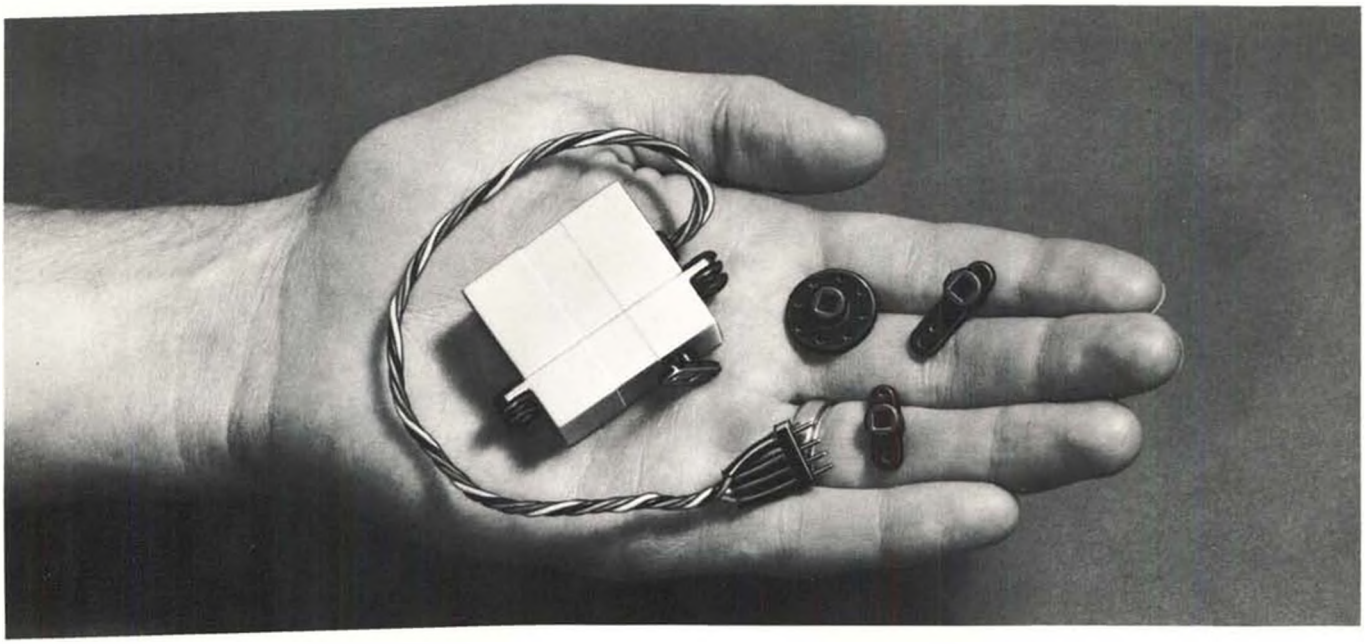
The MODEL BUILDER

JANUARY

50 cents

volume 2, number 4



1¼ ounces, 3-pound punch!

New Heathkit Sub-Miniature Digital Proportional Servo utilizes an integrated circuit to trim off excess bulk. The Sub-Mini weighs-in at 1.25 oz., measures 1⅞" from mounting ear to mounting ear, yet provides the same 3-lb. thrust of much larger servos. Features include 90° rotation in 0.5 seconds; 1% position accuracy; ceramic variable control feedback element; nylon gears and molded nylon case. Just 18 components install quickly on printed circuit board. Includes 4 rotary outputs, is compatible with all Heath R/C Systems and most others. Measures 1$^{11}/_{32}$" H x $^{23}/_{32}$" W x 1⅞" L.
Kit GDA-19-42, 1 lb. **24.95***

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Kit GDA-19-41, 1 lb. **24.95***

Heathkit 5-Channel Systems include 4 servos; Heathkit Miniaturized Receiver; Slim Line Transmitter with Kraft sticks, built-in charging circuit; flat-pack nickel cadmium batteries & free soldering iron. Specify frequency desired.
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Kit GD-69, 2 lbs. **19.95***

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from Bill Northrop's workbench . . .

WHAT'S IN A NAME?

