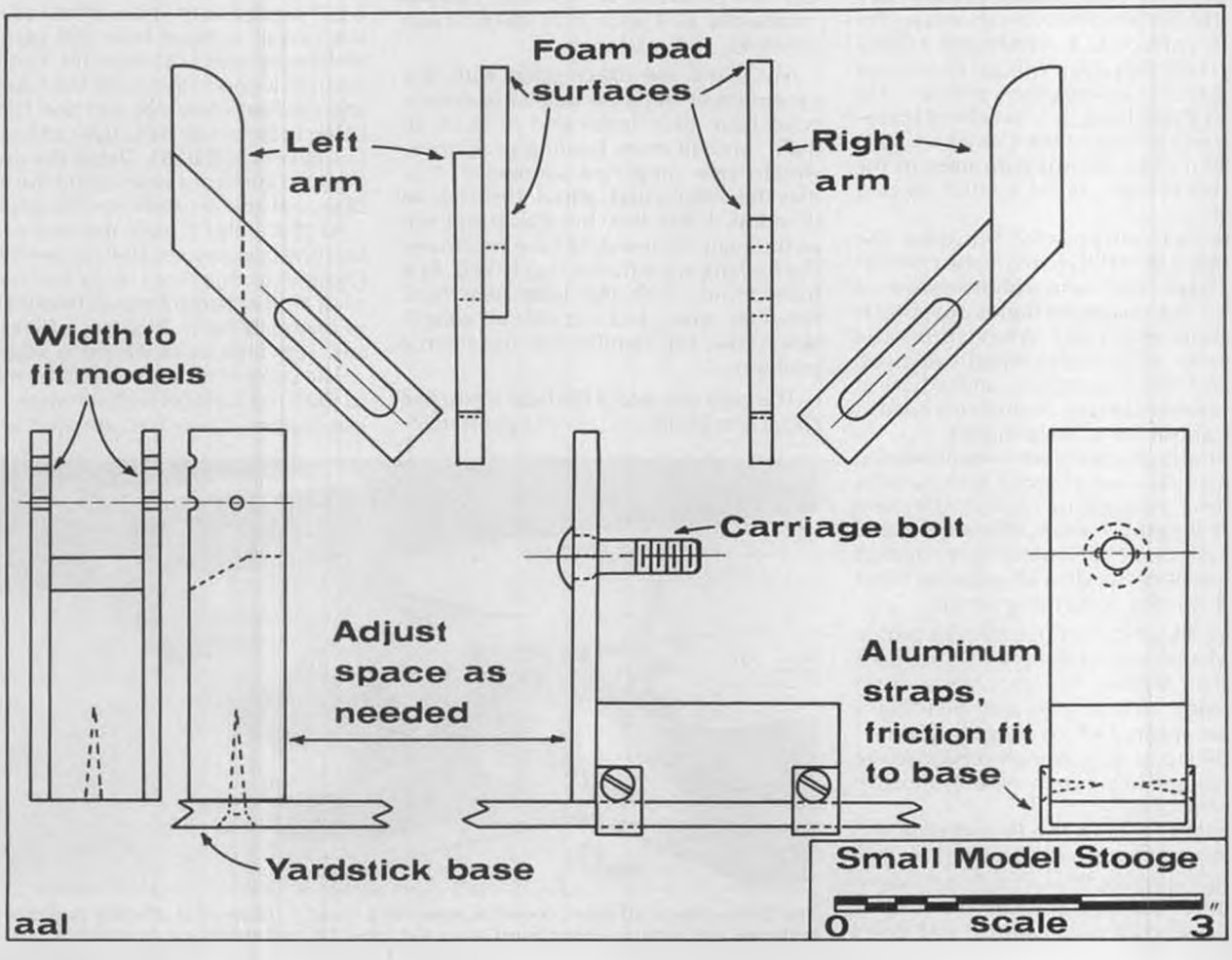


No. 2: The Small Stooge. This one is adjustable for different size models. The model is securely held at the rear peg, and gently supported with foam rubber near the nose.



No. 3: The Live Stooge. The author's son, Paul, holds while brother Mike winds. Paul will soon have more than the lollypop to worry about; look at the rubber motor . . it's coming apart!


.125" X .75"
steel
2 1/4"
Wire size to fit
rear peg tube
3"
3 1/4"
Weld
or
braze
C.L. Cable
retainer
Space for
car bumper
metal
Thumb-
screw
LARGE MODEL
STOOGE
(not to scale)
aal


Foam pad
surfaces
Left
arm
Right
arm
Width to
fit models
Carriage bolt
Adjust
space as
needed
Aluminum
straps,
friction fit
to base
Yardstick base
Small Model Stooge
0
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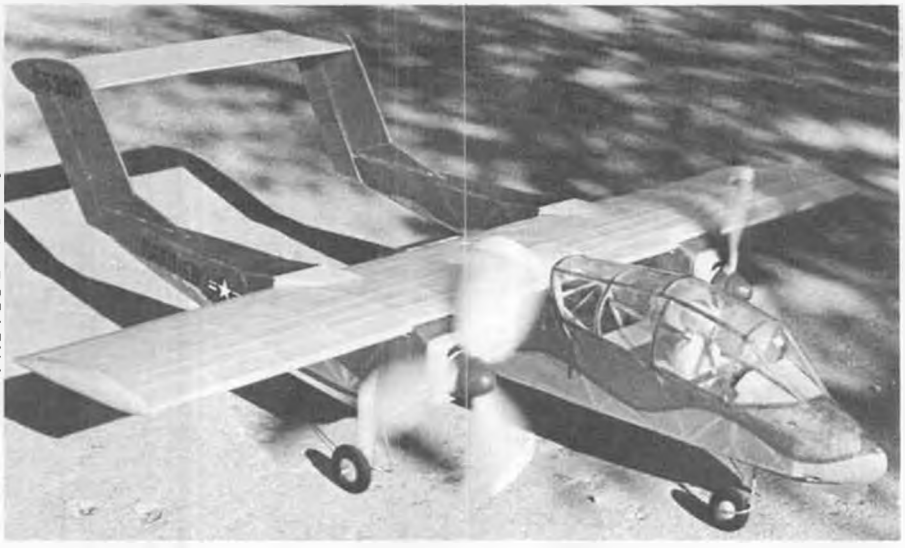


PHOTOS BY AUTHOR

OV-10A BRONCO

By TOM HOULE . . . Rubber scale twins are said to be difficult to fly, but the OV-10A is an exception. The model is exact scale, and while it's not an endurance flier, it is fast and smooth, looks great in the air.

• Twin-engine rubber-powered scale models have always fascinated me. I can still recall the Comet P-38 I built as a kid. No, it did not fly. After all that work, I decided to hang it up in a prominent place. In fact, I have researched the Comet P-38 since then and was surprised to find that it is a close copy of the P-38H. Even the fin serial number shown on the plan is correct. *U.S. ARMY AIR FORCE FIGHTERS, Part 2,* by William Green and Gordon Swanborough and published by ARCO Publishing, has excellent three-views and photos of the Comet kit. So, if you don't like the squarish lines of the OV-10A Bronco, build a much sleeker P-38H.

The real purpose of building the OV-10A was to fully explore the concept of a large size twin rubber-powered model. Are successful flights possible? Is trimming difficult? What about the power-to-weight ratio when using two motors? These questions and a host of others were dancing through my head as I cast about for a likely model.

Round-body twins were eliminated at the start. As were all twins with nacelles not long enough to contain sufficient motor lengths. I mean, this is scale, and you just don't see twin-engine aircraft with rubber extending aft of the nacelles! And I wanted something simple.

Walt Mooney had published a profile all-balsa version of the OV-10A in a back issue of *Model Airplane News.* After reviewing this article and building a Peanut version which flew fairly well, I decided to build a 36-inch version to see if increased wing area would improve performance.

I scaled up both the Peanut plan and the 36-inch span plan from *Jane's All The World's Aircraft, 1975-76 Edition.* There are other scale references available in various aircraft publications, and don't forget your local library for a history of this bird.

Russ Brown of the Cleveland Free Flight Society and Flying Aces Club (F.A.C.) was kind enough to send me copies of some out-of-print North American (now Rockwell International) OV-10A promotional material. This was invaluable as a source of detail, color schemes, and markings.

My plans are exact scale with the exception of stabilizer and wing airfoils, nose gear strut (extended 5/16 of an inch), and all three landing gear struts, which were simplified somewhat. You may be concerned about the lack of dihedral. I was too, but could not see putting any in. It would have destroyed the hulking appearance that I liked. As it turned out, with the long gear legs, shoulder wing, and virtually all weight down low, roll stability has not been a problem.

The only way you'll find out if you like twins is to build one. So let's get started. It looks like a lot of work, but it all goes together quite rapidly. That's why I selected the OV-10A. It has rectangular fuselages, rectangular center pod, and a straight wing planform. What could be easier? Yeah, I know. A single motor project!

CONSTRUCTION

Starting with the wings, which I always build first, cut out the ribs. As we progress through the building notes, I will point out areas where you can save weight. I suggest using 1/20 sheet in lieu of 1/16 for the ribs. As built and tissued, the wings are quite strong. The 1/20 sheet would reduce weight appreciably with little effect on strength.

Select your 1/8 square main spars looking for two matched, straight, and firm grain sticks. Likewise select the 1/20 or 1/16 sheet for the ribs. Pin down the bottom 1/8 square spar over the plans. Cover the plans first with clear plastic food wrap or waxed paper.

I used Titebond glue throughout. The cyanoacrylate glues might work but with Titebond you don't need perfect joints to ensure strength. The trailing edge is notched for additional strength and pinned in place. Now install all ribs.

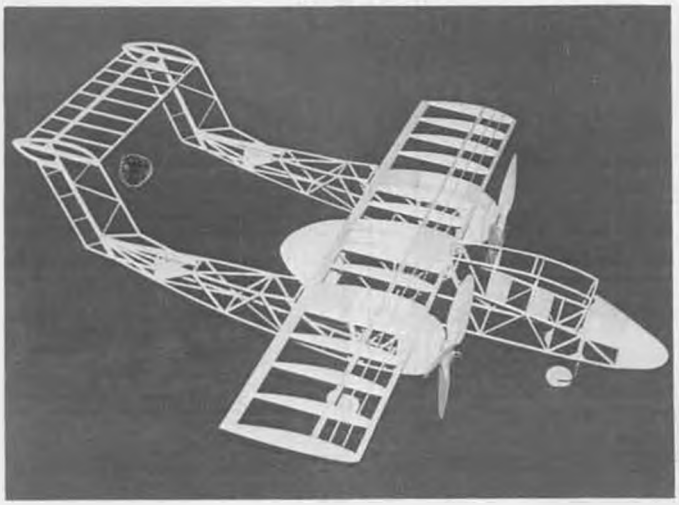
Note that seven of the ribs are undercut by 1/32 of an inch to enable flush fitting of the 1/32 sheet skins at the fuselages and center pod. Support these ribs with 1/32 sheet scrap when they are glued to the bottom spar and trailing edge.

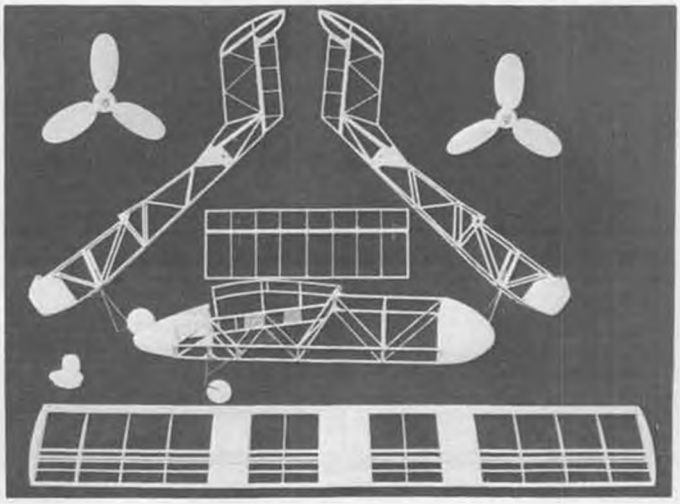
Install the leading edge, top spars, and add the top 1/32 sheet all while the wing is still pinned to the plan. When all joints are cured, remove from the plan and add the bottom 1/32 sheet fill. This sheet ensures a good joint with the fuselages and the foam fuselage and pod fairings. Either foam or soft balsa tips can be used. I used very soft balsa. Shape the tips per the plan and front views. Sand the entire structure and set aside for the moment.

At this point I built the two vertical and one horizontal stabilizer assemblies. I hinged both, since I really had no idea what kind of control inputs I would need to maintain flight. Besides, it looks nice and very little extra weight is added.

The control surfaces should be hinged to the fixed surfaces with soft wire. If you use copper, it may fracture after several

The Bronco has an efficient, powerful, mean look about it. Absence of dihedral may raise some eyebrows, but with counterrotating props and a low CG, roll stability is no problem.





Shots of the assembled and disassembled, uncovered framework. It's simpler than it might look at first. Rudders and elevator are hinged for flight trimming, and the author recommends building movable ailerons into the wing. Finished model is a one-piece structure.

adjustments. I used stainless steel safety wire, but any zinc-coated steel wire should work. The control surfaces are scale. Don't worry about their size. They are large but definitely not sensitive.

Mark the location of the horizontal stabilizer on the vertical stabilizer mount. It is important that the horizontal stabilizer incidence be as shown. That way you will not have to bend the elevator up or down. Somehow I managed to get the horizontal stabilizer incidence about right when still on the drawing board. That doesn't happen too often, folks!

In order to save some additional weight you could use 3/32 squares and 1/16x3/32 strip to build the vertical stabs. However, since they do support the horizontal stabilizer I opted for the 1/8 thickness and a slight weight penalty. Sand after all joints are thoroughly dry and set aside for tissue covering later.

Since the center cockpit pod is the most difficult to build of the two fuselage configurations, I built it first. Again, you could use 3/32 squares and 1/16x 3/32 uprights, diagonals, and crosspieces if you like. Just be sure you add a few 3/32 sheet gussets to brace the 1/32 plywood nose gear mount.

You can build the nose gear strut as elaborately as you wish. I used plain wire and duplicated only the basic assembly. The forward and aft blocks are foam obtained from the craft section of the local hobby shop. Cut the blocks to match both the side and plan views. Then gently shape to rough final form with a very sharp hobby knife or single-edge razor blade. A dull blade will gouge rather than shave. The idea is to slice thin pieces off the block. Final sand to a smooth contour with 320 sandpaper.

The blocks should be glued to the fuselage structure before final shaping and sanding. The effect is quite nice once the blocks are in place. Note that the front block goes up and over the front of the pod and becomes the instrument panel and upper nose cowl. A lightweight Bristol or card instrument glare hood should be glued over the foam.

Building the primary structure is super simple. Build the two sides on the plan, remove, and assemble upright with the two sides pinned over the plan view. Use a balsa wheel for the nose gear, either commercially available (Old Timer Models of Milwaukee has them) or "roll your own" from several cross-grain laminations. In either case, be sure to bush the wheel with a 3/32 O.D. brass tube to ensure smo-o-o-o-th ROG takeoffs.

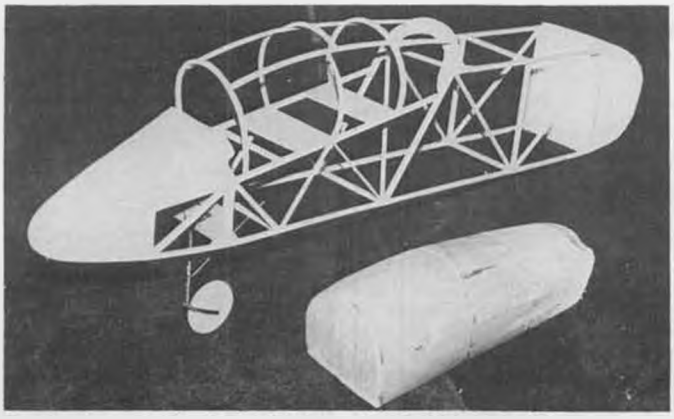
The nose strut was extended 5/16 of an inch to raise the leading edge to an acceptable angle of attack when resting on the ground. Otherwise, I doubt if it would ROG. If the scale strut length is used, you'll have to make such a gross wing incidence deviation that it would definitely be unsightly. Anyway, the lengthened strut is not really apparent. Do it and enjoy an ROG or two.

Make up canopy formers A-C and the two lengthwise canopy support rails. These are molded from four strips of 1/32x1/8 around corrugated cardboard or 1/8 balsa forms. Let them dry overnight or bake for an hour in a 250° oven.

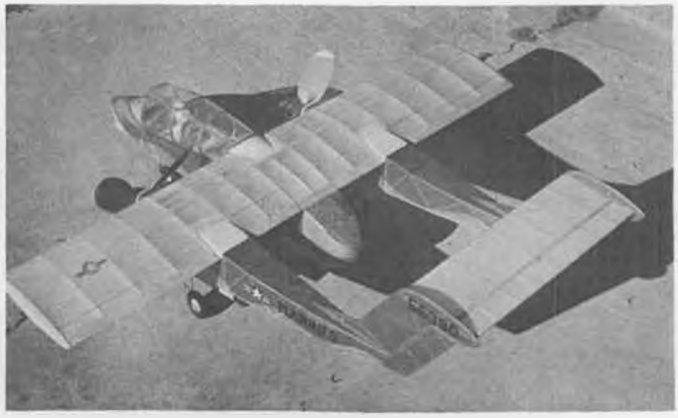
The canopy structure is what sets off the OV-10A, so take your time and do it right. Once the canopy frames are complete it is time to make a solid balsa canopy mold. You cannot flat-form this canopy because, except for the windshield, it is one continuous compound curve. The front and plan views show this.