Electronically, radio control has pretty much narrowed itself down in the past few years to two basic methods of control. One is the exotic and expensive digital feedback system, usually in the form of a two stick, four control unit . . . the other is the much simpler, less expensive pulse proportional system, mostly limited to rudder-only control. The latter is not as well publicized, mostly because it is not adapted to any of the competition categories presently established on a national basis in AMA. This does not mean that single channel is getting short changed . . . it is simply that for the most part, single channel is enjoyed by a large segment of modelers who don't give one hoot about competition.

We'd like to try to clear up one misconception about s/c that probably causes many modelers to look down their noses at it. S/c is not really radio control as we most commonly know it today. It really relates back to the early days of radio control when the models used were basically free flight and a rudder controlling device was employed to interrupt the model's otherwise natural flight as determined by preset trim adjustments. In those days, the successful R/C flier carefully trimmed his plane for free flying and then tacked on the radio as a means of keeping the plane in the same county, maybe even the same field. If the radio happened not to work, the plane just kept on flying, much as it did before the owner stuffed it full of wires, tubes, relays, batteries and other junk.

As radio systems improved and became capable of more control, the airplanes became less and less inherently stable, in many cases by necessity, since the radio could now do what the plane used to have to do by itself . . . maintain smooth and steady flight. If the plane is too stable by itself, it becomes difficult for the radio control to overcome the stability in order to perform certain maneuvers.

OK, so now back to single channel. Here it is, still a radio control system, but now under the new concept of "let the radio do it," the uninformed modeler figures that if it's a radio it'll control his airplane . . period . . exclamation point. And so he saddles the single channel to some bomb that probably needs all the help it can get from at least a 4 channel propo system, and expects it to do the job . . . . No way!

We feel this is the crux of the problem with single channel today. Most of the modelers who are getting negative results are using airplanes that are not suited to single channel use. Some R/Cers, who have never cut their teeth

The MODEL BUILDER

January 1972 volume 2, number 4

Cover: The all-time symbol of model aircraft. . . .the sun shining through clear doped silk and tissue, displaying the framework as though it were drawn on the sky... Hal Cover's "Lanzo" Puss Moth, a construction feature in this January issue.

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on free flight, think that the letters "CG" on a drawing mean that Carl Goldberg has put his stamp of approval on that portion of the airplane. Trim to them is a white stripe down the side of the fuselage, and because they do not understand that a stable airplane is required, the radio usually catches the blame for their failure.

To help cure the misunderstanding about single channel, we're in favor of calling it "Radio Guided Free Flight." The name tells it like it is, and maybe understanding it will be to enjoy it.

We have some projects under way which will make proper use of "Guided Free-Flight" systems. To the newcomer, GFF is a satisfying and economical way to get into R/C; to the old-timer, it is a relaxing change of pace from the all-out, concentration-demanding, expensive, and rather tense rigors of multi.

WHO'S WHO?

If you should happen to take a look in the index, you'll find some new names therein, starting this month . . . come to think of it, starting this *year*!

The names are those of contributing editors who will be handling their particular section or department on a regular, monthly basis. First, the "veterans" of this, their second appearance in the magazine; Le Gray, who will be reporting on R/C Soaring activities, and particularly on design concepts, investigation of theories, and construction methods; and Mel Schmidt, whose January effort includes an excellent construction article on a Gung-Ho competition free flight design, the SHOCer. It goes without saying (well, not now, I guess) that Mel's department is free flight.

Latest Jack Stafford kit, available in late January, is the Weekender. It has completely finished, balsa-on-foam wing panels, 1/4 inch sheet fuselage, 3/8 inch tail surfaces, weighs 6 pounds, uses 45 to 60 engines. Thick 800 sq. in. wing makes plane an excellent sport-pattern-trainer. $39.95

Before going on, one thing should be clarified. Mel really knows how to spell "Shocker", but you've got to look at it this way . . . . his free flight club is the Sky Hoppers of Orange County (California). SHOC club, get it? So quite naturally, his new design, having been named after the club . . . . and the fact that he didn't capitalize the 'h', 'o', and 'c', ends up as "Shocer". We were merely trying to protect his credibility as a writer by spelling it "SHOC . . . ." Oh well, skip it!