I built a complete balsa dummy canopy from the windshield aft using 1/8 sheet as a base and 1/8 sheet bulkheads glued to it in the same locations as the molded canopy frames. Once these bulkheads are glued to the 1/8 sheet base at the correct angles, you can fill in the areas between the bulkheads with 1/2-inch thick blocks. To duplicate the molded canopy frames, place the molded frames on a sheet of 1/8 balsa and trace the outer profile onto the sheet. The balsa bulkheads must match

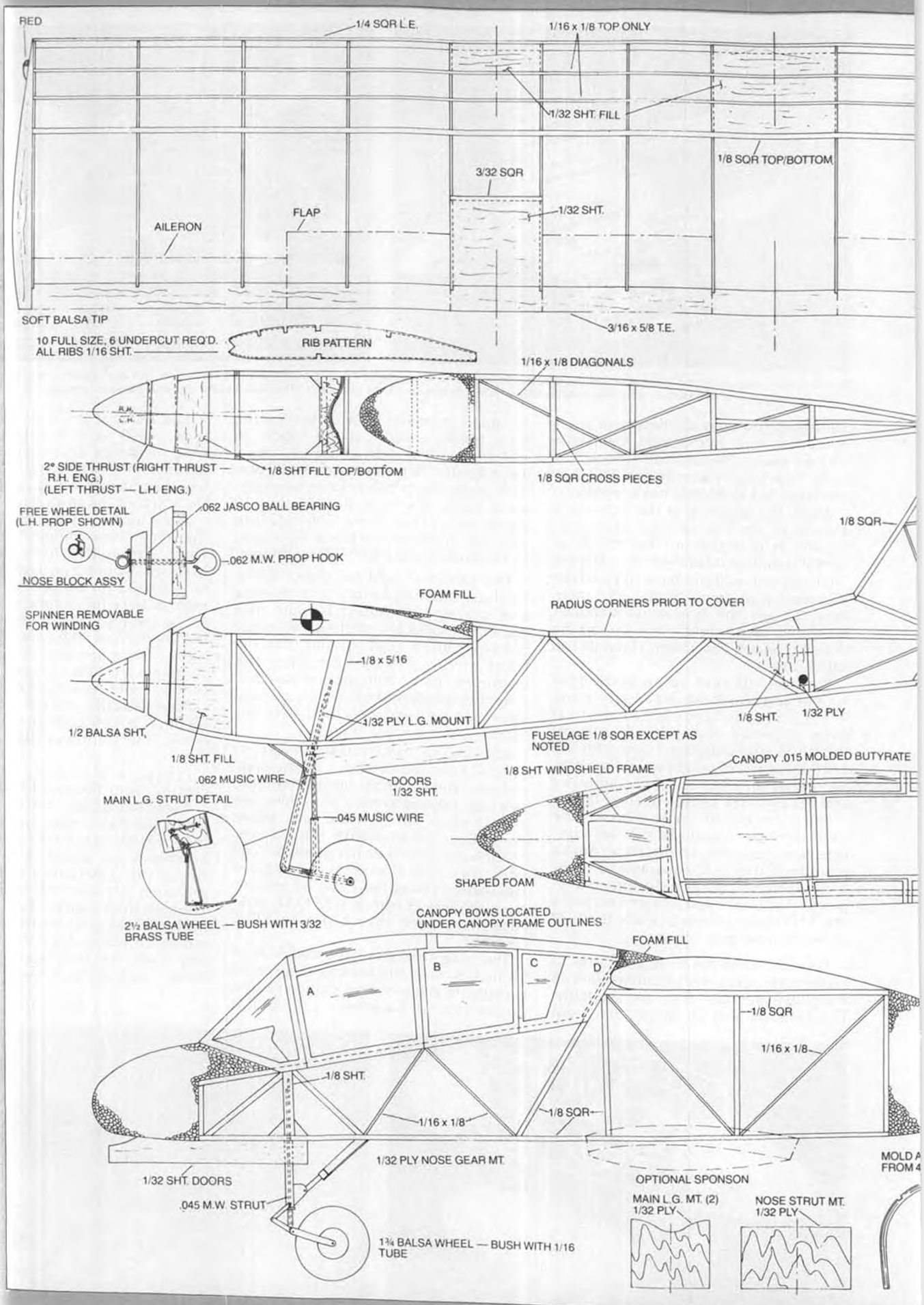
Continued on page 80

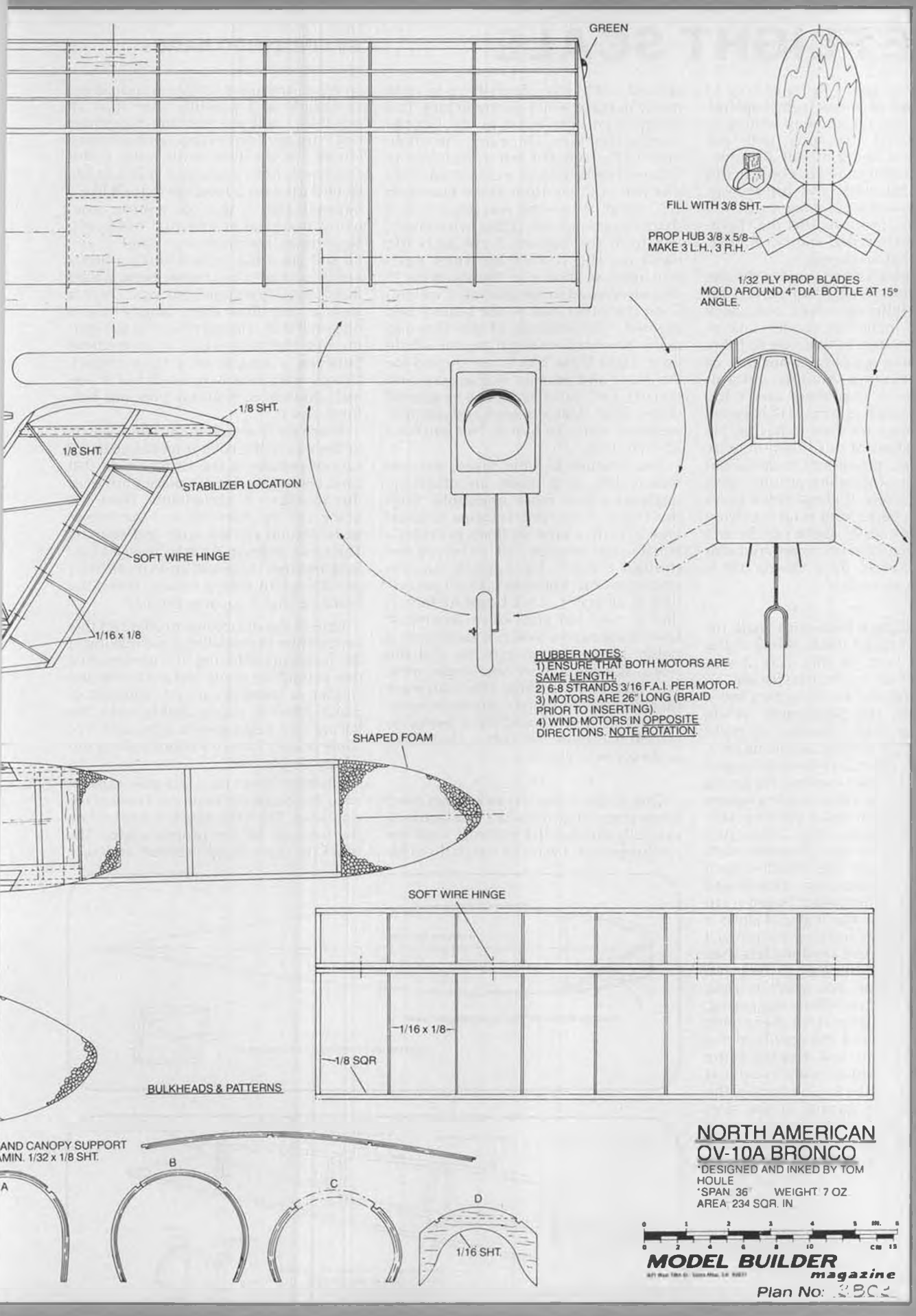


The plastic canopy is the hardest part to make. Plastic is hot-water-molded around form, text has full details.



The author's model is finished in green/white/gray Marine colors. All-gray Air Force version would also be authentic.


RED
1/4 SQR L.E.
1/16 x 1/8 TOP ONLY
1/32 SHT. FILL
1/8 SQR TOP/BOTTOM
3/32 SQR
1/32 SHT.
FLAP
AILERON
SOFT BALSA TIP
3/16 x 5/8 T.E.
10 FULL SIZE, 6 UNDERCUT REQ'D.
ALL RIBS 1/16 SHT.
RIB PATTERN
1/16 x 1/8 DIAGONALS
2° SIDE THRUST (RIGHT THRUST — R.H. ENG.)
(LEFT THRUST — L.H. ENG.)
1/8 SHT FILL TOP/BOTTOM
1/8 SQR CROSS PIECES
FREE WHEEL DETAIL
(L.H. PROP SHOWN)
.062 JASCO BALL BEARING
.062 M.W. PROP HOOK
NOSE BLOCK ASSY
1/8 SQR
FOAM FILL
RADIUS CORNERS PRIOR TO COVER
SPINNER REMOVABLE FOR WINDING
1/8 x 5/16
1/32 PLY L.G. MOUNT
1/8 SHT.
1/32 PLY
1/2 BALSA SHT.
1/8 SHT. FILL
FUSELAGE 1/8 SQR EXCEPT AS NOTED
.062 MUSIC WIRE
DOORS 1/32 SHT.
MAIN L.G. STRUT DETAIL
.045 MUSIC WIRE
1/8 SHT WINDSHIELD FRAME
CANOPY .015 MOLDED BUTYRATE
SHAPED FOAM
2½ BALSA WHEEL — BUSH WITH 3/32 BRASS TUBE
CANOPY BOWS LOCATED UNDER CANOPY FRAME OUTLINES
FOAM FILL
A
B
C
D
1/8 SQR
1/16 x 1/8
1/8 SHT.
1/16 x 1/8
1/8 SQR
1/32 PLY NOSE GEAR MT.
MOLD A FROM 4
1/32 SHT. DOORS
OPTIONAL SPONSON
.045 M.W. STRUT
MAIN L.G. MT. (2) 1/32 PLY
NOSE STRUT MT. 1/32 PLY
1¾ BALSA WHEEL — BUSH WITH 1/16 TUBE



FULL SIZE PLANS AVAILABLE – SEE PAGE 108

FREE FLIGHT SCALE

By FERNANDO RAMOS

• A few weeks ago, I had a chance to meet a friend of mine from England. John Coker and I have been writing to each other over the years, with our common bond being model airplanes. John had an opportunity to come to this country on business, and fortunately, part of it was in the Los Angeles area. It was also a bit of fortune that the Flightmasters had scheduled another R.O.W. contest for that weekend.

Even though it rained most of the day Saturday, Sunday was letter perfect for the contest. John was really taken back by seeing so many fine models take to the air from water. In listening to John, good modeling weather is not one of England's mainstays. Another unfortunate situation is that there aren't too many scale modelers around to have the contests that we are used to having. He was a bit envious of our situation here.

(By the way, groan and moan about the high cost of gasoline around here, but the cost there is about three times what we pay here. John is taking flying lessons at the rate of about one hour a month. The reason it isn't more frequent is that the cost to fly a Cessna 150 is about $50.00 an hour!)

* * *

While building a Blackburn Shark for the R.O.W., I saved the building of the floats until last. In this case, I was definitely not saving the best for last. To me, floats are like building two more fuselages, less the personality. While stewing as to how I wanted to build them, I came up with the following idea. I took the Blackburn 3-view and enlarged the floats to the size I needed, including the cross-sections. I then made a fixture similar to the type I use for building half-shell type fuselages, the difference being that there is a space between each station right down the middle. Each station is glued onto the base board where there is a bulkhead. I used scrap 1/4-inch balsa for the material since it gives good support and is easy to pin to. I wouldn't want to use anything less than 3/16 balsa. If you don't want to use balsa, use some clear pine. You won't be using so much that the cost will be staggering.

Using either 1/20 or 1/16 sheet (very light stock), I cut out the profile of the float using the side view drawing as the template. Both profiles were cut out at the same time. I then inserted one of the profiles onto the fixture in the slots provided by the stations and pinned it in place. Each bulkhead half was glued onto the profile (one on either side) at each bulkhead station. Care was taken so that no glue could ooze onto the bulkhead station, which in turn would permanently glue the float onto the jig. It might be a good idea to wax each station so there is no chance of this accidentally happening.

When these were dry, I then started gluing 1/16 square sticks on the top of each bulkhead, working from the center around each side. Everything is held nicely in place while on the fixture. The stringers go only as far as the bottom edge of the floats. Once dry, the whole float is lifted upward, removing from the fixture. The next step was to sheet only one half of the bottom of the float with 1/32 sheet. When this was dry, I took a sharp modeling knife (Uber, what else?), and from the bottom, I cut away the balsa on the profile between each bulkhead as shown in the illustration. This eliminated some unwanted weight. Then the other half of the bottom was sheeted. The addition of this sheeting really provided strength to the whole float. Light balsa blocks were used for the front and rear (or is that bow and stern?) and sanded to the required shape. Each float, covered and painted, weighed under an ounce. Not bad for a 22-inch float.

The amount of time saved was immeasurable, and made an otherwise unpleasant task more enjoyable. With the Flying Aces rules favoring unusual type aircraft, a bipe on floats provides a substantial number of points. Even though I didn't have much success getting my Blackburn to take off successfully from water, it is a beautiful flier. (I flew it over tall grass once arriving at Lake Elsinore. Naturally, it landed on a rather bare hunk of ground, and the floats, dangling at an odd angle, were knocked off on landing. The floats were quickly glued into place, but were never aligned as they should have been, so takeoff was quite difficult . . . but there is always next year!)

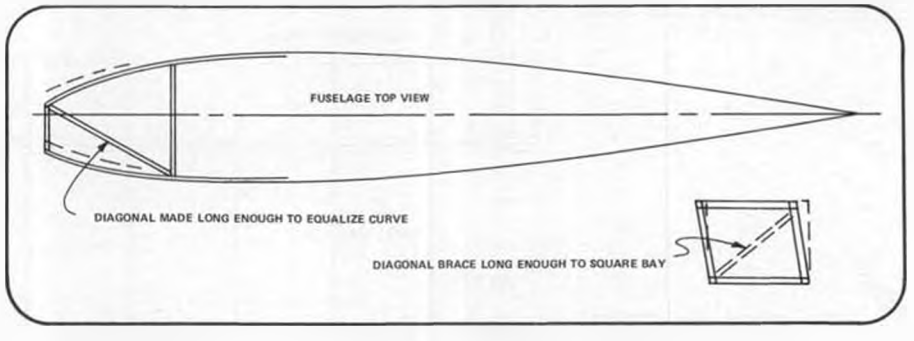
* * *

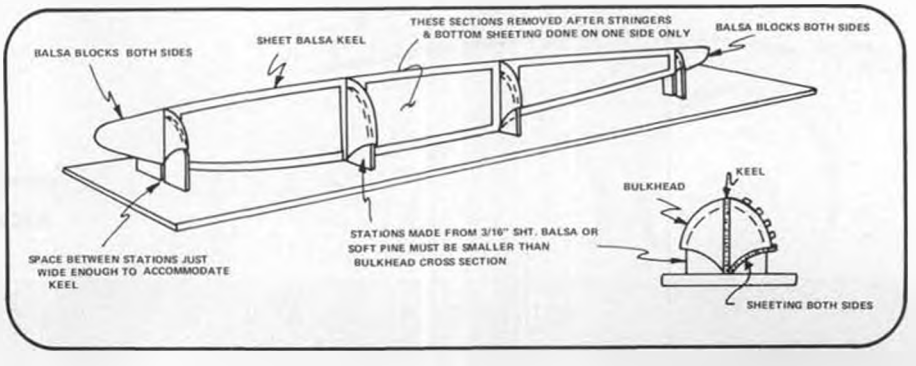
One of the items I try to keep in mind while preparing to build a fuselage is to carefully choose the material used for the longerons. I want to match them for an equal amount of stiffness and weight as closely as I possibly can. If at all possible, I will use the same length for both upper longerons, and another length for the two lower ones. If this practice is not considered, it is possible to end up with a fuselage shaped like a banana! This is due, of course, from using material of unequal hardness. Sometimes, no matter how careful I am, I'll still get a bay or two looking pretty much out of alignment. Now what? Build another frame? No way! Take a look at the illustration. Simply take a diagonal that is long enough to straighten out the bay when it is wedged between a couple of cross-members. Usually only one is needed, but if you feel another is required (top and bottom), use it.

There are times when the brace will be in the way of the rubber motor, so that it cannot remain in the structure. In that case, leave it wedged in place until all of the structure is completed. Then the brace can be removed and the framework should remain true and straight. This same technique can be used if a bay, looking from the front, looks more like a parallelogram than a square. Insert the brace so that it squares the bay.

One of the occasional drudgeries that I encounter in modeling is the making of the fuselage tail fairing. It is obvious that this should be made before either the rudder or stabilizer are permanently in place. Most of you probably make this fairing and never give it a thought. For some reason, I find it a chore making this rather simple part.

The first thing I do is tack glue a spacer onto the block the same thickness of the stabilizer. Then the block is marked on the fuselage for the proper angles. The block is then rough carved and tack





glued onto the fuselage. I feel that this is an important step, because you don't want to remove most of the material while on the fuselage. This part of the fuselage is rather fragile, and the more whittling and sanding you do the more chance you take in destroying some of the structure. The whole thing is sanded carefully until the correct contours are obtained. You must be careful to leave enough flat surface for the bottom of the fin to attach to, and make sure that this surface is straight. Otherwise you could end up with the fin offset quite a bit.

Remove the block from the fuselage, then the spacer from the block. Place the stabilizer on the fuselage, then the tail fairing on the stabilizer. Check to see that the block still fairs as it should, and if it doesn't, make it fit. Simple enough, I wonder why I make a job out of it?

* * *

The other day I received from **RCMB** an item to try out (the first time in years!). This is Carl Golberg Models' new product, called " Super Jet." It is termed a revolutionary new instant glue.

This isn't the typical cyanoacrylate instant glue that most of us are familiar with under the various trade names, because unlike the others, this one has "body". This "body" makes it possible to laminate sheets and blocks, because the glue is not quickly absorbed into the wood like the watery types of instant glues. I found that there is adequate time after spreading the glue around to align sheeting or blocks. However, once you have pressed the two together, forget it; they are there to stay! It can also be used like conventional glue, that is, place some of the Super Jet on either end of a stick, put it into place and it's there forever. Parts do not have to fit perfectly, either. I was truly impressed by this new product.

Surprisingly, there is not as much tendency for the teflon tubing to get plugged up. For one thing, the tube appears to be a bit larger than some of the other brands. I might add that I have been using Goldberg's regular Jet instant glue with very good results. This, coupled with the wood primer I mentioned before, is making the gluing process quick and strong!

* * *

Everytime I cover a model, I try different things in order to try and achieve a near perfect covering job. There is nothing like practice to help this cause along, but a few hints might help. Over the past, I have mentioned my method for covering models. The more I do it, the better I get, and the easier it becomes, but I still have a long way to go.

While covering Flyline's Kinner Sportster, I tried something that worked out rather nicely. I'll pass it on for whatever it is worth. The fuselage turtle deck has a compound curve, and with tissue, this means that several pieces of tissue have to be used. This becomes a real chore when so many strips of tissue have to be used to cover a small area. One solution to this that I have talked about before is to lay an oversize strip of tissue over the area to be covered with white glue. When the glue dries, the tissue is carefully torn at the glue joint. Since the span or grain of the paper runs the length, it is an easy job to tear along the seam and get a pretty good edge. This system has worked OK, but sometimes the tissue doesn't always want to tear on the seam. Add to this the fact that the tissue has to be applied dry, and there invariably is an unwanted wrinkle or two!

So . . . this is my latest approach. The first tissue to be applied is the easiest, since trimming is no problem. Spread the thinned-out white glue on the area to be covered, then wet the tissue and apply. When this has dried, trim the edges and give this covered bay a coat of thinned dope. When the dope has dried, take a length of drafting tape (low-stick tape) and place on the tissue just above the stringer where you want the next strip of tissue to attach. Another strip of tissue is cut for the next bay, and the white glue applied. When covering the Kinner, I was careful not to get much of the glue onto the tape, but just on the stringer. The next strip was also applied wet, stretched and smoothed out. When dry, this too was given a coat of dope, making certain that I applied some on the tissue immediately over the tape (part of the excess tissue). When this was dry, I took a sharp razor and made a slit on the tissue right where the edge of the tape was. This was done so that I could pull the tape back on itself just like you would after painting a stripe. As I pulled back on the tape, the tissue was tearing with a very neat straight edge, I couldn't believe it, it was working! Needless to say, I tried this out on the rest of the compound curves of the fuselage with equal success.

When you come around so that you will be covering a bay which already has tissue on either side of it (this would usually be the last bay to be covered), a length of tape on either side will have to be used. This technique is still a bit new and I think I will be able to improve on it, and I hope to have more on it next month. In the meantime, I hope that I have given you some food for thought.●

N.M.P.R.A. . . *Continued from page 46*

group from California, the race progressed on a smooth and even keel even under some adverse weather conditions. Once again, fellas, without you no racing is possible, and I'm sure I join all concerned in our heartfelt thanks to all of you. Also to the supporting Las Vegas Club who worked so hard in making this year's Championships a huge success.

Special thanks also must go to Mr. Bill Bennett and his entire staff for so graciously having us in their establishment for the duration of the race. Mr. Mel Larson deserves a special vote of appreciation, as it seems he couldn't do enough to help in any way that he could. Mel constantly was at the field or in communication with someone at the field to be sure all we needed was taken care of. All we can say, Mel, is thanks again for a job well done. I now see why Circus Circus is a huge success, what with a crew such as this under Mr. Bennett's leadership. This pleasing attitude also extended to the special

room rates, which I believe were more than fair considering the caliber of the accommodations and the entertainment facilities afforded us in the hotel. No championship race has ever been held in a place such as this, where there was something for everyone, not just a motel room to go back to after a day of racing. I'm sure all participants will support me by saying I hope we may sometime in the future return to Las Vegas and Circus Circus for another Championship race.

Saturday morning arrived with the room service wake-up call. Slowly crawling out of bed, I glanced out of the window at the trees below, and it was apparent that our prayers and Eric's sacrifice were not enough to stop the heavy winds. Once at the field, the situation looked bleak to say the least. Our once proud welcome sign was in tatters, much of it missing. The safety net also succumbed to the wind and flapped uselessly at the downwind portion of the airstrip. The pylons had blown over, and one portion of the Number Three pylon was found several hundred feet out in the desert. To further complicate matters, the wind was still crossed-downwind to the original course set-up, which meant changing the course 180°. This still did not allow for into-the-wind takeoffs and landings, but was better than the original. Soon pilots were called for the pilots meeting, and while the course was being changed, we were briefed on rules and operational procedures for this race. Safety precautions were at a maximum, with large protective cages at each pylon and at the timer-starter location. The distance between race course and spectator/pit location far exceeded minimum requirements.