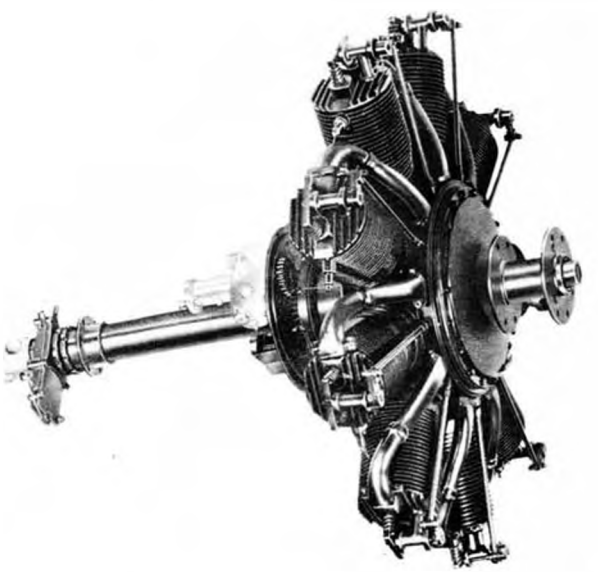
Our two newest department editors, starting in this issue, are a couple of guys who really need no introduction . . . . OK? So much for that . . . .

* * *

On second thought, whoever heard of Chuck Smith and Dick Mathis?

If your bag is R/C pylon racing, active or armchair, you may have heard of Bob Smith, who currently holds the record in Formula I with a somewhat rapid 1:30. Besides being known as "Bob Smith's brother," *Chuck* Smith is also an excellent pylon pilot, and together with Bob, under the dubious name of PB Products, has designed and produced the well known "Miss BS" P-51 for FAI and "Miss DARA" for Formula I.

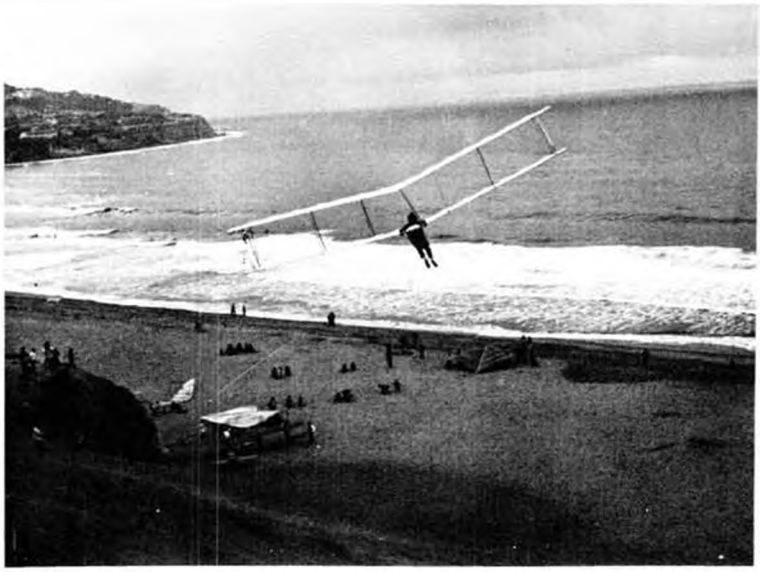
The control-line natives are getting restless, and understandably so. Three issues of The MODEL BUILDER have come out with nary a sign of a ukie model and it's been sort of embarrassing. The problem has been to find a keystone around which to build such a department in the magazine. But the long wait should be considered worthwhile, for we now have the services of a gentleman who is well known and active in control line circles ('tis the season for corn). The handle is Dick "Fast Richard" Mathis of Richardson, Texas, whose



Complete kit for Le Rhone engine from Williams Bros. looks like this when it is assembled. Set has 145 parts. Available in 1-1/2 and 2 inch scale for $9.95 and $11.95. Photo is of the model!

Latest engine from Williams Bros., the Wright J-5. A year in developement, over 150 parts.

"Hey Ma! Guess what I was doing this afternoon down at the beach!" This Rogallo type hang glider carried the "pilot" to the water's edge, where he turned to the left and made a stand-up landing.



This swept-wing biplane has outboard rudders, giving excellent directional control. Well designed glider made some of best flights of day. Scene was hang-glider gathering at Torrance Beach, California.

recently published book on U-Control we reviewed last month. He may not be a "keystone", but he are pretty big!

In the above introductions we have continually referred to departments or sections of the magazine devoted to various categories of modeling. As we have stated previously, modeling is really a *one* thing, and we don't like to see it departmentalized. On the other hand, if we don't organize the published material in each issue, it becomes a muddled hodge-podge. There does seem to be a compromise, though. Since we're all one big happy family (aren't we?), everyone will take a turn at the head of the table, and we'll mix up the rest of the seating each month. (Charlie Reed, you sit next to Bob Penko for a while.)

Come to think of it, R/C does not as yet have its own department in MB. However, with such large R/C subdivisions as pylon and soaring being ably covered by Chuck and Le (That is the correct spelling, by the way. The other "e" fell off one cold night in Arkansas), we'll try to cover the rest of it in this column and in separate articles when the occasion warrants.

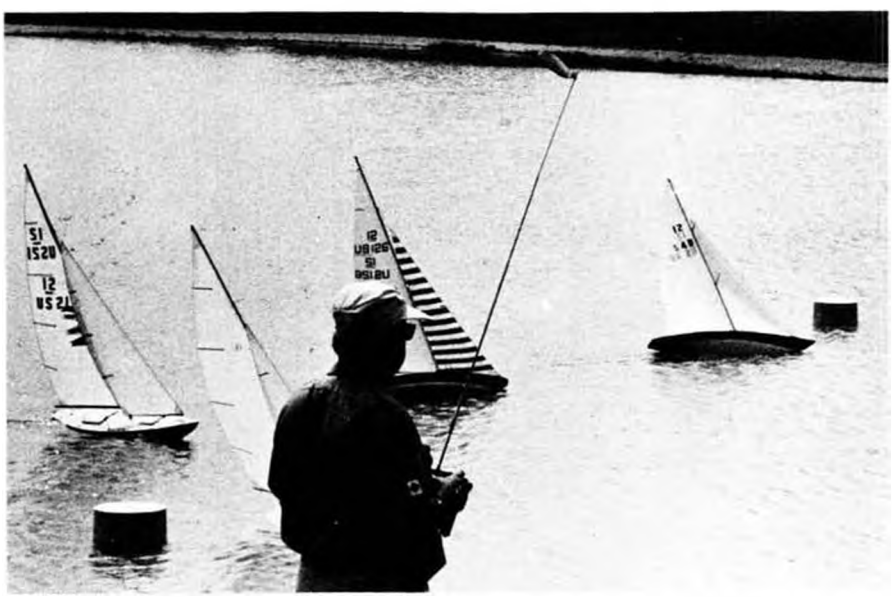
One more thing on the subject of our contributing editors and their departments. The request is foremost from this editor that their subject matter shall emphasize the "how-to" of Modeling. It's nice to know who won what at various contests around the country and the world, but we feel it's really more important to our readers to find out *how* it happened. We want informative material on design reasoning, construction methods, competition kinks, flight trimming, etc. In most any area of the country, you will find that the modelers who are able to rub elbows with the experts in a given field of modeling, also become proficient in that field. Through The MODEL BUILDER, we want modelers in *all* areas to have the same opportunities. Let us know what *you* want to know.

WHAT'S AMYA?

Do you know what AMYA is? It am . . . er, it *is* the American Model Yachting Association, and its officers am . . . *are* Richard Matt, President, 5340 S. Wolf Rd., Western Springs, Ill. 60558; Ben Hogensen, Sec'y-Treas., P.O. Box 127, Woodlyn, Pa. 19094; and Ray Hottinger, Newsletter Editor, 206 Elmwood Dr., Colorado Springs, Colo. 80907.

As of the fall of 1971, the association had 265 members, with 347 registered yachts. At that time, there were 11 classes of yachts recognized, including the better known Santa Barbara, East Coast 12 Meter, and Ten-Raters as well as 50/800, 36/600, Regatta O-D, West Coast 12-Meter, Dumas Star 45, Half Meter O-D, "X", and "A".

Membership in the association is $3.65 per year ($3.66 in Leap Year 1972?) and the big quarterly newsletter is worth the price of admission alone. With a national organization going for it the sport of R/C yachting, already expanding at a great rate, should really take off. We encourage the AMYA to send news and pictures of activities. The MODEL BUILDER is not limited to model aircraft alone, and until model yachting becomes large enough to support a separate publication, we will be glad to give yachting readers a column or section of their own. The big "IF" is material. We cannot go out and get it. You must make it available to us. It's your move . . . .



East Coast 12 Meter R/C yachts about to round the buoy at regatta in Memphis, Tenn. This class is increasing in popularity in the American Model Yachting Association.

IS IT ORBIT OR IS IT OBIT?