Before calling the first heat to race, Co-Contest Director Bob Smith asked for discussion as to whether to race or not. The winds were extremely heavy and discussion among the pilots varied; many would not fly even if they decided to go ahead and race. The alternative was to cancel Saturday, and race Sunday and Monday. This suggestion was put to a vote, and the majority felt this was the best thing to do. This, of course, affected some individuals who could not afford to take the extra time off, or their airline reservations would pose a problem. Still, the spirit of competition prevailed, and even those who would leave early elected to postpone the race and at least race on Sunday before having to depart. Therefore, Saturday had an ideal ending; everyone tied for first, no aircraft lost, and no engines destroyed! Suddenly the "Big Go West" turned into the Big Blow West, or to sum it all up . . . Gone with the Wind!

Returning early to the hotel gave many time for a serious bull session in the lounge, or extra sleep for the evening's activities which included the year-end Awards Banquet to be held at the Sahara. Others found time for trying their hand at the various games of chance, with some coming out winners and others wishing we had gone ahead and raced. Saturday evening found us in one of the Sahara's elegant banquet rooms where a buffet style meal appeased all present. After all had stuffed themselves and had been entertained by K&B's John Brodbeck with his magic tricks, the 1979 High Point Champs were awarded their trophies. Topping the list as *numero uno* in the nation was Dave Shadel, who well deserved this honor. Dave attended virtually every contest in his district, and with the help of Jim Shinohara and Dave's consistent flying, wrapped it all up for 1979. Then Gary McPike was revealed as the recipient of the most outstanding aircraft award for this year's Championship Race. His flawless Lil' Toni exhibited all the fine points necessary to capture this award, and everyone in attendance heartily agreed.

Finally, talk centered around a more serious point. Bill Hager, NMPRA's President, and other NMPRA officers brought to our attention the overshadowing problem of AMA's pressure to slow down F-1 racing. This brought several responses from those in attendance, several loudly voicing their opinions ranging from the use of FAI type fuel to severing our organization from the AMA and obtaining our own insurance carrier. Other alternatives were discussed, and all the problems seemed to center around our lack of representation at AMA Executive Board Meetings. As I now understand, the AMA is satisfied with the status quo, providing we strictly adhere to the

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Sunday dawned very early for the racing fraternity, and the weather was better, but still far from ideal. The wind still remained crossed but the course had now been switched 180° to help the problem somewhat. Racing finally began at 8:30 a.m. and commentary was expertly given to spectators and fliers alike by Dr. Bob Stockwell. Bob enlightened all present with pertinent information as to each pilot's background, marital status (boy, if you could of heard some of the answers to that question!), type of aircraft, engine and radio equipment used, best time ever flown, what part of the country they were from, and total years in F-1 racing. The first few heats put several "goose eggs" on the board, some coming from erratic courses being flown, and others from ill-set needle valves. It appeared the California contingent had an edge in the proper combination of fuel, plug, and needle settings, as much of their weather synchronizes with conditions in Las Vegas. The difficulty in finding the pylons was partially compounded by the course not being parallel to the runway, and partially because there was really nothing to use as reference points.

As competition progressed, the times being turned ranged between the mid to low 1:20's, not really great considering the caliber of the participants, but again, the early round jitters combined with weather conditions and the positioning of the course may have been the reason for this. It was obvious that several aircraft had the potential to really "get it on," but widely-flown courses do not make for fast times. Round after round continued through the day with virtually every heat getting all four aircraft into the air, but then many dropping out early due to missed engine settings and several others going out due to mid-airs during competition. It looked as if a real demolition derby was shaping up. Towards the end of the day, several people still had a shot at the top hardware and no one as yet had turned a time solidly into the magic teens.

Then, late in the day Bob Ruether put it all together and ripped off a 1:16.5 to be low time candidate for the time being. As the day's competition ended, Bob Root, Ron Gilman, Gary Hovet, and Eric Myers were all tied for the first place trophy. The consistency of their aircraft along with good thumbs seemed to be their answer, not necessarily the fastest airplane! At Sunday's end everyone was ready to return to the hotel for "rest and relaxation," many having to perform those minute repair jobs we all know and love, and others to change prop, engine, or other combinations to try to put it all together for Monday's competition. Others relaxed in the lounge discussing anything but aircraft, mentioning only the "landing gears" or "spinners" on several of the cocktail waitresses. Some competitors were packing it in and getting ready for the journey home due to circumstances mentioned earlier, or simply because risking any further flying would not help them place in the standings.

Wouldn't ya know it, Monday dawns bright and beautiful with barely a breath of wind! Again, most competitors arrived at the field loaded for bear. The beautiful weather had a definite effect on flying as times began to drop, and several people started knocking on the door of Bob Ruether's fast time. Unfortunately, Bob was one who had to leave early, and could not defend this honor. Sure enough, Ron Gilman, under heavy pressure in a heat race, smoked his way to a 1:16.1 to cop fast-time honors of the meet. Racing continued at a furious pace with several of the top contenders slowly falling out during the heat of competition, but one notable trend was being broken. Several aircraft powered by K&B engines were still in contention, showing that the problems of reliability were now ironed out. Speaking with K&B's John Brodbeck, Jr., he informed me that the 6.5 engine had been completely redesigned, and now quite obviously was more than holding its own and no longer exhibited the breakage problem of its older counterpart. This type of R&D by a manufacturer is what keeps our sport competitive and deserves a tip of the hat from all of us.

The ageless Super Tigre engine, custom built by Terry Prather, also was showing its strength as it has for many years and, through Terry's efforts, has allowed even the so-called unknowns to become competitive. It seems that everyone is now consistently able to turn competitive times, and there is virtually no such thing as a "easy heat" anymore, which is what racing is all about.

By mid-afternoon, the first place contenders slowly began to emerge. First, Gary Hover of the Samurai Racing Team dropped a point, compliments of Ron Gilman, and then Eric Myers had a lean run knock him down. Still others dropped down in the standings due to cuts and other ills. This left two people tied for the first place hardware, those being Bob Root and Ron Gilman, both native Californians. Sure enough, by day's end, a fly-off would determine the winner of the 1979 Championships, as would seventh and eighth place and tenth through thirteenth place. While waiting for final tabulations on the necessary fly-offs, several notables were seen strolling through the pit area eyeing the competition. Pattern greats and successful hobby businessmen Joe Bridi and Phil Kraft stopped and talked with several competitors, as did our host, Bill Bennett. These are true gentlemen of the sport. I might add that the bull session with Joe Bridi was a continuation from Saturday night where several racers sat in the lounge, speaking with Joe, Walt Schroder, John Brodbeck, and Mort Tanner (Pica Products) during a rather enlightening and informative conversation. Amazing how these giants of the hobby industry are just simple down-to-earth model fanatics, not untouchables as some might believe.

Also roaming the pits was one Mr. Ernie Prosch with a huge folder under one arm. Who is Ernie Prosch, you ask? Well, for anyone flying a Polecat, he is the one who made this aircraft available for Formula One racing. He is the designer and builder of the full-scale Polecat, and was more than willing to speak with anyone interested in the airplane. He told the story from beginning to end, from the inception of the Polecat to its tragic ending in the nearby Mojave Desert. No, the real airplane was not unstable, actually it had the proven potential to eat up the Formula One field, but small problems negated this feat. The real Polecat was lost to pilot error, and Ernie informed me that no plans were in the future for a new bird. Such a shame for this outstanding airplane truly ahead of its time.

Ernie invited my father and me to his home at day's end, and believe me, the trip was more than worth it. He showed the plans and calculations used in the design and construction of the Polecat, as well as most of the already formed pieces of a new Polecat. He stated that these parts had been made prior to the crash, and were for another gentleman. I tried my best to place a bug in his ear to construct another Polecat, but didn't do too well as mentioned. Therefore, anyone interested in a full-scale Polecat kit can contact Ernie! By evening's end, he had shown us dozens of photos of the real airplane and moving pictures as well. This was a real experience and a highlight of the trip . . . thanks, Ernie. By the way, Ernie is a modeler, as well as a Captain for Hughes Northwest Airlines.

The fly-offs for the top twenty began with a four-plane battle for tenth place. This involved Mike Helsel, Ed Allen, Rusty Van Baren, and Harley Condra. As in any fly-off, things really start to happen and this was no exception. Right from the start, everyone is going for broke, and these four pilots gave some indication of what was to come in the yet-to-be flown duels. All four staged a close, exciting race with the finish order ending up as mentioned. For several laps, it appeared that a king-size blanket would have covered all four aircraft, which really makes for exciting racing, be it pilot or spectator. Next up to decide seventh place honors was John Jennings and Jerry Boyce. Again, a super race ensued, with Texas based Mr. Jennings emerging as the victor. Then the race which would decide the National Champion for 1979 was called to the line. Both Bob Root and Ron Gilman were ready for action with Ron holding the apparent edge with the fast time of the meet under his belt. I guess Bob and Kathy Root were saving the best for last, as Bob unloaded a 1:14.1 in the fly-off even after Ron had cut a pylon late in the race. Once again, neither pilot let up through the entire race, and they never seemed more than fifty feet apart, switching to the lead back and forth several times. A truly exciting ending to a truly exciting contest. Congratulations go to Bob and his able caller-wife Kathy (or is that wife-caller?) for a super job on both their parts, putting it all together and winning against the best in the country. They both deserve the win and the spoils that go with this prestigious accomplishment.

I think this is also a good time to point out the variety of aircraft in the top five

places, breaking another trend of one airplane dominating the racing scene. Not to take anything away from any airplane, but it's good to see that more than one type is competitive, and gives individuals several choices of obviously competitive aircraft. Bob Root flew a Stinger to top honors, while Ron Gilman chose a Denight Special to carry his banner. Third place Gary Hover flew the tried and proven Lil' Toni, as did fourth place finisher and this year's Nats winner, Bill Preis. Kent Nogy depended on a Polecat to capture fifth place hardware. Other aircraft featured at this year's Championships were the new Tom Cat, several LR1-A's, and a sprinkling of Minnows and El Banditos. Might also add that Mr. Polecat himself, Bruce Richmond, was responsible for no less than 17 entries at this year's race. After all, who else can build, paint, equip, and test fly a Formula One in one week's time!!!

Trophies presented to the top twenty racers as well as fast time and most outstanding aircraft were exceptional. A very good reason for this was due to their sponsor, Mr. Bill Bennett. Further reward was in the form of that good old green stuff, compliments of NMPRA. Aiding in the trophy presentation were Bob Smith's wife, Pam, and Chuck Smith's wife, Linda, which made receiving the awards even nicer! These women as well as Jeff Bertkins' girlfriend, Sharon, worked very hard during the entire contest keeping scores straight, tabulating final results, and generally keeping the contest bookwork in order. Thanks, ladies!!!

So it was at the 1979 NMPRA National Championships, Las Vegas, Nevada ... A SUPER MEET! •

N.M.P.R.A. '75 CHAMPIONSHIPS
TOP 20 FINISHERS

*1)	BOB ROOT	Stinger
*2)	RON GILMAN	Denight
3)	GARY HOVER	Lil' Toni
4)	BILL PREIS	Lil' Toni
5)	KENT NOGY	Polecat
6)	PETE REED	Polecat
*7)	JOHN JENNINGS	Polecat
*8)	JERRY BOYCE	Lil' Toni
9)	ED HOTELLING	Lil' Toni
*10)	MIKE HELSEL	Lil' Toni
*11)	ED ALLEN	LR1-A
*12)	RUSTY VAN BAREN	Lil' Toni
*13)	HARLEY CONDRA	LR1-A
14)	CHICK BENTZ	Minnow
15)	ERIC MYERS	Polecat
16)	TOM CHRISTOPHER	Polecat
17)	TOM CASTELLANO	Polecat
18)	GUY JOHNSON	Lil' Toni
19)	BILL HAGER	Lil' Toni
20)	BOB WALLACE	Denight

*Results determined by flyoff.
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Most Outstanding Aircraft Award —
Gary McPike,
Lil' Toni, Super Tigre Powered.

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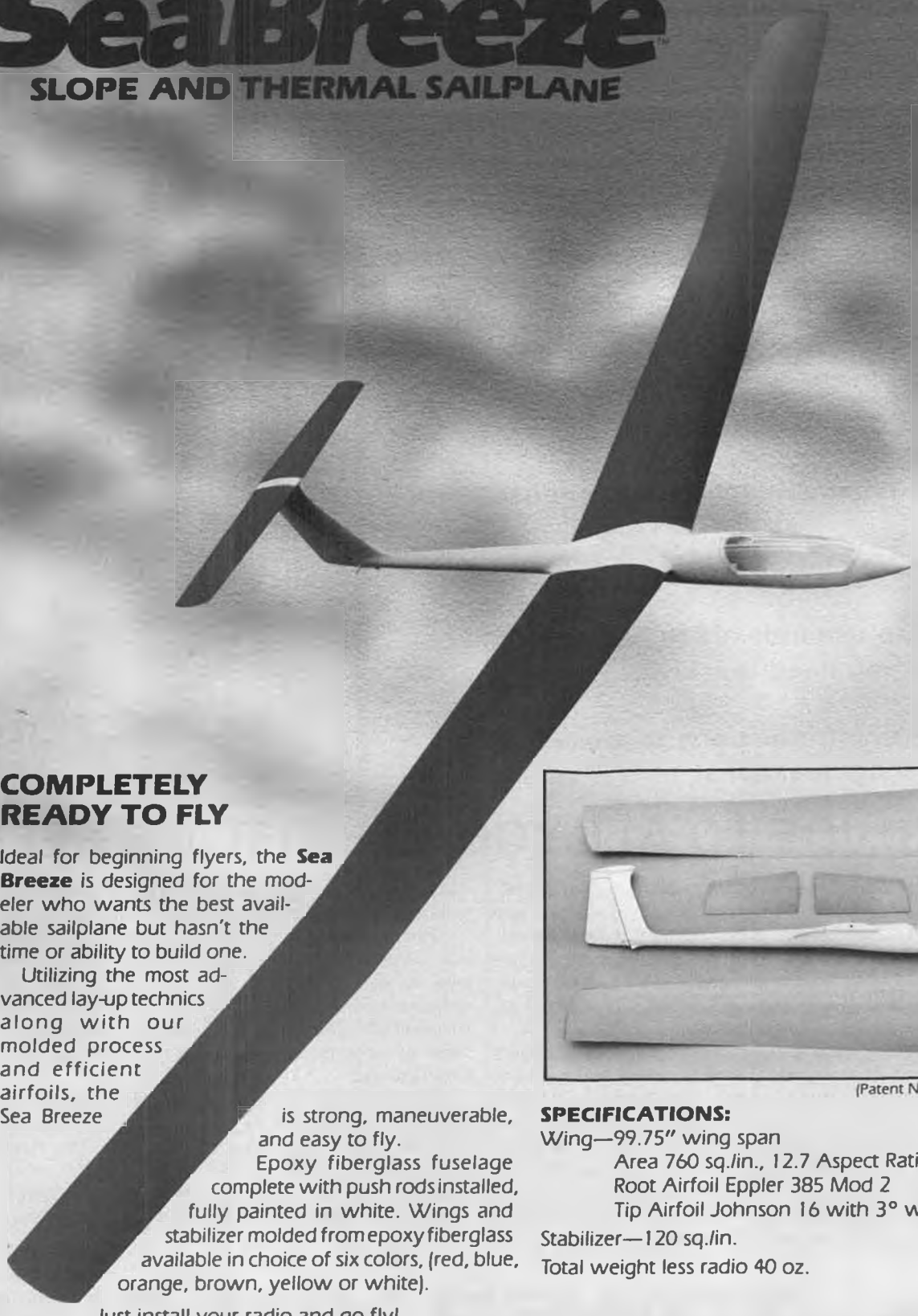

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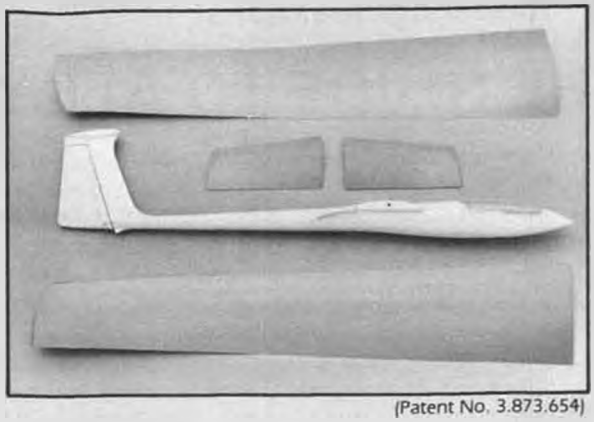

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Tip Airfoil Johnson 16 with 3° washout

Stabilizer—120 sq./in.

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We developed the actual descriptions from a modeler's point of view! We know from experience the questions you need answered in order to make that important buying decision. If after reading the descriptions, you still aren't sure of something, you can use the TOWER ACTION POST CARDS supplied inside the catalog to write directly to the manufacturer for more information. This is just another customer-oriented service you've come to expect from Tower! We've also included a revised and updated accessory completion guide in an easy to use chart format. This chart enables you to determine what accessories you will need to complete the kits listed in this catalog.

Other outstanding features of this catalog are the special section introductions that appear throughout. These introductions were written specifically to add to the general knowledge of someone new to the RC hobby. Even if you've been a Tower customer for years, we hope these introductions will answer some of your questions, provide you with helpful hints, and entertain you!

Remember, this 358 page Tower Hobbies RC Catalog was developed for you, the modeler, and contains everything you'll need to enjoy your hobby to its fullest! This Radio Control "Bible of the industry" will be included free of charge with your first merchandise order from Tower Hobbies. Or, it's available by itself for $2.50 postpaid. ORDER TODAY!

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MBM396	Bridi Deception	99.95	74.98
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MBM123	Bridi RCM Trainer 40	58.95	39.98
MBM125	Bridi Dirty Birdy 40 - wood	64.75	45.28
MBM126	Bridi RCM Trainer 60	67.95	45.98
MBM130	Bridi UFO - fiberglass	142.95	102.98
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MBM205	K&B .21 Outboard	110.00	69.98
MBM406	K&B .21 RC Schneurle w/Muffler	77.00	49.98
MBM200	K&B .40 RC Engine	72.50	46.98
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MBM421	Bud Nosen P-51 - 8.5'	169.95	119.98
MBM449	O.S. Max .15 RC w/Muffler	45.95	29.98
MBM455	O.S. Max .20 RC w/Muffler	46.95	31.98
MBM469	O.S. Max .45 FSR RC w/Muffler	119.95	83.98
MBM451	O.S. Max .90 FSR RC w/Muffler	225.00	157.48
MBM470	Peerless 1/12 Electric Porsche	110.00	49.98
MBM251	Pica Cessna 182	99.95	66.98
MBM253	Pica T-28B	89.95	59.98
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MBM415	Sig Beechcraft Bonanza	77.50	54.98
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MBM276	Sig Kadet Trainer	43.95	31.68
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MBM294	Sterling Puddle Jumper MK II	47.95	29.38
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MBM296	Sterling ½A Corsair	35.95	22.98
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MBM472	Sullivan 24 v. Electric Starter	49.95	33.48
MBM452	Supertigre X-11 RC Schneurle w/Muff	45.95	26.58
MBM307	Sureflite Skylane 182	39.95	25.98
MBM308	Sureflite All Foam J-3 Cub	39.95	25.98
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MBM390	L.R. Taylor Multi-Charger	24.95	19.98
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MBM425	Top Flite Contender 40	49.95	32.98
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MBM320	Top Flite F4U-1A Corsair	99.95	59.98
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MBM315	Top Flite Freshman Trainer	47.95	30.98
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MBM313	Top Flite Sealing Iron	19.95	13.98
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MBM323	AFI 12 v. Battery Charger	8.95	6.98
MBM325	Tower Rubber Bands ¼ lb. No. 64	1.50	.98
MBM440	Webra .91 RC Schneurle	268.35	144.98
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MBM422	MRC Lamborghini Countach Special	84.95	63.68
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MBM444	Bud Nosen Big Stick	129.95	97.48
MBM421	Bud Nosen P-51	169.95	119.98
MBM240	OPS .65 RC Marine w/Tuned Pipe	238.00	174.98
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MBM309	Sureflite ½A J-3 - foam	29.95	19.48
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6 Channel w/2 KPS-14II	Servos	$149.95	MBM397
6 Channel w/3 KPS-14II	Servos	174.95	MBM398
6 Channel w/4 KPS-14II	Servos	199.95	MBM339
6 Channel w/4 KPS-15II	Servos	209.95	MBM340
Tower KPS-14II Servo		25.00	MBM399

THIS SALE IS NOT RETROACTIVE

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KP-2AW (Wheel) w/15IIA's		145.95	98.98	MBM345
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KP-2A (2 Stick) w/15IIA's		145.95	98.98	MBM347
KP-2AS (1 Stick) w/14IIA's		139.95	94.98	MBM348
KP-3AS w/KPS-14IIA's		149.95	99.98	MBM433
KP-4A w/KPS-14IIA's		309.95	196.98	MBM350
KP-4A w/KPS-15IIA's		321.95	204.98	MBM351
KP-6A w/KPS-14IIA's		339.95	216.98	MBM352
KP-6A w/KPS-15IIA's		351.95	224.98	MBM353
KP-5C w/14II's or 15II's		389.95	259.98	MBM354
KP-5CS w/14II's or 15II's		389.95	274.98	MBM355
KP-7C w/14II's or 15II's		529.95	377.98	MBM356
KP-7CS w/14II's or 15II's		529.95	377.98	MBM357
KPS-14II Servo		44.95	32.98	MBM358
KPS-15II Servo		44.95	34.88	MBM359
KPS-18 Servo (Super Mini)		54.95	43.98	MBM360
KPS-14IIA Servo		39.95	27.98	MBM361
KPS-15IIA Servo		42.95	29.98	MBM362

FUTABA	FUTABA	FUTABA	FUTABA	FUTABA
FP-2GS	109.95	72.98	MBM363
FP-2F w/S-7's	149.95	98.98	MBM364
FP-2F w/S-18's or S-22's	134.95	89.98	MBM365
FP-2E w/S-7's	149.95	98.98	MBM366
FP-3S w/S-18's	144.95	94.98	MBM368
FP-3S w/S-20's	169.95	109.98	MBM369
FP-3FN w/S-18's or S-22's	219.95	139.98	MBM383
FP-4FN w/S-18's	289.95	179.98	MBM370
FP-4FN w/S-16's	319.95	199.98	MBM371
FP-5FN w/S-18's	319.95	204.98	MBM372
FP-5FN w/S-16's	359.95	222.98	MBM373
FP-6FN w/S-18's	339.95	209.98	MBM374
FP-6FN w/S-16's	369.95	234.98	MBM375
S-7 Servo	39.95	29.98	MBM379
S-16 Servo	39.95	29.98	MBM378
S-18 Servo	29.95	22.48	MBM377
S-20 Servo (Mini)	39.95	29.98	MBM437

MRC	MRC	MRC	MRC	MRC	MRC	MRC	MRC
No. 2000 2 Ch. w/MR-12's			99.98	72.98	MBM474
No. 4000 4 Ch. w/MR-12's			249.95	174.98	MBM475

SANWA	SANWA	SANWA	SANWA	SANWA	SANWA
No. 8020 2 Channel	99.95	69.98	MBM380

OV-10A . . . . *Continued from page 65*

the molded frames.