In reading newsletters from various parts of the country, it has been interesting to see how many different ways Orbit Electronics has been going down the drain. The funny thing is that when such an outfit is practically right under your nose and you see people connected with it almost every week for some reason or another, you never give the rumors a second thought.

When traveling between our office and the printer, we pass within a quarter of a mile of the Datatron buildings in which the Orbit operation holds forth, and it suddenly occurred to us not long ago to swing off the freeway and take a look.

Without going into detail it looks like this: Orbit is *not* down the drain, it has *not* been sold to a furniture dealer in Peoria, Bob Dunham has *not* moved to South America where he's a Volkswagon salesman for Hitler Motors, and the transmitters are *not* being assembled by the Indians on Alcatraz.

Getting more to the point, 1971 was a year they'd rather forget. By the time they were ready to start delivering 1971 radios, the other manufacturers were making plans for 1972. The decision was made to incorporate the '72 changes into the '71 radios and go ahead and ship. The radios going out now are actually '72s. Except for minor facelifting, the exteriors are unchanged. Most of the internal revisions are for purposes of improving quality control, the weakest link in Orbit's chain over the past few years. The primary aim is to have radios on the shelf, ready for delivery, at the time they are being shown at Toledo in February.

In summary, we'd say that Orbit has successfully retrenched and that an increasing number of black boxes will be spotted in the impound tents this year . . . er, with Orbit's name on them.

* * *

GO TAKE A RUNNING JUMP!!!

A few weeks ago we drove out to Torrance Beach, California and watched some people who are really hung up on their sport. How would you like to grab about thirty to fifty feet of 2 or 3 inch diameter aluminum tubing and about three to four hundred square feet of sheet plastic and jump off a cliff?? This is what we watched several young men doing at this gathering of hang-glider enthusiasts.

Prior to this, our idea of hang-gliding was based on movies we had seen of idiots running madly down the side of a hill carrying a bunch of debris that