With the 1/2-inch balsa filler in place, you can now carve and shape the balsa to match the side, front, and plan view profiles. I made three cardboard templates to check my progress as I carved and shaped.

The idea is to produce a solid balsa replica of the canopy. Use the bulkheads as checkpoints. Carve the 1/2-inch balsa down to them but do not go any further. If you have low spots, fill them with plastic wood or some such thing. Sand smooth and apply a couple of coats of varnish. Sand some more. You *do* want a perfect canopy, don't you?

Fit your balsa canopy to the center pod and make sure that it flows into the fuselage at all points. Satisfied? Okay. We are ready to either vacuum form or hot water mold the canopy. That's right, troops. I said hot water mold a canopy.

Since I do not have vacuum form capability, I used the hot water molding process. Dave Gibson, a modeling mentor of mine from Canton, suggested I try this. He has had some experience with it and passed it on, so I am passing it on to you too.

The canopy, due to its compound curves and pinched-in width at the bottom, cannot be molded in one piece. Since there is a horizontal canopy rail on each side, it seemed logical to mold two side panels and one top panel. They are installed with an overlap at the horizontal canopy rail on each side.

A 1/2-inch sheet balsa box was built that stood three inches high and was just large enough to slip over the balsa canopy mold.

Obtain some .015 butyrate plastic from your local hobby shop. I believe Sig also sells a similar material. Both vinyl and butyrate will work with the hot water process. Acetate will not work, as it will not soften enough. I tried a .0075 thickness too, but it was not stiff enough when molded. Anything from .015 up will work.

Stretch the plastic across the open box tightly, wrap it over the sides and hold in place with rubber bands and pins. Get the plastic as tight as possible. Slit the corners so the plastic wraps around the corners.

Set a shallow pan on a burner with about 3/4 of an inch of water in the pan. Have the mold and the balsa box plus plastic ready to go nearby. When the water boils, immerse the balsa box, with the plastic down, in the water. Wait two to three seconds and pull out the box while snatching the mold with the other.

With no hesitation, place the box and plastic onto the side or top of the mold and push hard. You must mold the plastic while it is still hot and pliable. It may take two tries to get it right. Be sure you have extra plastic sheets. You could also try placing the balsa mold in the water and plunging the box over the mold while underwater. That way, you have an ongoing supply of heat. In any case, once you are satisfied that the draw is deep enough, get the plastic out of the water. The butyrate I used had a tendency to mottle and turn milky if left in the water too long.

There you have it; a simple, low cost way to obtain a compound curve. I haven't tried it with a one-piece canopy, but if it were molded underwater, I do not see why it would not work.

Vacuum forming should be done in the usual way. Make two side and and one top panel just as in the case of the hot water process. Trim the three molded sheets and fit to the canopy frames. I found cyanoacrylate glue to be perfect here as a neat, quick means of attachment. Do not worry about the overlap at the horizontal canopy rail. It will be covered up with strips of tissue which simulate the canopy frame.

Since the entire cockpit is gray, I painted the interior of the canopy frames and exposed balsa with flat gray. I also carved a styrofoam pilot. I did not add an observer, as this bird is used only for ferry flights. Hence, the sponsons were also omitted.

Install the canopy and windshield now so that the tissue covering can be brought up to and over the edges of the plastic. It makes for a neater, more prototypical installation.

Put the whole works aside and proceed to the two fuselages. Again, these are standard construction. Build four

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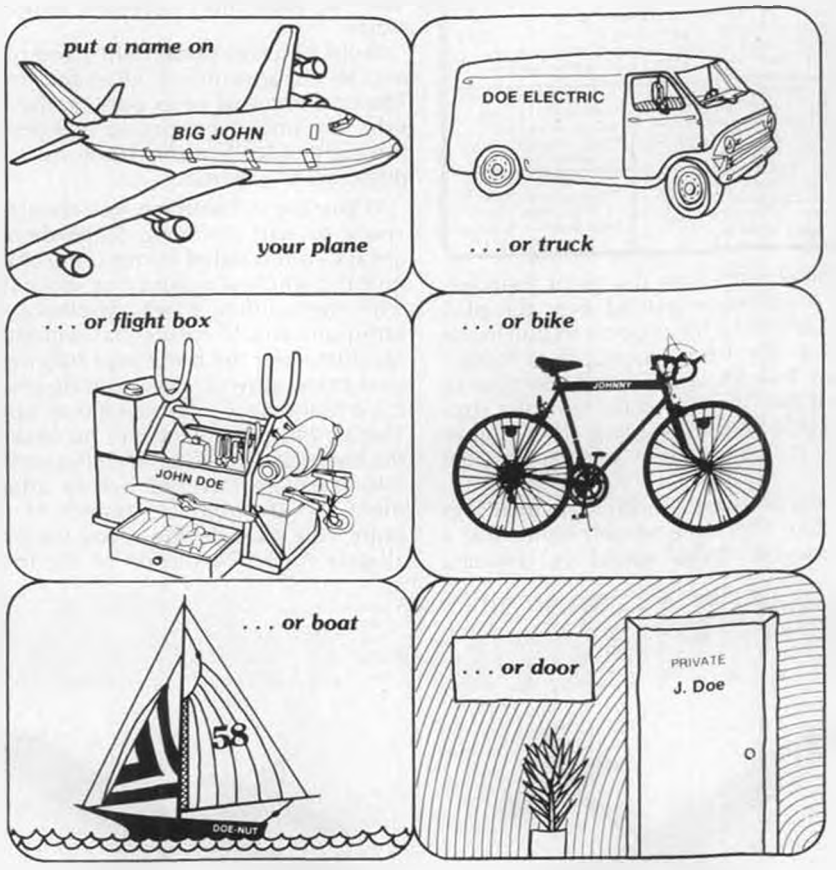

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identical sides over the plans, remove, and erect while pinned over the plan view. It takes a bit of doing to pull in the sides at the front. A couple of rubber bands will be appreciated. Be sure to install the 1/32 plywood rear peg support prior to assembling the fuselage sides. It is a lot easier to do it on a flat side.

Bend and install both main gear legs and like the nose wheel, either use a commercial balsa wheel or laminate your own. Bush as per the nose wheel.

The nose block assemblies are also standard. Be sure to use some type of ball bearing. I used the JASCO .062 size available from Old Timer Models. Also, .062 music wire was used for the front hook and winding eye. A conventional free wheeler was also installed on each prop hub. Note that the two free wheelers are opposite from each other. Prop spinners are removable.

The three-blade props are scale and I highly recommend the version shown on the plans as being very efficient. The blades are 1/32 plywood, and after water soaking, are formed on a 4-inch diameter bottle at a 15° angle from vertical. Make three left-hand and three right-hand blades. Three should slant to the left and three should slant to the right. Let them sit for three to four days or bake at 250° F. for an hour or two.

The hubs are straightforward and very strong. Bush each hub and nose block with 3/32 O.D. brass tube. Make sure the bushings are true, otherwise your props will wobble. Glue the ply blades to the hubs, ensuring that you have exactly 120° of separation between adjacent blades.

Build a conventional right-hand prop and an unconventional left-hand prop. The conventional prop goes on the left side. The unconventional prop goes on the right side. See the front view for direction of rotation.

If you are still with me, you should be ready to start covering. Since there is always an unsanded bump somewhere, give the whole structure one more shot with the sanding block, assemble the entire airframe to ensure that everything fits (including the horizontal stabilizer), bask in the glow of your building genius for a moment . . . then take it all apart. That's right. This plane can be covered the easy way: in pieces. Even the vertical stabilizers are covered before attachment. What could be easier? At this point you must decide if you want the all-gray Air Force version or the forest green, white, and gray Marine scheme. I chose the Marine decor, as I thought it a bit more exciting than all gray.

As designated by the North American literature, the Marine wings are all white top and bottom. The horizontal and vertical stabilizers are both forest green. The three fuselages are green upper and gray lower surfaces, separated by a wavy line.

I obtained the wavy line demarcation by laying a length of green tissue over a corresponding length of gray. I then cut a wavy line with a sharp razor blade through both pieces. This works especially well if you do the cutting on a layer of newspaper. Then overlap the two 1/16 of an inch and glue together with diluted white glue. The overlap is not too apparent. Make up six such pieces for the two fuselages and the center pod. Or, you could airbrush the green over gray.

Water shrink the tissue and apply one thinned coat of dope before final assembly. You can also apply all markings and insignia before final assembly. It's a lot easier to do it now.

When the fuselages are glued to the wings, make sure they are true. Do not offset the thrust lines using the fuselages. Glue in the horizontal stabilizer, making sure that it is correctly positioned as shown on the plans.

There you have it. One completely assembled North American OV-10A. But before you fly, put on another coat of dope. Two coats should be sufficient. Any more adds weight and doesn't really help.

Make up two motors about 22 inches long; each motor should be six strands of 3/16 flat rubber. I used F.A.I. brand. Braid the motors to shorten them and install. Attach at rear with 3/16 aluminum tube pegs. Also, be sure you slip pieces of plastic tubing over the front prop hooks. They may save you from a blown motor due to a minute nick in the prop hook.

Wind the motors just enough to hold

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the nose blocks in place. Pin the props so they cannot rotate and balance the model at the point shown on the plans. Do not attempt to fly unless the center of gravity is at or slightly in front of this point. Add weight as necessary. Mine required nose weight.

I just happen to have 75 acres of waist-high grass right next door to me, which really facilitates hand gliding to check for turn, warps, C.G. location, etc. If you do not have access to some kind of tall grass, I hesitate to recommend test glides.

You might try 100 turns on each side and ROG the model for its maiden voyage. Set the rudders and the elevator at neutral before the first glides or launch. Use up elevator to correct for a fast nose-down glide. If you need more than 1/16 inch of up elevator to flatten the glide, remove some of the nose weight and omit the up elevator.

If the elevator settings produce large pitch changes, you need to move the C.G. forward in 1/4-inch increments until the sensitivity is reduced to a manageable level.

You should make all pitch adjustments with the props pinned and the rubber tensioned. This ensures the C.G. will stay put while you are trimming.

Put in 100 turns on each side, making sure that the motors are lubed, stretch wound, and that you have wound the two motors in the correct directions. Remember, they are counterrotating!

My Sig winder had the chuck and winding hook threaded onto the winder shaft. It is not pinned or brazed. Since I have used this winder for several years with no problems, I was totally unprepared when I wound the right-hand motor. Since it is wound "backwards," at 75 turns or so the rubber had enough torque to unscrew the chuck from the winder. The chuck and rubber tried to bury themselves at the back of the right fuselage! Unbelievably, no damage was done. I have since switched to a winder which has the chuck pinned! Either that, or locate a left-handed winder. Let me know if you do.

One hundred turns on each side should be enough to see what the model is going to do. It will probably turn to right or left and might roll in to that side.

To prevent this, add a 1/16 shim to the inside of each nose block. The left motor should have left thrust, and the right motor should have right thrust. This adjustment offsets a weak motor and prevents the stronger motor from drastically turning the plane to the weak side. Make this adjustment before your first powered flights. And make it equal on both sides.

My model did not require any down-thrust at all. It flies to the left, to the right, or straight ahead with both motors canted outward 1/16 inch at the nose block. Rudder is used (about 1/8 inch of offset each side) to control the turns.

Because of the huge vertical stabilizers and no dihedral, it can and will drop the inside wing in a turn and roll in. This is managed by putting a 1/32x1x6-inch down aileron on the bottom of the inside wing. It should be about 3/16-inch down at the trailing edge.

Of course, you could also build scale ailerons into the wing. These would indeed be functional. Or you could severely wash-in the inside wing. I didn't

do this because it flies so well to either side or straight ahead that I wanted to keep all options open. Functional ailerons would be best. I highly recommend them.

The model is very stable in flight. Perhaps this is due to the gyroscopic effect of the two props and zero torque. With both fans turning it is an impressive sight. The two low-pitch 9-inch diameter props provide plenty of thrust. It will almost fly right out of your hand. Do not use thrustline adjustments to control the turn. The side thrust adjustments are incredibly sensitive. You will get right or left turns you never heard of if you start fiddling with variable mixes of turns, strands, and side thrust.

Keep the number of strands, motor length, number of turns, and side thrust equal. Use the rudders for turns. They are very mild; 1/8 inch of rudder offset will produce a nice, gentle turn. But don't forget to keep that inside wing up.

Work your way up to 350 turns on both sides with the six-strand motors. I am sure you will be amazed as I was at the inherent stability of this model. It is one rubber model where the more power you add, the more stable it seems to be. The climb is rock solid; gusts do not upset it. I attribute this to the low center of gravity, high wing, 9-inch 3-blade props, and counterrotation, which cancels torque.

It is truly strange not to have to work with or against torque. How many models have you built that would fly to either side or straight ahead just by bending the rudders? Believe me, it is weird.

A word about winding and launching: it takes two people and at least four hands to wind one motor, hold it and the other rear peg while the second motor is wound. Then the helper must hold one prop while the builder holds the other prop and launches. The aft foam block on the center pod makes an excellent hand hold for launching. I count to three; on three we both release our props while I gently toss the model straight out. It will climb right from the launch. If not, add a touch of up elevator. If it still will not climb, remove nose weight in gradual increments. The elevator should be kept close to neutral and down elevator should never be required. If so, add nose weight fast because you are into stall country.

Once you are comfortable and thoroughly familiar with six strands and 350 turns on each side, add two more strands (another loop) of 3/16 rubber to each side and stand back, because now you've got a Bronco on your hands.

And try some ROG's, too. Mine gets off in five to eight feet with full power. I find the sight of a rotating twin to be absolutely fascinating. My model as it sits is certainly not an endurance model. It weighs over seven ounces without the rubber installed. With 234 square inches of wing area, wing loading is pretty high. But the objective was accomplished. I set out to build and fly a big rubber twin. I think you will enjoy it as much as I have. Twins are twice as much fun! •

Hannan . . . . . *Continued from page 53*

stamps should appear at approximately the same time, especially since the Rogers stamp is part of the "Performing Arts" series. The Rogers tribute should be of equal significance to aviation-minded people, since he probably did more to publicize air travel for the general public than anyone except Charles Lindbergh. He is also fondly remembered, of course, for his ability to see through the chicanery of politicians, and certainly he would have a field day on that subject today!

HOW SENSITIVE IS IT?

Leafing through a back issue (July 11, 1966) of *Aviation Week*, we were astonished to learn how sensitive radar can be. During tests, captive birds and bumblebees were released from aircraft under radar observation. It was proven possible to track a single bumblebee in flight!

PREAF ROODER DEPARTMENT

Somehow a gremlin slipped "Fury" into the photo caption on Doug McHard's beautiful Hawker model pictured in our December "Hangar." Among the first to point out this flagrant boo-boo was Flightmaster Ken Hamilton, who quite rightly states that the Fury was a single-seater, whereas McHard's model is the two-place Hawker Demon. Ken goes so far as to identify this particular craft as one of No. 23 Fighter Squadron, who used the motto "Semper Aggressus" (Always having attacked). Thanks to Ken and other readers who took the time to set the record straight . . . we're pleased you are all so alert!

SOUNDS LIKE A WINNER

According to Dr. John Martin and Dave Linstrum, a contest billed as "The First World Peanut Gran Prix" is to be conducted on June 25th at the renowned West Baden Atrium, in Indiana. This fabulous indoor site has gained fame for its unique configuration which measures some 94 to 110 feet in height (apparently depending upon who is doing the measuring) and features sleeping quarters around its periphery. Past events have been acclaimed for their low-key conviviality and duration (the models AND the builders who sometimes fly all-night long!).

Word is that the meet will be directed by Butch Hadland, of England, who announces that he also plans to compete. Mike Arak has volunteered to coordinate the proxy-flying arrangements. Helpers are needed, as the group "does not have a vast staff of hot pilots like they do at **Model Builder**." *Seasoned Peanut Pilots* and potential contestants are urged to contact Mike at 10900 SW 61 Ct., Miami, FL 33156, U.S.A. Please include enough postage for reply purposes.

IT'S THAT TIME AGAIN

This column is being composed shortly before year's end, traditionally a time for reflection and review. We feel particularly grateful for the continuing support we have had from the staff of this publication, our many contributors, and the rewarding comments received from our audience. We wish all of you the best for the New Year, and success in your pursuits . . . both vocational and avocational.

SIGN OFF

This month's chuckle is from the wrapper of a chocolate bar manufactured in Finland, and shared with us by Frank Scott. Featuring a vintage-looking biplane, flying over a blue and gold colored label, it states: RECOMMENDED FOR FLYING MACHINE OPERATORS AND OTHER PEOPLE. •

R/C Auto . . . . *Continued from page 35*

got my copy of the annual meeting minutes. After reading them over, I was surprised at what I saw. There has been a lot of talk by racers in some classes, yet none of those proposals were seen. Either the rules were not submitted, or they were voted down by the ROAR members present. A majority of the ROAR regional directors should be able to place a rule on the ballot . . . in fact, I think the bylaws only state that the membership should have the opportunity to approve or reject the proposed rules. Besides, members present at the annual meeting might mostly be from one region or biased toward one manufacturer, etc., etc. Larry Flatt's comment in the December '79 *Rev-Up* reflects my views as well: "The officers of ROAR should reassert control of this organization while we still have a viable organization. If the members don't like the way the officers run the organization, they should elect someone else."

Anyway, here are the proposed rules concerning 1/8 scale, condensed a little as required. Remember the vote will be to leave the rule as is or to change to the proposed rule. (However, please note changes to ROAR guidelines which are not voted on: Superstock will be run on

the road course in the opposite direction and alternate between G.T. and Formula bodies, starting with Formula bodies for the 1980 Nationals; and safety regulation 1.03: Everyone must wear closed toe shoes at all times while at a race site.)

Rule 4.05: 1/8 scale fuel tanks. Currently 4 oz. max. (or 118cc), proposed 125cc max. Vote for the 125cc max limit. This will make our fuel tanks the same as EFRA and JMRCA and standard worldwide. Besides, we always use a cc graduated syringe to check fuel tanks at big meets.

Rule 4.09: Tires. Two things brought up in the 1/12 meeting will affect 1/8 scale. First proposal is to disallow silicone tire coatings (because they screw up carpet tracks, I think). Vote to disallow use.

Second proposal is to disallow use of cleaners and traction additives to tires that can coat the track surface. I saw this happening at the 1/12 scale Western regionals and it may also happen at 1/8 scale starts. Let's nip this before it gets started. Vote to ban traction additives and cleaners to tires which coat the track.

Rule 4.16: Windshields. An addition to the present rule is proposed to allow windshields less than 1/4 inch in height to be painted. It is impossible to see this when a car is racing or is more than four or five feet away. I will vote for the addition.

Rule 4.24: Roll bars. The proposal is to eliminate the rule. Part of the rule was written to eliminate super high and super wide roll bars which would help the car right itself when tipped over. This was particularly prevalent in 1/12 scale and was unsightly. I agree, legal roll bars are a pain and usually non-functional. But will the unsightly high and wide roll bar return? I think we should leave the rule as is, and change it correctly next year to "If a roll bar is used it must be no more than 1/2 inch wider than the cockpit opening and not more than 3/4 inch above the driver's head." Vote to leave rule as is.

Rule 6.31: G.T. Bodies, Proposal: "G.T. bodies must be models of *production* cars actually raced." Addition of word "production" in present rule to clarify intent only. Vote for addition.

Rule 7.03: Superstock fuel. Proposed to ban nitro; presently there is no restriction. This should help engines last longer, reduce tire wear, etc., and even out the competition. EFRA is proposing to the World Organization (IFMAR) to ban nitro in all classes. Superstock is a good place for us to start. I understand there is a method to test for nitro in fuel. Vote to ban nitro in Superstock.

New Rule: General, radio equipment limitation. Limit to use of two servos or use of two channels operating one device each. Presently there is no restriction. Presumably, this is to keep costs down and keep from getting too complex. I haven't seen anything to warrant this attention, and some people do like to play around. But since almost everybody uses only two servos/two channels, my vote will be for the two servo limit.

WOW! Well, that's it for this month. Until next time, remember easy does it. ●

Stooges . . . . . *Continued from page 62*

make, model, or age of car. If it is not practical to have the stooge pointing upright, it could be hooked on the lower edge of a bumper and used with the model hanging downward. Most cars have a very sturdy supporting structure for the radiator, which might allow use of the stooge with the hood open. It would be best to avoid using any part of the car body surface sheet metal as an anchor point, unless there is some extra reinforcement present. The clamp is an important part of the stooge. While the bracket will probably hold any model you're likely to wind, it does tend to move around a bit unless clamped in place.

An alternate method to the C-clamp shown in the photos would be to drill and tap the hooked lip for a thumbscrew, which can be tightened against the supporting material. Also shown in the drawing is a retainer cable for the 1/8-inch wire pin. The retainer can be made from a short length of control line wire. These improvements on the basic idea help minimize the number of loose pieces of equipment to be carried in the

toolbox. After the motor is wound, I'd suggest lighting the DT fuse before pulling the wire pin from the model's rear tubing peg. This seems to be easier than trying to hold the fully-wound model by the prop hub and noseblock with one hand while trying to light a fuse with the other.

SMALL MODEL STOOGE

This stooge is designed to protect small models from overly strong helpers, and to allow flying without helpers. It is adaptable to a wide range of model sizes and incorporates foam rubber covered supports for the front end of the model.

The stooge in the photo was built using part of a yardstick for a base, with the remainder built from scraps of wood and aluminum. The movable arms on the front end support can be built up from small strips of wood or made with slots cut in larger strips. Note that both holes and notches are shown in the rear peg anchor. This allows winding models equipped with either pins or small tubing pegs. Attach the rear peg anchor to the base with a wood screw. Set up the front support aluminum strips so that friction will hold the support firmly in place, but loosely enough that it can be moved when desired. This small model stooge can be clamped or screwed to the top of a tool box or held securely with a couple of large nails pushed into the ground through holes in the base.

The front end support idea from the small stooge could easily be adapted to the larger one, is desired. The use of these winding stooges should help you get in more flying, with less imposition on friends or family for holding duties.●

Quail . . . . . *Continued from page 55*

The first way is to make a rib pattern out of thin cardboard or thin plastic to the shape of the wing rib, including notches for the spars. Using this pattern for a guide, cut out 18 identical ribs one at a time from the 1/16 sheet.

The other way is to cut two balsa ribs to the correct shape. Then cut 16 pieces of 1/16 sheet balsa to the right length and width for rectangular rib blanks. Stack all the blanks together and put a rib on each side of the stack. Using straight pins pushed through everything, clamp it all together and carve all the rib blanks at the same time to match the end ribs.

Whichever way it's done, make sure all the ribs are as identical as you can make them. Use fine sandpaper to smooth out any rough edges.

Now cut two wing tips from 3/32 sheet balsa to match the shape shown on the plan.

Pin the 3/32x1/4 trailing edge pieces on the plan. These are wide enough so that a pin through them will probably not split the wood or seriously weaken it. Now take two ribs and cement their aft ends to the trailing edge, one near the tip and the other close to the center (but not at the center) rib. Cement the leading edge 1/8x1/4 balsa stick on these ribs using pins through the work board to hold the leading edge in place. Do this for both the left and the right wing.

Now carefully cement all the ribs in their proper locations between the leading and trailing edges. All the ribs except the center ribs should be exactly vertical with respect to the work board.

The two center ribs, one on each wing, must be leaned towards the tip of that wing a very slight amount to allow for the final wing dihedral angle. Cement the wing tips in place. Block them up above the work board about 1/8 inch at the start of the wing tip curvature. Of course, they must be cemented to the trailing edge at the back, which is pinned to the work board. Let the wing dry and then add the two 3/32 square spars.

The ends of the spars where they are cemented to the tips must be scored with a razor blade at the tip rib so they can be bent sharply down to the tip, and they must be beveled to fit the tip neatly.

Let the wing assemblies dry completely.

8) CONSTRUCT THE BODY BOX. The main fuselage structure is a box consisting of the two fuselage sides separated by appropriate crosspieces and formers. Remove the fuselage sides from the plans and, using a razor blade, carefully separate one side from the other. This is done carefully one joint at a time. Wiggle the razor blade gently rather than just pushing it along by brute force.

All crosspieces are cut from 3/32 sticks. These can be the softest sticks available. There is a crosspiece at the top and bottom of each upright. Cement the fuselage sides together at the very tail end. Then cement the crosspieces from the wing trailing edge location to the rear motor peg. Again, make sure the fuselage is true and the sides vertical, and let the assembly dry.

Crack the longerons at the bend back of the windows and add the crosspieces forward to the nose. Let this assembly dry completely.

9) CONSTRUCT THE ENGINE COWLING AREA AND NOSE BLOCK. Cut out former A, C, two B's, and two D's from 1/16 sheet balsa. Remove the top crosspieces at A and C and replace them with the formers. Do likewise at B and D, leaving a slight space between the sheets for the landing gear wire.

Now cut two pieces of 1/32 sheet to fit the fuselage sides between A and B and between the top and bottom longerons and cement in place. Cut two pieces of 1/16 sheet to cover the bottom of the fuselage from A to B. Laminate the two pieces to make one 1/8-inch thick piece for the bottom of the cowl.

Use a piece of paper to make a pattern for the 1/32 sheet top cowling piece. It is wrapped around formers A and C and cemented to the longerons. Cut the balsa slightly oversize and trim it carefully to fit. If your balsa sheet is too stiff to bend around the formers, wet it with water, which will soften the balsa.

Carve the cowl bottom laminations to shape.

10) CONSTRUCT THE NOSE BLOCK. The nose block is composed of two major pieces which, because of their thickness, must each be laminated from three pieces of 3/32 sheet.

The nose block forward of A is shaped as shown in the side view, top view, and the section above the detail of former A.

The other part of the nose block is made to fit snugly in the front of the fuselage box. Its shape is shown by the dotted line in the section above the former A detail. However, building tolerances may vary from model to model (especially for beginners) in this area and this part should be carefully made to fit the nose of your own model.

The nose block assembly should be easily removable from the front of the fuselage box, but should not fall out on its own accord.

Make the front part of the nose block slightly oversize. Cement the two major parts together. When dry, fit the block in the nose and, using a sharp razor blade, carve the nose to shape. Use fine sandpaper to obtain the final contour and match the rest of the engine cowling shape.

Now locate the position for the hole in the nose block to accept the thrust bearing. Drill a through hole.

A standard drill bit can be used to make holes in balsa, so long as you go slow and carefully. However, neater, cleaner holes can be made using a sharpened piece of brass tubing. If you have a piece of suitable diameter brass tubing, you can sharpen it by using a knife point to bevel the inside to a sharp edge. This can then be twisted while it is being pushed through the block. Back the block up with the work board so the back of the hole will not just split out.

With practice, the brass tube method of making holes will result in very neat, smooth holes in balsa.

11) CONSTRUCT THE PROPELLER ASSEMBLY. The plastic propeller and the plastic thrust bearing used for this model can be obtained at most model shops, or can be purchased by mail from Peck-Polymers. (See advertisement in this magazine.)

Bend a hook to match the shape shown in the side view. Thread this through the nose block assembly and the hole in the thrust bearing. Put a washer on the wire and then thread it through the propeller. Then bend a short right angle on the wire to retain the propeller.

For the simplest airplane, no spinner is required. However, one can be installed if you so desire.

12) CONSTRUCT AND INSTALL THE LANDING GEAR. This is composed of two main assemblies: the nose gear and the main landing gear. Each assembly is composed of three types of parts: the wire landing gear structural member, the wheels, and the fairings that make it look like the scale landing gear.

The wheels can be purchased, or made by the builder. On the model in the photograph, the nose wheel is hardwood and the main wheels are inflatable Trexler Airwheels (No. 2), which are very lightweight balloon tires on hardwood hubs.

For lightweight wheels at minimum cost, make them by laminating several balsa discs. Here is how to go about making a balsa wheel with only sandpaper, pins, and a razor blade for tools.

Take the 3/32 sheet and cut out four balsa circles the diameter of the main wheel. Poke a center hole in each balsa circle with a pin. Now, changing the grain direction, cement the discs into a four-layer stack using a pin to make sure they are all concentric.

When this is dry, use the sandpaper to shape the tire. Then paint the entire tire flat black. From heavy paper (I like magazine cover paper because it is strong, shiny, and can be found in almost any color), cut out two wheel hub discs per wheel. Put a pin hole in the exact center and cement them on both sides of the wheel. Make all the wheels in the same fashion.

Now, using the piano wire and the pliers, bend up the main landing gear wire to the shape shown on the plan. It should lay flat on the plan after it is bent. If it won't lay flat, adjust all the bends, one by one, until it does. A wire that won't lay flat will make a landing gear assembly whose wheels do not track parallel.

Slip the wheels over the wire and hold them in place with a drop of cement.

The nose gear wire is bent similarly, but it is a little more complicated. Bend it carefully to match the shape shown in the side view and in the landing gear shape details. Retain the nose wheel with a drop of cement.

When the cement is dry, try fitting the wire into the fuselage. When it fits properly, cement it in place. Adjust the nose gear, if necessary, to make the model roll straight ahead.

The front fork representation and the main landing gear spring fairing representation can be simulated with paper, card, or even balsa sheet.

13) COVER THE MODEL. This can be an unlucky step for a beginner, but it will turn out well if you are patient and willing to do a piece more than once.

The first and most important step in covering any model is to make sure the balsa structure is shaped correctly and is smooth. There is no way to get rid of an unsightly structural bump under a finished covering job.

Remove all the assemblies from the work board. (If you've followed these instructions in order, the cement is certainly dry.) Inspect each one for unwanted cement bumps or other imperfections, and remove them. Then, using the sandpaper, carefully shape the leading and trailing edges to the section shown on the plans. The leading edges of the wing and tails are rounded, and the trailing edges are tapered to a triangular cross section. The tips of the tails are not rounded, but the wing tips are sanded to a smooth rounded shape that blends into the leading edge and matches the trailing edge.

Lightly sand all the structure to remove bumps and get smooth, faired contours. A large flat sanding block is a help because it spreads the load over

several items of structure and helps keep sandpaper corners from catching and knocking ribs loose as you sand.

When you think you are done sanding, inspect each part, and do it again very lightly. Blow off all the dust from the sanding effort. Clean, smooth parts are essential for a good covering foundation.

Now take your tissue paper and look at it. If it is wrinkled, iron it smooth using a low heat setting. The tissue has a grain to it. That is, most of its fibers are in one direction. All parts should be covered with the tissue grain direction matched to the long direction of the part.

Cover the parts in the order in which they were built, simple ones first. Cut each tissue piece slightly oversize. About 1/4 inch extra all around is about right for the tail pieces.

I like to use about 20 layers of newspapers on top of the work board as a cutting surface for the tissue.

The best adhesive I've found for attaching tissue is white glue thinned out with an equal amount of water. Model cement will work, but it tends to dry out too quickly.

Take the horizontal tail and apply a thin coat of adhesive on the outside edge structure only. Do not get glue on any inner structure. Now, with the proper tissue piece laying flat on your work board, set the structure on it glue side down. Immediately pick up the part. If the tissue was smooth and the part was smooth the covering will be okay as is. Make sure the tissue is attached all around the outline, pressing it down with a fingertip wherever it isn't. If there are wrinkles, pull them out gently by grasping the loose tissue outside the structure and pull it in opposite directions. Set the part aside to dry.

Cover one side of the vertical tail, the bottom of each wing panel, and one side of the fuselage similarly. When this has been done the first part will probably be dry, and the excess tissue can be trimmed off. A very sharp razor blade is required to trim tissue without tearing. Nothing will cut wet tissue satisfactorily, so the part must be dry before trimming. Slice the excess tissue off all around the horizontal tail. Do the other parts also.

Now cover the other side of the tail surfaces in a similar fashion and set aside to dry.

The upper surface of the wing, because of its contour, requires a slightly larger amount of excess tissue. Cut it about 1/2 inch wider than the wing panel, all around the edges. Apply adhesive to the leading and trailing edge, the root rib, and the wing tip. Then lay the part on the work board and gently lay the tissue in place on top. Starting at the center of the edges, gently stretch the tissue and adhere it to the structure. Pull out all the wrinkles, if possible.

The second fuselage side is covered like the first. The top and bottom of the fuselage are done similarly. A separate piece of tissue is required for the top and

bottom cowl pieces. Cover the outside of the nose block with tissue too.

The covering now needs final trimming. To get the tissue color continuous around the leading and trailing edges, the final trim should be about 1/8 inch outside of the structure. This excess tissue is then wrapped around the edge and cemented down. Where the outline is curved, as on the wing tips, the excess tissue must be slit several times so it will lay flat without wrinkling along the edges.

14) SHRINK THE TISSUE. The model is covered and will certainly fly if nothing more is done to the covering. However, to get a really nice looking cover job that will last, the tissue must be tautened and doped.

Wet tissue will shrink, and when dry will be tighter and smoother than before. However, very wet tissue will dissolve and sag off the model. To shrink the tissue it should be lightly dampened. The best way is to spray it with a very fine mist of water. I have used a Mennen's spray deodorant bottle as my spray gun for years, but any sprayer that will give a very fine mist is fine.

The tissue will sag as soon as it is damp, indicating that it is wet enough. Don't overdo it. Prop the parts up so they do not have tissue laying on the work board or other surface and allow to dry. When dry, inspect the covering. There may be loose sections that need more shrinking. If so, do it again.

15) DOPE THE COVERING. Thin your dope at least half and half with dope thinner. Use a soft brush and put a thin coat on all the parts. Do both sides of a part as nearly at the same time as possible. The parts will really warp if you dope one side and let it dry before doing the other side.

Two coats of dope will be enough for the wings and tails. The fuselage should be given one or two more because it will be handled quite a bit.

16) INSTALL THE WINDSHIELD AND WINDOWS. Use thin clear plastic, cut it slightly larger than the window opening, and using thick dope or model cement, glue it in place. Use care to avoid smearing the clear plastic.

Cut the windshield to match the pattern. Temporarily put the wing in place and install the windshield, cementing it to the cowl and the fuselage uprights but not to the wing.

17) COMPLETE THE SCALE DETAILS. Using a black felt pen, draw the movable surface outlines and the door outline. Carve the cowl cheeks from the block balsa and cement in place. Make the magneto and the gas tank cap from scrap balsa and install them. Add the rudder

tab, made from thin card stock.

If the model is to have color trim, apply it at this point. Carefully cut contrasting colored tissue to the exact shape and install it, using thin dope as an adhesive.

Cut out tissue numbers or use commercially available decals for the license numbers on the fuselage sides.

18) ASSEMBLE THE MODEL. Cement the two wing panels together at the proper dihedral angle. Cement the horizontal tail into the slot in the vertical tail. Cement the wing in place. Cement the vertical tail in place on the aft end of the fuselage. Make sure the surfaces are all lined up accurately.

Tie a loop of rubber together to make a motor about 16 inches long. Drop it into the fuselage so that the aft motor peg can be inserted to hold it. Hook it onto the propeller hook and wind the propeller a few turns to eliminate the slack and put the nose block in place.

HOORAY!! The model is finished. Ready to go flying? Not so fast! There are a few more important items to perform.

19) MAKE A PREFLIGHT CHECK. Before you even try your first test glide, inspect the entire model. Make sure all parts are securely fastened. Look at the model directly from the front and directly from the back to make sure the wings and tails are on properly. The tail surfaces should not be warped at all. If they are, hold them over a heat source and twist them opposite to the warp, holding them until they are cooled off. Eliminate the tail warps.

The wings should have a small twist in each one. Their structure is such that they tend to warp correctly, but they may not warp the same amount. What is desired is a slight amount of wing twist so that the trailing edge at the tip is about 1/8 inch higher than the leading edge. This is known as "washout" and helps the model fly smoothly by keeping the wings from stalling at the tips. Make sure the wings are properly washed out.

Ballast the model using modeling clay so it balances at the indicated CG.

20) FLY YOUR MODEL. Wait for a calm day; don't try it in a high wind. Find some nice smooth grass to make the first test flights over. Test glide the model. It should glide smoothly straight ahead. If the model dives, either remove a little nose ballast, add a little tail ballast, or warp the trailing edge of the horizontal tail up.

If it noses up and stalls before diving into the ground, it requires opposite adjustments.

If it turns sharply to either direction, check the vertical tail for warps and the wings to see that they have the same washout. If the surfaces are correct, it is possible that one wing is heavier than the other. If this is true, add clay to the light wing for balance.

When you have a proper guide, wind the propeller about 50 turns and try a short hand-launched flight. This should merely extend the glide. Make a series of test flights, gradually increasing the number of turns until the model is climbing nicely. If the powered flights show signs of strong deviations from a desirable pattern, use thin balsa shims between the nose block and the fuselage to alter the direction the propeller will pull the model.

The most usual thrust adjustment required is "down thrust," which is needed to keep the model from trying to climb too steeply under power. Side thrust is used to alter the powered flight turn directions.

For long flights, wind the propeller with the rubber stretched out. Have someone hold the model for you and pull the nose block out until the motor is stretched two or three times its relaxed length. Wind the propeller, gradually returning the nose block to the fuselage as the maximum turns are put in. A commercial rubber lube or castor oil can be used to make the rubber slippery and allow maximum winds with a stretched motor winding technique.

Have fun with your Quail. •

C/L . . . . . *Continued from page 51*

you'll become a competent diesel operator. So go ahead, build a plane, and get started. If you link up with someone down the road, you'll have that much of a head start.

"2) No respectable Team Racer would be caught dead without a pressure refueler. However, the ones we've tried seem to get more fuel on the plane and on the ground, than in the tank. That's why we're still using the time proven uniflow tank, and refuel with a bulb. Our set-up is just like what you see on most Big Goodyears. A pressure refueler *may* save 1 or 2 seconds per pitstop, but when you're still working on the tens of seconds and half minutes, why make things any more complicated than they have to be?

"3) Internal leadouts are a huge pain in the rear. You've got to worry about kinking the lines and keeping the line reel attached to the plane. Sure, they probably reduce drag a little and give slightly more airspeed, but again, the increase is measured in seconds over an entire race. For serious competition, go ahead, but on the first couple planes and for practice flying they're a complete waste of time . . . time better spent elsewhere.

"4) One of the problems with almost any competitive endeavor is figuring out what it really takes to win. Last year it was retracts. Numerous people spent countless hours trying to figure out how to build lightweight, reliable retracts. Others paid as much as $200.00 for ready-made units. What happened at the World Champs? *None* of the top finishers used retracts. Retracts are another perfect example of people trying to make things more complicated than they have to be.

"5) Fiberglass fuselages are definitely nice. Every team racer we've built has used one. The point is, you don't *have* to have a fiberglass fuselage to get into Team Race. Larry Fagan and Tom Hail built a beautiful all-balsa ship. Their plane was so easy to build and went together so fast, they're planning to stay with balsa in the future. In fact, many top competitors build all-wood planes.

"6) *The best motor* to use for Team Race right now is the Nelson .15. They're not cheap and it takes quite a while to get one, but they're worth waiting for. They're extremely easy to operate and come ready to race. However, if you cannot get a Nelson right away, don't worry, other diesels *are* available. The old reliable S.T. .15RVD is a good example. They're inexpensive, can be made race ready with very little work, and are capable of turning reasonably good times in the right hands. Whatever you do, don't make THE BIG MISTAKE: a glow conversion. Glow conversions can be made to go, but are best left in the hands of experienced fliers who have access to more than 24 hours a day. Your time (and mine) will be better spent learning to operate a slower, but more reliable diesel.

"7) If you've been around Team Race at all, you've probably heard the phrase "Light is right." Again, this is strictly for serious competitors. Granted, light planes may go faster, but they also eat pilots for breakfast and tend to break. For the first couple planes at least, build for *durability*. The best way to have fun flying Team Race is to fly; fixing planes is a drag. Both of our practice planes are lead sleds by modern day standards, but they're also over two years old. When you build as slow as I do, they *have* to last.

"8) Most serious Team Racers either have some metalworking tools or have access to them. Beginners and intermediate fliers don't have to have any more tools than it takes to build a Goodyear. In fact, the less machine work you do, the more time you'll have to fly; the more flying you do, the better you'll get, and the more fun you'll have.

"9) Every time I turn around, someone's talking about a titanium this, magnesium that, or some other unobtanium do-dad. Close your ears to this kind of talk. It must be a conspiracy to keep people out of Team Race. The truth is that a world class plane can be built with materials available at any well-equipped hobby shop.

"Guess we've just about covered all the things you *don't* need; now, just what DOES it take? Surely there's got to be something complicated about Team Race. Not so. Actually, there are only two items I would strongly recommend: a shutoff and automatic primer.

"Although you can actually fly Team Race without a shutoff, *don't do it*. Standing around playing pocket pool while your brand new Nelson burns down is no fun. Shutoffs come in a variety of shapes and sizes, all the way

from a simple Goodyear type to a $50.00 multifunction valve. We've been using Kusik-style wire and spring tubing crushers from the beginning and have yet to experience a single failure. The only thing a multifunction valve will do that ours won't, is leak. Dave Elledge has designed a beautiful, easy-to-construct shutoff that also incorporates a fast filler. Drawings are available . . . all ya gotta do is ask.

"Most diesels need a prime to restart reliably. You can prime through the venturi or in the exhaust. An exhaust prime seems to be the most popular method and is what we use. It doesn't take much. A .012 hole gives our Nelsons a little more than they need. We finally put a needle valve in the prime line and can now dial in consistent one-flip re-starts. That's the beauty of a diesel . . . if it has the right amount of prime it will restart every time (unlike some Rossis I know about)." •

Soaring . . . . . *Continued from page 31*

fillets whatsoever). The new plane will weigh at least 45 ounces and have room for about seven pounds of ballast, thus producing wing loadings ranging from 7 ounces per square foot to 24 ounces per square foot. The fuselage will be about 56 inches long, the extra length for greater stability. It will be 2-1/4 inches maximum diameter, requiring support servos. Three channels will govern mixed rudder/aileron, elevator, and the canopy which can be deployed to form a spoiler or dive brake. This will be required if you are to land safely at 24 ounces per square foot wing loading. An additional servo could be included for a releasable towhook, or release could be actuated by hard-over elevator control. Clearly, such an aircraft is *not* for the beginner. In the near future, those interested may expect to see such a plane offered by Bob Smith Aircraft Co. . . . the same firm that now produces the Sea Breeze, a ready-to-fly plane well suited for the beginner. If you want more information on Kevlar or the building procedure described by Rick, contact him by letter (1705 Gascony Road, Leucadia, CA 92024) or phone (714) 942-0571.

By the time you read this, we may be watching a new F3B winner in the sky. Let's hope so.

See you next month. •

Flyaway! . . . .*Continued from page 18*

forever!"). But it's vitally important that you take an accurate, permanent sighting on the last point the model was visible. Which direction was it gliding? Which way was it turning? How high was it? How strong was the wind, and from what direction? These are questions that are going to plague you for *days* if you don't find the model. So make sure you know the answers to all of them.

When you're taking a sighting, think in terms of straight lines between two markers: "It went down just to the left of a line between this fencepost and that tallest pine tree on the ridge over there." "It's on a line between the third electric pole from the left and that house with the green roof."

And mark your markers well. Pine trees have a way of looking a lot alike, three or four hours into a search. So do fenceposts. The longer it takes to find the plane, the more important knowing the *exact* fencepost you sighted over will become, so be sure you can identify your markers beyond a shadow of a doubt before moving on. This is no time for haste: the plane is out of sight anyway. You may think you can walk right to where the plane is sitting, and maybe you can. But don't count on it. The free flighters, those folks who have a flyaway every time they launch, say that EVERY MODEL IS A LOST MODEL UNTIL YOU HAVE IT BACK IN YOUR HAND. So even though you saw exactly where it went down, take your sightings with care. And hope those guys back at the field are doing the same.

Take your transmitter along on the search. If the plane is down in trees or tall grass, you may be able to locate it by servo noise, provided the batteries are still up. (I've found lots of single-channel ships by the *click click* of an unwound escapement. And Monokoted surfaces will often flash in the sun when wiggled.)

Sometimes the hardest planes to locate are those that go down in plain

sight, right out in the middle of an open field. There's a rule that applies here, but you probably don't want to know it. It says *every piece of trash will look something like an airplane.* You'll see scores of things that have to be investigated, things that look just enough like a plane to make you walk hundreds of feet out of your way. (When you spot the actual airplane, of course, you'll know it beyond doubt, but that won't keep you from checking out a dozen or so mirages first.)

If your initial random search of the area fails to turn up your model, you may want to fall back upon some more orderly search plan, such as dividing the terrain into sections and searching one section at a time. Especially if you have help. There is another rule of the chase that may prove helpful at this point. It says *the airplane is always closer to you than it appeared to be.* If you were especially observant, you might have noted this phenomenon as the plane was disappearing; it looked like it was beyond the treeline, but when it got low enough you could plainly see that it was this side of the trees. Ninety percent of the time this rule proves true; you will ultimately locate the plane much closer than the point where it appeared to land. So if you don't find it immediately, you may want to backtrack a bit ... you've probably walked beyond it.

It goes without saying that you should have the landowner's permission to trespass, even if you can see where the model is sitting. America is not England. When I lived and flew in Devonshire, I found I was welcome to walk through any man's pasture, so long as I closed the gates behind me and spoke civilly to the farmer's kin and kine. But in lawsuit-happy America, this is not the case. Be especially careful of cropland and land with dairy cattle on it. They raise a lot of shotgun barrels on such land.

If your plane disappears into the suburbs rather than the pasture, don't be shy. Ask everyone you meet if they've seen it. Last fall I was flying some early-morning free flight over by Santa Rosa, and managed to drop one right into a mobile home park. It was an "adult village," one of those places so quiet you can hear the neighbor uncorking his Geritol bottle. My flying buddy and I drove round and round through endless acres of tin, hoping to spot the ship on somebody's manicured lawn. No one was stirring in the dawn's early light except a solitary paperboy, on foot. No doubt he had to check his bicycle at the front gate. About the third time we passed him I stopped and asked, "Don't suppose you happened to see a model airplane come down around here, did you?"

"Yeah," he said nonchalantly. "Went in that tree right there." He pointed right over our head, then walked away, tossing his papers gently onto rooftops and awnings as he went. He was an observant little rascal, but not one to get very excited about model airplanes. We got out and shook the tree and down came the model.

But suppose you didn't see the plane land, or disappear behind trees or houses. Suppose instead that it disappeared in the sky, still climbing. This is the kind of flyaway that makes your heart sink right down into your hip-boots. *What's the use even looking for that one,* you think; *it probably went 40 miles.* Well, it can happen; I once had a free flight returned by a lady who lived over 20 miles from the flying field. But this kind of distance is rare, event for light, perfectly trimmed free flights. The fact is, MOST RADIO PLANES COME DOWN LESS THAN A MILE FROM WHERE THEY DISAPPEAR.

Case in point: the only multi-channel flyaway I've ever had in sailplanes disappeared straight overhead on a crystal-clear day in Albuquerque. We had made sighting checks on similar planes and knew them to be visible (though not necessarily flyable, at least on elevator) to over 8000 feet of altitude. So we put that one at nearly two miles high (people who fly in coastal humidity will doubt these figures) when it went out of sight. Even with the most negligible northwesterly drift, it could cover a lot of ground, we figured. So we gassed up a Cessna 170 and scoured the earth for up to twenty miles downwind. All we found were dead sheep. The plane's carcass turned up a year later, less than a mile from the field. No one had seen it

come down because *no one had looked for it to come down.*

Since that time I've turned scale free flights loose and watched them thermal up into low clouds. When they disappear, I do two things. First, I keep my eye on the cloud, watching for a rain of pieces ... some of those clouds get pretty turbulent inside. Second, I drive or run downwind an equivalent distance to that covered by the plane before it disappeared. Then I park myself and watch as much of the sky as possible. Invariably the plane comes spiralling down out of the clouds somewhere ... not always exactly where you think it ought to, but somewhere. Thermals just don't last forever, and there's at least as much falling air as rising, up there in that sky.

So don't write a plane off just because it has disappeared while still climbing. Go downwind and scan the sky for flashes of Monokote, or dark specks that don't flap their wings. Chances are good that your plane will be on the ground in ten minutes or less after it disappears.

The other day I witnessed an interesting flyaway (see what I mean about calmness when it's not your own plane?) that occurred to a power flier. He was flying a two-channel half-A ship when his rudder control failed (turned out to be clevis popping out of one of those damned useless wheels manufacturers provide for output arms). He had full power on a screaming Tee Dee and only elevator to control it. Fortunately, the rudder failed close to neutral, and he wound up in a wide left turn, drifting away with the wind. Here's how we minimized the bad luck: every time the plane turned back toward the field (i.e., upwind) we dived her a bit to cover ground. Then when she swung away from the field we stalled her, partly to slow her down and cover less ground, partly to get her to mush and turn more quickly. Finally got low enough to put her into tall grass in a shallow upwind dive. No damage.

A sailplane could have been saved even easier, because it would be less likely to "go terminal" in a dive, or develop a deadly spiral. But basically the same maneuver would apply: dive upwind, stall downwind. If it's elevator that fails instead of rudder, the problem may be even simpler, because there's always somebody around who's flown single-channel, and knows how to break a series of stalls by hitting rudder just before the top of the stall and rolling out flat with almost zero airspeed. Or how to get out of a vicious thermal area that seems determined to steal your airplane, by simply flying straight in almost any (but preferably upwind) direction.

But these are rare cases, for radios usually fail totally or not at all. The important points to remember are the *rules of the chase.* If they help you locate

a single lost airplane, they will have been worth remembering, no? And remember, every off-field landing is a lost airplane until you have your hands on it again.

Meanwhile, how about taking fifteen minutes to go out to the shop and put your name and address on each of your models? •

F/F ..... *Continued from page 61*

might be interested in Ronnie Young's services. Ronnie used to work for Cox, and showed most of the California FAI fliers the potential of the Cox Conquest .15, both with prototypes and production versions. At Taft, Ronnie said the lack of production of the engine was going to be only a temporary one, caused by the factory running out of pistons and cylinders. Another batch of 500 engines, plus 1000 piston/liner combinations is due to be produced early in 1980, about the time you read this item.

Ronnie is no longer with Cox, but is involved in the setting up of Cox Conquests for competition purposes. His engines have held the R/C Quarter Midget records every year for the last three, and his own experience as an FAI flier means that he knows how to set them up for free flight, too.

No rework is done; what Ronnie concentrates on is providing the proper fits for optimum running clearances and performance (like "blueprinting" a stock engine in a drag racer). Ronnie will sell a completely set-up Conquest for $80, or $45 is you supply the engine. He also has a good supply of Conquest parts, at lower-than-factory prices. Contact him at 2137 Linda Way, Santa Ana, CA 92704. He says he's usually busiest in the spring months.

AND FOR PROPS

Now that you've got that hot-running FAI engine, how are you going to transmit all the power? How about some props from a former World Champ? Bob Stalick's been using some props he obtained from Lars Olofsson, and lent me some to try out. My engines lost a little rpm on the ground, but unloaded well in the air, and seemed to give a significant altitude increase over the other props I'd tried. So, I wrote Lars asking if his props were available. The batch he sent were beautifully made, well-thinned as they came from the mold, so they shouldn't require much work to get ready for use (a big advantage). Lars makes two types: his own 7x4 and a modified Verbitsky 1975 version. He also makes his own design in carbon fiber, for a higher price. (12.5 Skr for fiberglass; 18.75 Skr for carbon fiber, shipped air mail.) Prices are quoted in Swedish units, since Swedish banks are leery of cashing checks made out in dollars. Go to your local bank and purchase an international draft for the proper amount (at current rates, that's $3 and $4.50). Write to Lars at Box 8044, 421 08 Vastra, Frolundra, Sweden.

NFFS SYMPOSIUM, TOP TEN MODELS CONTRIBUTIONS NEEDED

The National Free Flight Society is soliciting papers for the 1980 Symposium publication. Papers should cover some aspect of the science or art of free flight models. Send an abstract of your proposed paper immediately to Bob Dodds, Box 436, Rancho Santa Fe, CA 92067.

Part of the Symposium will feature the NFFS annual Model of the Year Awards in the following categories: FAI events

(F1A, F1B, F1C), Indoor and Outdoor Rubber, Small (1/2A) and Large AMA Gas Power, HL Glider, and Special Awards. Send nominations of deserving models to Steve Geraghty, 194 Vista Del Monte, Los Gatos, CA 95030. (I'd like to nominate ABC-TV for their invention of the instant replay, which makes it possible to continue building throughout the football season without worrying about missing any of the action taking place on the workshop TV.)

BEEP, BEEP!!!

When I published some Nats comments in Midwest newsletters a couple of issues back, I mentioned how Gil Morris had used a model rocket "beeper" with great success in finding models, referring inquiries to Keith Fulmer, the originator of the idea, since I didn't have a copy of the original reference. Since then, Keith has sent me a packet of information, which is neatly summarized by this excerpt from Harry Murphy, in the CIA *Informer:*

"Keith uses the circuit board and components from an Estes Transroc kit and powers it with four Mallory R 400 hearing aid batteries hooked in series. The whole thing weighs 5/8 oz., and he installs it in the fuselage at the approximate CG of each model. The circuit board measures about 1 x 2 inches.

"Battery life is good for about 24 hours continuous operation and the range is about 1/4 mile depending on the weather, local CB interference, and battery condition. He monitors Channel 5 on a small inexpensive production walkie talkie and walks (not runs) downwind until he picks up the signal. As the signal gets stronger, he shortens the telescoping antenna until he steps on the model. Keith also passes on these comments: 1) Give Estes plenty of time when ordering; 2) Mount the circuit board in lotsa soft sponge, as a Rossi once vibrated the components right off the circuit board. Also, use fine flexible hookup wire rather than solid wire; 3) Use good fresh batteries in your walkie talkie.

"Should you be interested in investigating this wizardry on your own, Estes gets around $17.95 per kit ($7.00 more if pre-assembled). Catalog number is TX-1 for the kit; TX-1A for assembled version. The address is Estes Industries, Dept. TX, Penrose, CO 81240."

Jerry Fowler reports that he uses a Ray-O-Vac Type 10 L120 silver oxide wafer for a battery source, since they have a 90 mah rating compared to the Mallory's 60 mah rating. He also rigged up a simple on/off switch to extend battery life. (Keith leaves the unit on all day, discarding batteries after two contests, just to be safe. Battery life is approximately 24 hours.)

DARNED GOOD AIRFOILS: Simplex (E.S.)

This month's DGA is a bit unusual, in that no great aerodynamic reasons exist for its shape. It's a very useful shape, however, since it will let you cut out any chord length of rib from just one template. The Simplex airfoil is based on the properties of the mathematical curve called the equiangular spiral. If you cut off a section from the end of the curve, the remaining curve is geometrically similar to the original curve. What this means is that it's possible to cut a set of tapered ribs by slicing off the trailing edge of the rib, and retain the same airfoil for each rib, with the same percentage thickness, camber, and shape. I find this shape to be very useful when cutting out streamlined shapes for the built-up rudders and pylons I use. Just draw a center line, mark the chord length and cut along your simplex template on both sides of the centerline.

A more complete discussion of the uses of the Simplex series is given by Robert Annenberg in the Sept. 1972 *Aeromodeller* and the 1960 *Air Trails Annual.* These articles contain full-size templates, if you can find a copy. Charlie Sotich computed the ordinates and published them in the July-August 1977 issue of *Free Flight.* This month, I'm providing ordinates for the 9%, 8%, and 5% sections, which should be very convenient for making flat-bottom airfoils for AMA Gas wings and stabs. Plot them for the longest chord you plan on building (10 inches is convenient for me), then cut them out and keep around the workshop for future use. Next month, I'll include a few others that can

be used for making undercambered airfoils.

ENCYCLOPEDIA OF MODEL AIRCRAFT

I like to collect books about model aviation, and tend to buy any volumes I see in a bookstore on the subject. My latest acquisition is a real gem . . . probably the best effort on the subject yet. It covers every major facet of the hobby, and does it in depth. The most unusual feature is that free flight is treated with respect, as an honorable aspect of the hobby, not as a "steppingstone" to other things. You get the idea from the fact tht the sections about free flight are written by such British contest fliers as John O'Donnel, Martin Cowley, Martin Dilly, and Mike Fantham. (Americans aren't slighted; Dave Linstrum wrote a section on beginning models and Walt Schroder wrote the enthusiastic foreword.)

The book is impressively printed on slick paper, with extensive use of good color. The sketches are extemely well-done and deal with such matters as DT's, VIT's, and Nordic auto-rudder set-ups. There are 3-views, and even a few full-size plans of simple models to build, with photo sequences illustrating construction. This would be a good book to show to the interested beginner, but the expert will spend a lot of time browsing through it, too.

The *Encyclopedia of Model Aircraft* (edited by Vic Smeed) looks like a typical coffee table book, but cost me only $10.95 at B. Dalton's Booksellers. This is a national chain, so you should be able to find it. The publisher is Octopus Books Limited, 59 Grosvenor Street, London W1 England.

MYSTERY MODEL

This model was one of those that made the "big is beautiful" school of free flighters happy. Developed on the West Coast, this one was a real monster, spanning nearly 10 feet. The distinctive wing and stab planforms should give it away . . . just look for it on the cover of the magazine in which is appeared. Used a fiberglass rod as support for the fuselage, covered with silked stringers over formers. Wing used sliced ribs. If you think you've got it identified, send in your guess to the **RCMB** office to see if you win the subscription prize.

MODEL OF THE MONTH:

Dippity -Doo P-30, by Dick Williamson.

Bob Stalick saw Dick flying this model at our WMC Northwest Free Flight Champs this year. He was impressed by its good looks and excellent flying, so he contacted Dick for a 3-view, which is reprinted here from WMC *Patter.* The secret to the model's performance is its light weight. Power pattern is right or left, due to the minimal fin area. Dick suggests that a larger fin might make this better. If you like realistic-looking contest models (except for the lack of landing gear), this might be fun to try.●

Power Boats . . *Continued from page 27*

water ports up instead of down. Why?"

Let me answer your questions as you asked them. 1) You are absolutely right about moving the radio equipment as far ahead in the compartment as possible. The cowl has been redone by many people who have built the boat. 2) There shouldn't be any problem using the Masterod for steering in the manner you describe. 3) We began rotating the cooling heads on the K&B outboard so we could see if the engine was cooling while it was running. In that configuration, the circulated water shoots straight up and you can see if the cooling system is working. That's the only reason. I understand that the technical committee at the 1979 NAMBA Nats made those who had done this reverse the head or face disqualification for not running a stock engine. I don't see this as a violation of the "stock engine" rule, but then not everyone agrees with my view.

Keep the letters coming in and we'll keep trying to provide somewhat reasonable answers. ●

J-3 Cub . . . . . *Continued from page 37*

coarse sandpaper in order to increase the epoxy bond.

I am hopelessly addicted to plastic film iron-on finishes, and firmly believe they are a godsend to those of us who enjoy model airplanes but lack the dedication to produce a show-type finish. Monokote is my favorite brand of covering,

and yellow is my favorite color. Naturally, the Cub was finished in yellow Monokote with black DJ Multistripe for the lightning bolt trim and the Cub decals provided.

Balsarite is a pre-conditioner for film finishes. It seals the wood and reduces moisture absorption, provides better adhesion, and helps prevent fuel soaking. I used Balsarite for the first time on my preceding model, and was very impressed with the finished results. I am going to use it from now on. It is well worth the added effort and expense.

Monokoting the undercambered wing was a new challenge for my covering technique. I followed the suggestions contained in the finishing instructions. Start with the wing bottom by first sealing the Monokote around the edges, second seal to the front and rear spars, third seal to the rib bottoms, and then shrink the in-between areas. You must be careful during the final shrink, or the wing bottom may lose its undercambered shape if the covering pulls away from the spars and ribs. I believe that Balsarite was a big help in getting good adhesion to the spars and ribs.

A side-mounted engine is recommended, as it retains scale cylinder placement. I opted for an upright mount because if I side-mounted my O.S. Max .35 engine with stock O.S. muffler on the thrust line, the muffler would not clear the fuselage. I had to extend the engine compartment by 1/2 inch in order to accommodate a Kraft KM-30 engine mount and the O.S. .35 engine. A Pylon Brand RST-8 fuel tank was used with the fuel and vent lines entering the compartment inside the Kraft mounting ring. The 1/2-inch extension was necessary to provide access to and clearance for the fuel lines. I also had to substitute 1/4-inch balsa for the 1/2-inch balsa nose block material because of space limitations between the O.S. .35 carb and propeller.

Installing the R/C equipment was a new experience because of roominess. A four-year-old 4-channel Futaba FP-4EN system with S-6 servos was my choice for guidance. I prefer a three-abreast servo mount, so I made a servo tray out of 1/8 plywood. There is plenty of room under the gas tank for both battery (located as far forward as possible) and receiver. Sullivan Gold-N-Rods were used for rudder and elevator pushrods, and Du-Bro Engine Control flex cable completed the R/C installation.

I got lucky with the center of gravity. It checked out slightly ahead of the location shown on the plans.

The ultimate test of a model's design and your craftsmanship is its flyability. Perfect flying weather greeted us when we arrived at the club flying site on an October Sunday morning. Fellow club members inspected my handiwork as I unpacked and assembled the Cub. Wing struts were a new addition to my assembly routine. The usual preflight procedures indicated that all controls were working in the proper directions and correctly centered. In my excited state, I did forget to make a range check, but as it turned out, range was no problem.

Starting the brand new O.S. Max .35 was another skirmish in the never-ending battle between me and model engines. I decided early in my modeling activities to stick with one particular brand of engines. That brand is O.S. Max, and I have never regretted the choice. I also have resisted the temptation to own an electric starter because I consider it a sign of defeat in my battle, but I am not above borrowing one when the old arm starts to give out. Fortunately, I have been using muffler-equipped O.S. Max engines for several years, so the starting of this one went pretty smoothly. A nice rich setting for break-in purposes, and the Cub was ready to take to the air.

I had to abort the first takeoff because the tail immediately lifted off the ground and the model started ground looping. It was back to basic taildragger takeoff technique for the next try. I gradually advanced to the throttle while applying some up elevator as the model began its takeoff roll. This helps keep the tail wheel on the ground until the rudder's effectiveness is increased by the airflow over the control surfaces. Still, the Cub's tail came up and it literally jumped into the air after a takeoff run of about ten

feet. I needed to maintain continuous up elevator as she climbed to test altitude, because I had purposely put some permanent down trim into the elevator. Most of the models that I have flight tested wanted to climb with a neutral elevator setting. I feel more comfortable working with up elevator to maintain climb and level flight rather than giving down elevator to prevent a possible stall.

After up trim was added, the Cub proceeded to fly with the slow and reliable characteristics of its full-scale prototype. The rich engine setting pulled it through a pretty inside loop with the trailing vapor reminding me of generated smoke on a real aerobatic ship. I was reluctant to try a spin for the first few flights until the engine was broken in. Turns are really smooth for a three-channel rudder-equipped model. The two degree wing dihedral does result in turns just like an aileron trainer.

I asked fellow club member Bill Knorr to man my camera for some in-flight pictures of fly-bys. Our picture taking was interrupted by a couple of engine failures. I traced the problem to a vibrating needle valve, and fixed it by bending the needle valve spring clamp for a tighter grip.

This Cub is not an exact scale model, but neither does it require the work of a scale model. A building time of from 14 to 30 hours is estimated by the designer. The kit utilizes the techniques of trainer construction to give a realistic rendition of one of the world's most popular airplanes. It's special undercambered high-lift wing design gives the slow flying and excellent handling characteristics that make it a pleasure to fly. The two-degree wing dihedral option enhances the Cub's sport flying, while the six-degree option increases stability for use as a trainer. A strong, accurately aligned, and durable fuselage results from the self-jigged plywood construction. It is an ideal kit for an introduction to scale modeling, and when combined with its thorough instruction manual, it makes and excellent self-study course in model airplane construction.

We Cub lovers owe the people at M.E.N. our special thanks for providing us with a model in the simple and sturdy tradition of our patron saint. Its size offers good visibility to those of us who remember those early Cub days, and whose eyes are not as sharp as they used to be. If your early day memories included a yearning to be in the cockpit of a lone Cub as it passed overhead, you can relive those days while at the controls of your own M.E.N. J-3. •

Fuel Lines . . . *Continued from page 33*

5%, but the kerosene base remains.

As engine development proceeded through the '50s and '60s, the diesels vanished from the horsepower events. The FAI free flight power event was the last holdout, with the Czech team using MVVS diesels into the '70s. However, they didn't win.

New engines were mostly limited to the .15 in³ (2.5cc) displacement for the T/R event. The .21 (3.5cc) engine, of which there were several, went out of production. A variety of .049 to .09 size engines remained in production for the sport flier.

The "vanishing diesel" was the result of the engine market and the mechanics of engine development. First, except for 1/2A, glow engines in the '50s and early '60s were of the baffle piston variety. It is inconvenient to put a diesel contra piston in a baffle piston engine.

As I mentioned last time, the standard diesel design had an extended cylinder housing the contra piston, which was just a plug of cast iron. If the plug has a slot to clear the piston baffle it has to be keyed to the cylinder to positively align it. Can it be done? Sure, but it appeared to be more trouble than it was worth. There was just no strong reason to produce glow and diesel versions of the same engine. Both McCoy and OK Cub .049's were made with diesel heads which used O-ring seals. All had varying degrees of trouble caused by the O-rings (more about that in the future). Most importantly, none of the various McCoys or Cubs in glow or diesel form could compete with the Cox Thermal Hopper for power, so why bother?

In England and the rest of Europe, effort was put into building diesels, from the .009 Albon Bambi to a number of .21's. Virtually all had 360° porting, and I suspect that if a glow head were installed the power output would not have been impressive. So, from their manufacturer's standpoint, why bother with a glow version?

The only exception was the Supertigre .15, which utilized the Supertigre 2-window porting and a flat-top piston. Both glow and diesel versions were produced and both enjoyed considerable success . . . the glow in C/L speed and free flight and the diesel in FAI T/R. Even after the FAI speed and F/F power events limited glows to non-nitro fuel, the diesel couldn't beat the glow.

In 1974, Rossi put a diesel head on their extremely successful Schnuerle ported .15. Although it found a lot of use in the T/R event, neither the front or rear valve Rossi diesel proved to be a really good engine. It didn't lack power as much as range and steady running ability. One unanswered question is why the Rossi diesel was such a poor T/R engine. However, in all the engine running I've done, I'd never run a direct diesel/glow comparison on the Rossi R/C configuration. With all the diesel conversion publicity floating around today I thought it was time to try.

Instead of putting together whatever parts I had on the workbench, I convinced John Kilsdonk that he should lend me a Rossi that he had been using last summer in 1/4 Midget. He sent me one that he had used in most contests the past year, stating that he felt it was within about 300-500 rpm of the best

engines he'd seen on a test prop. Test rpm was about 23,000.

Now, the diesels have been traditionally known as low speed engines with lots of ability to swing big props. However, that is a holdover from the old days. Obviously, if the breathing ability of the Rossi is efficient (as a glow) at 23,000 rpm, just putting on a diesel head won't change that. In any event, I wasn't going to handicap the glow by making a comparison far below its best rpm.

For the glow portion of the test I mixed up some 15% nitro/10% Castor/10% Klotz fuel, hoping it would be representative of QM fuel. I also had some 50% Nitro/20% Klotz that I thought I might slip in somewhere. Neither is claimed to be a "best" fuel. I used what I had on hand.

On the 15% nitro the engine turned two of my test props at 21,600 and 24,000 respectively, these being with the stock Perry carb which has a throat diameter of about .200 inch.

When I had planned this test I thought I was going to demonstrate how even low nitro fuel in a glow would dust off a diesel. Now I was having my doubts, since I normally test run the N15D at over 20,000 rpm on the larger prop on a .128-inch T/R venturi.

Although I have made a number of all-aluminum head/contra piston set-ups for the Rossi, the last one had by this time found its way out the door. All I had on the workbench was a stock Rossi diesel head, which is not by any means a great design. However, its problems are more apparent in T/R use than in bench testing. The rpm readings using my standard running-in diesel fuel were 21,200 and 24,400.

Now, fully intrigued, I put in a stock Rossi FF/CL venturi which has a .220 dia. These were the results:

15% Nitro
- 22,300
- 26,600

50% Nitro
- 24,000
- 27,400

Diesel
- 21,800
- 25,800

Well, those are the numbers. Here are my conclusions:

1) If you're willing to pour in nitro, you'll go faster. A winning C/L Goodyear engine on 50% nitro should turn the larger prop well over 25,000 rpm. In a "go-fast" event with no nitro limit, the diesel is outgunned.

2) If nitro content is limited to "sport fuel" levels the average Rossi glow will develop about the same power if converted to diesel.

Since diesels aren't allowed in 1/4 Midget and the Rossi R/C is not really considered as an average R/C engine, can the above be extrapolated to other engines? Even if it can, is a diesel conversion a good choice for everyone?

My answer to the first is: I don't know. I suspect that the diesel compares less favorably on peak power as the engine increases in size. However, I'll hold an open mind.

My answer to the second is a firm no. Everyone's requirements are just too varied for a blanket conversion to diesel, and probably the best reason is in the words "conversion to diesel."

If I were building a small sport free flight or free flight scale plane I'd pick a small diesel. Why? Simplicity. I could go out to fly with no more equipment than a small can of fuel.

What does a weekend R/C'er save? Not much. He probably has a tool box full of equipment and may well have a glow driver hooked up to his starter battery. Having no glow plug in the engine doesn't simplify his life.

Worse yet, he has to replace his engine's head, learn what the compression screw does, and has to replace all the natural or silicone rubber in his fuel system. Finally, he probably has to scratch around and buy some diesel fuel at the retail price instead of using the club fuel at $6 per gallon. All this to cut his fuel consumption in half and eliminate his glow plug bill.

I hope I'm not misunderstood. There is a good case for general use of diesels. However, the glow engine has developed its supporting institutions which are non-existent for the diesel. For the present the diesel user will have to be more self-reliant, and I'll try to provide some help in that direction next month. •

Charlie . . . . . *Continued from page 25*

bit and mention that without the illustrated *component identification and installation* sheet attached to the instruction sheets, these components would be difficult for the neophyte to identify. This page bears very careful scrutiny since it clearly identifies all of the components you will find in the kit, and more importantly, tells you how to read, for example, the color code bands on each resistor.

The receiver was not particularly difficult to fabricate, however, some of the components, such as the choke assembly and the antenna and mixer coils, required an extra degree of care in assembly. By now, I realized the wisdom of requiring assembly of the servos first, with their relative simplicity, which adequately prepares the newcomer for the more difficult tasks required to build the receiver. Again, careful attention to the instructions is an absolute must. I was particularly careful in the bending of the tabs and wires flush against the backside of the P.C. boards prior to soldering, to assure there was no chance of a short circuit between conductor strips. P.C. board cleanliness prior to soldering the components helps guarantee there will be no "cold" solder joints. By the time you get to the receiver, your soldering techniques should be near perfection, with nice shiny joints void of excess solder. (Mine are *almost* perfect.)

TRANSMITTER

Being a self-perceived "expert" by now, I could hardly wait to get my hands on the transmitter kit, as I'm basically a mechanic anyway and this looked like (and was) a fun project. Since the pre-tuned R.F. section is pre-assembled by the factory (only a holder of a first or second class commercial license may legally tune the R.F. section) the assembly of the rest of the P.C. board is straightforward, with little difficulty.

Mechanical assembly of the transmitter is no sweat (follow the instructions, dummy) and the Dunham 2-axis stick assemblies go together without problems; a nice piece of engineering in this department. The wire harness to each of the stick assemblies is already cut to *exact length* to allow for movement without mechanical interference. Even so, these dimensions are carefully set forth in the instruction manual. I did have to drill a one-quarter inch hole in the top corner of the transmitter case to accommodate the fifth channel retract switch and two smaller holes to mount the charge receptacle for the nickel-cadmium transmitter batteries. This battery pack was assembled and encased within a neat plastic container that typically nests within the bottom of the transmitter housing. Wire ties were used as recommended to complete the transmitter assembly process. Let me tell you, this "dynamite" little transmitter is small when compared to other systems on the market. However, I find it lays in the hands quite comfortably and the stick assemblies are very smooth, with the right amount of "feel" for effortless and effective operation.

The remaining tasks included fabrication of the switch harness, the flight system Ni-Cd battery pack and assembly of the dual charger system (if you can call soldering on a couple of plugs an "assembly" process).

Now comes the fun! Here I am with a transmitter, a receiver, and four servos . . . all out of tune. Fortunately, there is one constant; that previously mentioned factory preassembled and calibrated servo. By closely following the carefully worded instructions, step-by-step, that calibrated servo provides the means of aligning the system so it works just like a factory-tuned radio. Each channel is manually aligned by adjusting the trim pots on the stick units, and a trim pot on the circuit board. No instrumentation is required! If you are capable, however, and can beg, borrow, and/or use your own oscilloscope, clear instructions are also given for instrumented logic calibration.

I wish I could say that I performed the transmitter logic calibration myself, but I didn't. Since I live within driving distance of the Cannon factory, I took advantage of the situation and hand-delivered the system to the factory for calibration. Since I'm basically an insecure person, I was greatly relieved when Charlie's technician didn't immediately "trash can" my efforts upon first system inspection! These capable people soon had my system nicely calibrated, inspected and "stamped" with approval.

They sent me on my way a happy man. I had actually built my own radio control system!

The system has since been flown in slope gliders for many solid, trouble-free hours. Recently, my son, Steve, flew the system in a small Cox-powered aircraft with no problems of any sort.

Any dedicated R/C modeler should give serious consideration to building one of Charlie's Radio Control Systems. A better understanding and appreciation of the radio systems most of us take for granted will be an obvious result.

The electrical engineer or electronic technician who builds this system will take advantage of the schematics provided and for those who possess an oscilloscope, sequential waveform pictures illustrate what these waveforms should look like at various checkpoints in the circuit. To reiterate, the instruction sheets provided are well done and complete, both for the amateurs and professional alike.

To sum up, building Charlie's 5-channel Deluxe Mini-Sport Model radio system has been a rewarding and educational experience for me.

The system has performed flawlessly to date and the small size of the transmitter (1-11/16x4-13/16x5-5/16 inches) is a pure delight! It is so small and light you barely know you have the transmitter in your hands while flying the system.

Do yourself a favor. Build one of

Charlie's kits and enjoy a new facet in the sport of Radio Control modeling. •

Plug Sparks . . . *Continued from page 41*

Feb. 23-24 . . SAM 25 Las Vegas Annual
March 15-16 . . . . . SCIFS Kick-Off, Taft
April 13. . . . . SCAMPS Texaco, Taft
May 24,25,26 . . . . . USFF Champs, Taft
June 22 . SCAMPS ROW, Lake Elsinore
June 29 . . . . . SCIFS, Taft
August 17 . . SCAMPS Ohlsson 23 only, Lake Elsinore
Sept. 14. . . . . SCAMPS Rubber, Mile Square
Oct. 4-5 . . . . . SCIFS Texaco, Taft
Nov. 15-16 . . . . . SCAMPS Annual, Taft

Jim Adams informs this writer that the schedule is pretty well graven in stone, but there may be a few more miscellaneous meets to be announced, such as another VAMPS contest, SAM 31 (Phoenix), and the San Diego boys haven't been heard from as of this writing. Main idea is to keep this schedule handy, as it represents all major Old Timer contests in California (with apologies to the VAMPS).

BIPLANE-ITIS

Gordon Codding of Kingman, Arizona has come up with the neatest idea in Old Timers yet. He has been taking standard designs such as the Miss Tiny or Ohlsson Pacemaker and adding a lower wing to them. The net result is some of the neatest looking biplanes you would ever want to see. Even without struts, they have a Waco biplane look about them.

In that same line, this may be the very thing to revive the SCAMPS Old Ruler event, a good idea that went nowhere. The Old Ruler event was intended for those modelers who wanted to design their own models that conformed to the F/F rules of 1940. Unfortunately, this one-shot type of contest failed, as most fellows don't have the time to build specialty models for a once-a-year contest.

The whole thing really went down the tubes when regular Old Timers such as Comet Clippers were allowed to enter this event with the flimsiest of modifications. The idea here was to encourage entries, but in fact did nothing other than create another duplicate event to try your luck in.

This latest idea of making biplanes out of monoplanes may be the answer. Codding claims they fly much slower and much more realistically. After all, isn't that what we are all in this Old Timer game for? A few of the SAM chapters that sponsor or have sponsored this event might do well to take a good look at this latest idea.

VAMPS ANNUAL 1980

Although we didn't plug this contest last year (due to late notice), this is a two-day meet every fun modeler should attend. This year will find the VAMPS Annual being staged on February 23 and 24 at Henderson, Nevada.

One of the more interesting gimmicks employed by this club is that you may fly any event on either day. This makes for very interesting sandbagging! The only exception to this rule is the Texaco event, which will be staged on Sunday only. Other events will be Class A-B Cabin, Class A-B Pylon, C Cabin, C Pylon, 30 Sec. Antique, .020 Replica, and O.T. Scale. You all come out, ya hear!

F.L.A.S.H.

That's an acronym, man, in case you didn't recognize it: **FL**orida **A**sks for **S**ome **H**elp. Yep, it's true! Ivan Tarbert, a banished Californian now located at Lake of the Woods, 437 Meadowood Blvd., Fern Park, FL 32730, is asking for all interested R/C Old Timer fliers to drop him a line. Ivan wants to organize some Old Timer radio control activity. After all the meets in California, Ivan literally is

dying on the vine! All right, you guys, you know the problem. Let's write!

HURIOT SPORTS

Just received a nice letter from Bob "Bucky" Walter, who explains that HURIOT is an abbreviation for Huron, Erie, and Ottawa counties, all located on the southwest shores of Lake Erie.

SAM 39 members are desirous of increasing their membership, and they know darn well there are a lot of modelers out there who simply don't know about the existence of the Huriot R/C Sport Flyers (SAM 39). Those interested in getting into the O.T. fun, contact: Ralph Turner, 35283 Keller Dr., Avon, OH 44011, (216) 937-6884.

The Huriot O.T. meet, which should more appropriately be named the "Hot-dogfest," came off on October 21 at the NASA Plum Brook Station located in Sandusky, Ohio. Weather consisted of clear skies, 80 degree temperatures . . . and unbearable high winds. With such weather it indeed took a stout man to fly. Bucky points out the results of the contest were five cases of near heart failure on the part of the pilots, while 32 onlookers clapped, cheered and even prayed.

Although it was windy, it still was a great day for FUN. An even better social event was held which included hangar flying about the Old Timer planes. The boys were fortunate to have Chet Lanzo and Joe Elgin on hand. This, in itself, made the whole day worthwhile.

Among the more important results of this bash was the Eating event, which showed the consuming of seven pounds of hot dogs, two gallons of lemonade, one gallon of iced tea, and 75 cups of coffee.

Probably the biggest attraction of the meet was Will Schachtel's giant 12-foot Playboy. In that heavy wind, it took four guys to keep the model from maxing out from a dead start. Joe Elgin sure got a kick out of the huge Playboy.

Latest dope from the Huriot club is that Chet Lanzo wanted to donate his 1937 R/C Nats Trophy to the club as a perpetual trophy. Although the Huriot boys realized this was quite an honor, they felt Chet should give it to the National SAM organization for a perpetual trophy. This columnist thinks it would make a dandy perpetual trophy for the Texaco event. Could call it the Lanzo Texaco Perpetual Trophy. How about that, men? More dope on this in a future SAM Speaks issue.

WASHINGTON CALLING

No, not Washington, D.C., but SAM 8 of Washington, whose members enjoy meeting at the Boeing Aircraft Recreation Center. Their latest idea is worth noting and possibly being taken up by other SAM Chapters.

SAM 8 has started a trophy called the "Dick Lee Old Timer of the Year Award." The rules provide that selection should

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be made on the basis of sportsmanship, dedication to the principles and sport of Old Time modeling, and promotion of the sport in their area. To be eligible to vote and possibly receive the award, you must be a member of SAM 8 in good standing. The award is not for the best flier or the prettiest airplanes, but for the person who has helped others, promoted the activities of SAM, and has shown a real dedication to our O.T. hobby.

Now how about that? Isn't this what the Old Timers is all about? Due credit should be given to Dick Lee, who thought up the idea but has sponsored the award out of his own pocket. It's things like this that are the secret of SAM's endurance and growth!

THE FUN CLUB

No question about it, SAM chapter 30 is the most fun-oriented club this columnist has run into. Their Annual is always the best to go to, as they now have the use of the finest flying field these eyes have ever beheld! Imagine flying off forty acres of dichondra!! Better than a golfing green!

In addition, the barbecue feed (generally held at 2 p.m.) is the show stopper of all. The food gets better, more plentiful, and greater in variety every year. Seems like every modeling wife has to put her share in. Net result, more darn spectators (and hungry ones too!) than you would ever expect at a contest of this sort.

The Team Texaco event is the big draw here. All local SAM chapters are represented here (21, 27 and 30). Rules are quite simple: Three-man teams, each man gets one flight. The event is run Texaco style except no gas is dispensed, only a two-minute motor run. This type of event promotes real teamwork and adds to the general fun. You have competition but not that gotta-win attitude you find in the standard events. For the first time, the club (SAM 30) that claims they try harder because "we're always second," came away with the prize. It's great to have fun and win too!

Three other events were staged during the day, with Don Bekins winning Limited Engine Run, Bob Hughes the Antique event, and Nick Sanford the heavily entered Texaco event.

SAM 30 should be commended for putting on a super meet and all-around good time. Hal Cullens, the spark plug, secretary, newsletter editor and Contest Director showed how to get things done. He had a loudspeaker system, sign-up tents, and shelter for the boys, as it did rain in California that day!

SAM 30 has earned such an enviable reputation for putting on meets that they will host the West Coast R/C SAM Champs on Memorial Day at this remarkable field. Paste that date in your hat!

SCAMPS ANNUAL

We have been trying to hold down contest reports, but Jim Adams sent in such a neat report on the SCAMPS Annual that we couldn't resist reporting same. As Jim says, in spite of indifferent weather, the meet was well attended. Some small showers and wind on Saturday failed to dampen the modelers' enthusiasm.

Probably the most interesting facet to develop at this meet was the entries in the Rubber event. With the advent of good rubber (well, reliable at least!), the

interest in flying rubber-powered models has shown a marked increase. In this event, no one particular model design stood out, as each contestant had a different design. This is to be greatly desired, a difference of opinion leading to a good competitive event.

Adams also reports that for the first time in his flying Old Timer models, he finally saw a Spook 48 win the Class B event. Al Heinrich wasn't kidding when he said he had a performer! Also noted was Bob Oslan with a Pete Bowers Fly Baby. This excellent looking model flew just as good as it looked. The only reason this model has not placed more lately in that it was in the "lost" category for quite some time. Look out from now on!

Talk about a Strato Streak syndrome in the .020 Replica event . . . Strato Streaks took five places out of the first eight entries. The other places were taken by Playboys. Almost like the Class C Pylon event: if you don't have a Comet Sailplane you are in trouble! The Class A and B events were dominated by Rangers and Zippers. One oddball, a Snuffy 6, placed in Class A Pylon.

An interesting ruling came up at this meet, in that the original 1938 Zipper (sometimes known as the Gas Bird) was not allowed in the Antique events but was flown only in the Old Timer classes. This was in deference to the intent of the SAM rules and Preamble. However, unless a definite rule is approved by the SAM membership and/or chapters, this action may lead to hard feelings. Definition is needed!

SERMON ON THE MOUNT

Ever so often this columnist feels that something should be said of how events and contests go to the dogs for lack of participants. Statements such as "free flight is dying" and "radio control is becoming a one-design event" are a result of allowing the hotshot fliers to amend the rules to suit their purposes. It is a fact of life that if the blood-and-guts boys can't win all the time, there must be something wrong with the rules and therefore need changing.

This has been brought out rather forcibly in an editorial by that incomparable writer of irony, Ken Sykora, SCIFS newsletter editor. In his editorial, Ken notes the same thing that has plagued all events. He states that the low-keyed, fun type events, after they have been on the calendar for awhile, suffer from the blood-and-guts type of fliers. These sort out the best possible design, work any possible angle on the rules, and then make a personal crusade out of winning every time.

In the course of this process a predictable phenomenon occurs. A day comes when two or three of these serious guys show up at a meet (to "pick off" this event) and they are the *only entrants*. The other fliers have taken their business elsewhere. (Maybe looking for more fun and a little less predictability?)

Stage Two: The clubs can't continue to support events for two or three contestants. The event is dropped. Everyone loses.

Ken Sykora points out such is the case of .020 Replica, one of the most popular events ever to develop in the Old Timer movement. Entries ran as high as 85 at the SAM Champs. Slowly, the lesser performance ships disappeared, leaving only a few hot designs such as the Strato Streak. If you can bring it in at two or three ounces (or less!) with a hot engine it is almost out of sight on the power run alone. So, it is a quick three-max flight before breakfast, add two or three for insurance, and the event is over for all practical purposes by 9:30. Ho hum! Is it no wonder there is no waiting line to enter?

Ken feels the answer is small field contests with events tailored for a little fun and excitement. However, in this columnist's opinion, this does not prevent the hotshots from ruining these events.

The phenomenon of only a few models surviving a grueling contest reminds one of Darwin's theory; only the best of the species survive, and so it is with models. It is the contention of this columnist that designs should be handicapped in direct proportion to the number of wins they register. If you just took 2% off the total time of a particular design every time it won, in less than a year, the other less-competitive designs would start showing up.

Of course, this requires quite a bit of bookkeeping, but when analyzed on the basis of a year's results, it certainly doesn't take the most obtuse of modelers very long to count up the number of wins by any particular series of designs. Furthermore, it is most simple to impose a handicap on that particular design. Guess what? We'd start seeing something besides Zippers, Sailplanes, Playboys, and Strato Streaks in the pylon event. Same thing for the cabin event. Well, whadya think, men? Is this a way of recapturing some of the fun that is disappearing from O.T. competition? •

Counter . . . . . *Continued from page 8*

intended especially for iron-on plastic coverings, and so no compound contours are used in the design (this is supposed to be a beginner's model, remember). But the most intriguing part about the Cobra is the wing construction, which makes use of ribs, a 1/4-inch dowel l.e., and a pre-shaped t.e. (and at least one spar, we hope). No dihedral braces, wing sheeting, or reinforcing tape is used. This no doubt makes for

"...a truly simple wing that takes less time to build than it takes to cover it," as the news release states, but where does the strength come from? It's a real head-scratcher. Other kit features include all pre-cut parts, exclusive "Jemloc" fuselage construction, instructions consisting of artist illustrations (said to be easier to follow than photographs), all hardware, and a clear plastic canopy. Retail price is $44.95.

You can find out more from Jemco, 1305 Foothill Dr., Vista, CA 92083.

* * *

Power fliers who have been having trouble getting their particular engine/carb/tank set-ups to run correctly with the Robart Super Pumper Mk. II, or who find that the Mk. II adjustment is extremely critical with their particular engine/carb/tank installation, should get one of the new Robart Auto Mix devices. This clever gizmo requires no adjustment, and once installed in your fuel system, the Mk. II Super Pumper need only be adjusted to deliver more fuel than the engine demands, the excess fuel being automatically returned to the tank by the Auto Mix. A neat idea, no? The Auto Mix works with all displacement type fuel pumps and sounds like it's well worth the asking price of $9.95.

The new Robart Super Pumper Mk. IV is a Super Pumper and Auto Mix combined into a single package. This ought to be just the thing for tight cowling situations, and it also reduces the amount of plumbing in the engine compartment, as compared to the Super Pumper Mk. II/Auto Mix combination. The Mk. IV Pumper sells for $24.95.

For more information, write to Robart, 310 N. 5th St., St. Charles, IL 60174.

* * *

A company new to the modeling industry is American Marketing Inc., and its first offering is a handy little item billed as the "Clean Machine." It's a small ultrasonic cleaner that all modelers should find extremely useful. If you've never used one of these types of cleaners before, you're really missing the boat when it comes to getting your engines, timers, or any other precision piece of equipment *really clean*. The Clean Machine will remove everything from the smallest particles of grit to hard-to-clean tarnish on engine parts, and if the cleaning solution supplied doesn't do the job, a stronger one can be substituted. The plastic cleaning basin is impervious to just about any kind of cleaner you'd want to use on metal parts, so there's not much chance of having to stand helplessly by while your new ultrasonic cleaner dissolves in front of your very eyes, on account of a too-strong cleaning solution. Oh yes, the unit operates on 110 volts A.C.

At present the Clean Machine is available only direct from American Marketing Inc., P.O. Box 4011 Terminal Annex, Los Angeles, CA 90054. Retail price is $29.95, plus $1.50 postage. California residents be sure to add on that 6% sales tax. •

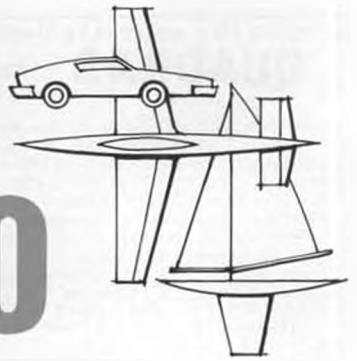
Workbench . . . *Continued from page 6*

UNDER COVER

Progress always has its drawbacks: the traffic jam-relieving freeway that cuts across beautiful meadows, the tearing down of historic buildings for shopping centers and parking lots, automatic transmissions that don't know how to behave in snow, and **R/C Model Builder** tripling its circulation but no longer being mailed in an envelope. . .

Well, the latter example certainly doesn't carry the impact of the others, but to those who like to save model magazines, and we've been one of 'em since around 1935, the loss of the "good-guys" white protective envelope as of last June, has been somewhat of a shock. After searching in vain for a way to protect the magazine during mailing without adding to the cost of production, we have finally arranged with our printer to provide envelope mailing for those who are willing to pay a slight additional cost . . . 25 cents per copy, or $3 per year. For a new subscriber, or one who is renewing, it's easy; just add $3 per year to the subscription rate. For an existing subscriber who wishes to have the mailing envelope, it's a little more complicated . . . how many months to pay for? Count the number of months from the time you order the envelope to the expiration date shown on your address sticker, subtract one, and multiply by 25 cents. Example: if you order the

WRAM SHOW '80



Westchester County Center, White Plains, New York
Don't miss our 12th annual show. It'll be the biggest and best ever!

Keep that last weekend in February open...the 1980 WRAM's Show is going to be the largest yet. Well over 150 manufacturers and other exhibitors have already signed up to bring you everything that's new in the hobby...kits, engines, radios, accessories and everything in between. And, our famous Swap Shop will be in full operation with thousands of items, including built-up planes, almost new radios, engines and on and on and on with something for just about everyone.

Static Competition
Make sure your latest creation is finished up and polished so you'll have a chance to take home one of the dozens of trophies to be offered in these events:

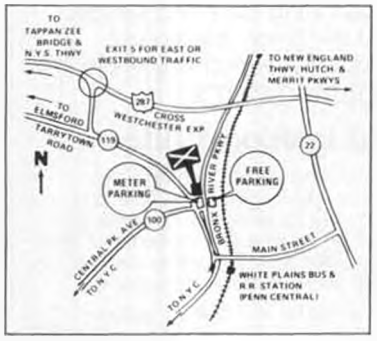
WW I
POST WW I (Military)
POST WW I (Non-Military)
PATTERN
SPORT BIPLANE
OLD TIMERS
SPORT
PYLON
GLIDERS
HELICOPTERS
SCALE R/C BOATS
RACING R/C BOATS
STAND-OFF SCALE
JUNIOR EVENTS
R/C CARS
BEST IN SHOW

Judging takes place Sunday afternoon. Entries accepted until 12 Noon Sunday

SWAP SHOP
The WRAM's Swap Shop has become one of the major show attractions with thousands of individual items changing hands. To help eliminate "registration crush", the 1980 Swap Shop will have a special pre-registration line for those who have completed a pre-registration form. To receive these forms send a *self-addressed stamped* envelope to:
John Isbister, 4 Devon Rd.
Larchmont, N.Y. 10528

SPECIAL NOTE
Because of the increased volume of items being brought to the Swap Shop, combined with space limitations, only one built-up model will be accepted from each Swap Shop registrant.

For further information, write to Larry DiRubbo, 167 Lindsey Ave., Buchanan, N.Y. 10511, (914) 739-2827



WESTCHESTER RADIO AEROMODELERS, INC.

February 23/24

10 A.M. to 6 P.M.

The Westchester County Center is centrally located in the city of White Plains, N.Y., at the intersection of Rt. 119, Central Park Ave., and the Bronx River Parkway. White Plains is just 22 miles north of N.Y.C.

envelopes in March, 1980, and your subscription expires in November, 1980, that's 7 times .25, or $1.75.

We're sorry to have to pass the envelope expense on to you, but that's . . . uh, progress.

SLOPE PYLON RACE

This year, **RCMB** joins the Torrey Pines Gulls in sponsoring the Second Annual T.P.G. Pylon Racing Championships, at Torrey Pines, just above Black's Beach, La Jolla, California, on March 1 and 2, 1980.

Sailplanes must comply with the FAI F-3B rules and regulations in order to compete in this AMA sanctioned event. Maximum wing loading is 23 oz./sq. ft., and maximum weight is 11 pounds. Weather permitting, there will be seven 6-plane heats, with the finish at cliff level. This will protect the nude sunbathers on Black's Beach, 300 feet below the Torrey Pines slope site, overlooking the Pacific Ocean. Be sure to bring your binoculars and telephoto lenses . . . to follow and photograph the gliders, of course.

Trophies will be presented at a barbecue following the race on Sunday. In addition to trophies, the first place winner will also receive a Bob Smith R/C Aircraft "Seabreeze" and the second place winner a Marks Models "Bird of Time."

Entry fee for the two-day contest is $10, and must be received by the T.P.G. not later than February 28, 1980. For further information and entry blanks, contact Rick Schrameck, 1705 Gascony Road, Leucadia, CA 92024, phone (714) 942-0571.

Come on out for the race . . . and test your concentration!

SYNCHROGYRO GEARS

Thanks to John Bell, of Port Charlotte, Florida, the problem of finding bevel gears for the twin-rotor R/C autogyro published in our September '79 issue has been solved. Check this month's "R/C World" for more information. •

KIWI

RC SPORT PATTERN FLIER

Designed by HANK POHLMANN

KIT NO. RC-42

$47.50

KIT FEATURES:

- Built-up Wing
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- Sheet Balsa Tail Surfaces
- Shaped Balsa, Ply and Hardwood Parts
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- Coil Spring Nose Gear
- Nylon Nose Gear Bearing and Steering Arm
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- Wire Aileron Torque Rods
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- Full Size Plan
- Illustrated Instruction Book

The strong, simple construction of this low-wing sportster gets you into the air fast and keeps you there for many a flying session. Lots of room in the fuselage for easy mounting of almost any kind of RC equipment. The large area control surfaces give sensitive maneuvering response for fast action in fun-fly competition. Or you can reduce the movement and cruise around in a relaxed and easy manner. Check that list of features!

WINGSPAN: 54"
SUGGESTED ENGINES: .35 - .45
SUGGESTED RADIO: 4 CHANNEL

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LC-004 Pint $3.25
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LC-006 Gallon $13.95

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Dark Blue	Dark Green	Brite Gold
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4 Ounce Thinner . . . $ .89

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8 Ounce Color $2.25
8 Ounce Thinner . . . $1.49

Pint Clear $3.25
Pint Color $3.49
Pint Thinner $2.25

Quart Clear $5.25
Quart Color $6.25
Quart Thinner $3.39

Gallon Clear $13.95
Gallon Color $15.50
Gallon Thinner . . . . . $ 8.95

SUGGESTIONS FROM THE SIG FACTORY FLIERS ABOUT FINISHING WITH SIG DOPES

To prevent warps and excessive pull down of planked areas, Sig Supercoat Color Dope and Lite-Coat Clear are made with a low shrink base. They should be used on open framework covering only after the required amount of covering shrinkage has been obtained with one or more coats of Supercoat Clear Dope, which is in a shrinking type base. Use Lite-Coat as the only clear dope on rubber powered and other small models. Solid sheet balsa or sheet balsa covered models, whether covered with paper, silk, or not, can use Lite-Coat as the only clear dope. (From this point we will refer to clear dope, which can be either regular or Lite-Coat, depending on whether you need shrinkage or no shrinkage.) Covering all exposed wood with silk, silkspan or similar material is recommended to strengthen the wood and prevent splitting and cracking. The covering makes an ideal base for a finish.

To prepare a balsa framework, either open or planked, for covering, apply two coats of clear dope to the wood surfaces. Sand lightly after each coat is dry to remove any raised grain or fuzz. The bottom of the wing is a good place to start covering. Cut a piece of material about 1" larger than half of the wing with the grain running lengthwise. Dip in water and apply. Work around the edges, pulling out all of the wrinkles and stretching it smooth. Brush around the outside edge with clear dope. It will soak through the covering and adhere to the dope already on the structure. After drying, trim off the edges with a sharp, double-edged razor blade. Go over any edges that have not adhered with more dope. The top half is done in the same fashion except that the covering should be brought down over the edge and lapped over the material on the bottom of the leading edge and over the back of the trailing edge. Other parts of the model are covered in similar fashion. Brush on two or more coats of clear dope to fill the grain and/or obtain desired shrinkage.

For a prize winning finish, Sig Sanding Sealer may be used to fill the grain further and provide a base for color dope. Sand between coats with 220 to 360 Tri-M-Ite Finishing Paper. Remove as much as possible of the sealer in the sanding process, but be careful not to cut into the covering material. Two coats of Sealer are generally enough. Apply a coat of clear before color doping. It is possible to use all clear dope as a base for color without using Sanding Sealer. Clear can also be sanded between coats.

Supercoat Color Dope should be thinned with 10% or more Supercoat Thinner for brushing. This helps prevent brush marks and gives smoother coats. Flow on wet coats and avoid rebrushing back over an area already painted. For spraying, thin dope about 50 - 50. Add more thinner if the dope does not go on evenly.

Sig Retarder can be used in place of part of the Supercoat Thinner when the humidity and/or temperature is high. The Retarder slows down drying action and prevents "Blushing" or turning white. It also helps in spray mixes when "orange-peel" surfaces result from the dope drying in the air on the way to the part.

Painting the entire model white is recommended for a good color base, particularly when white is part of the color scheme. Color coats can be sanded with 360 Tri-M-Ite or 400 or finer wet paper. When using masking tape for trimming, seal the edge with a coat of clear dope to prevent the color dope from bleeding under the edge. Don't leave the masking tape on any longer than necessary. The longer it is on, the harder it sticks. Complete the job with several sprayed coats of clear over the color scheme. This seals the colors and adds gloss. For a smooth, realistic finish the final coat may be rubbed down with Sig Rubbing Compound. After applying the decals, protect them and the finish with wax. For best results, it is not a good idea to try to mix different brands of paint. Use SIG products from the start.

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OS

4-CYC. 60 TUG BOAT ENGINE

OS

4-CYCLE MARINE

Here is a new OS four cycle engine that is sure to excite many scale boat modellers. These smooth running, quiet four cycle engines may be just the ticket for your tug boat or your river boat project. The engine is complete as shown in the above photo. Not shown but included is the drive shaft side of the universal plus several wrenches. The usual racing marine 60 is for very high RPM operations. This engine is for lower RPM, high torque requirements. A four to five foot boat would seem about right, something like the Halter American Enterprise at 52½" or the Dumas Dauntless at 49½".

Suggested Retail – $259.95

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