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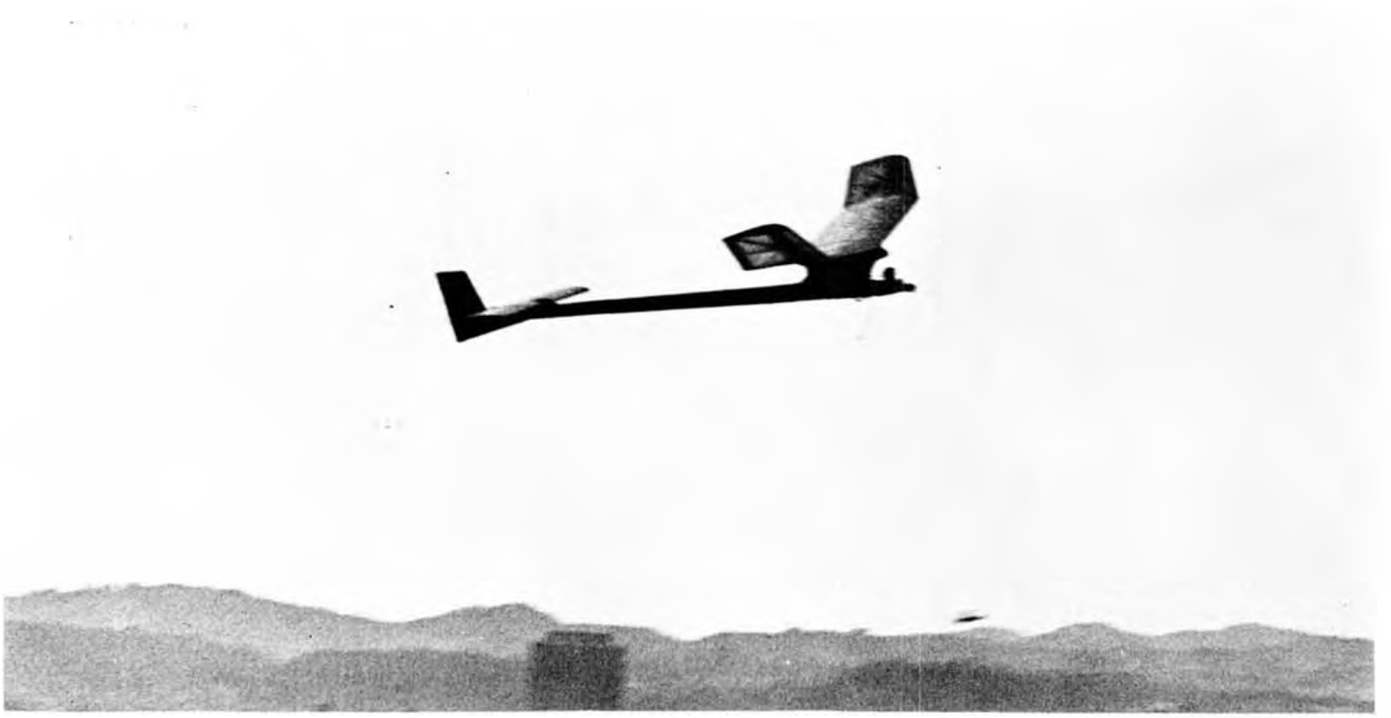
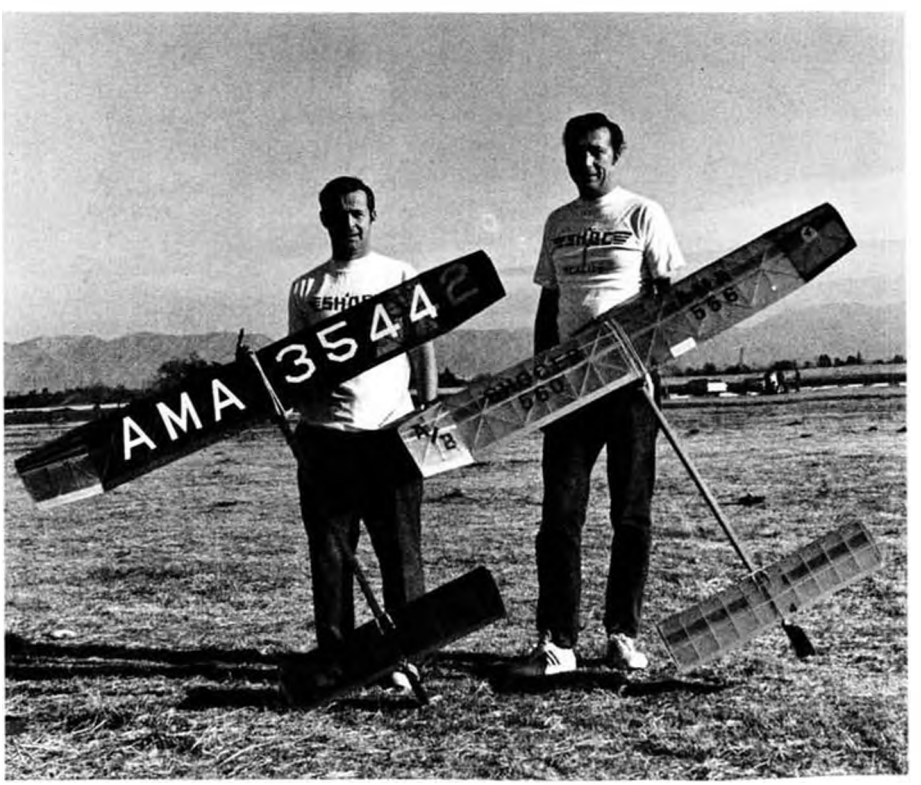


Photos by George Bahrman

SHOCER !

AMA's District X F/F Contest Board Member and MODEL BUILDER's columnist for "The Unattached" presents the main ingredient for beating the competition in 1972, the "SHOCER"... by Mel Schmidt



Don Zink (left) and author/designer of Shocer, Mel Schmidt, with their 560 versions for A/B competition. Paul Ryan and Bob Watson flew same ship at 1971 Nats. Design suited for '72 rules.

● The Shocer is well suited for the new 1972 free flight rules and is intended for use in a tough competitive field. It is thoroughly proven and has been developed to win. For power safety, a long fuselage with a relatively large rear fin and stabilizer are used. Built-in warps and incidence, along with high power, corkscrew the Shocer up to a floating glide. For consistency, surfaces are designed to be rigid and free from warp changes.

In this article, emphasis is placed on flight trimming and design reasoning. Flight trimming is the source of most problems yet many design articles hardly touch on the subject. We hope that this design and text contribute in some way to your understanding of contest free flight. Flying a modern contest free flight is something like mountain climbing. It is an emotional experience. Succeed and you have a machine of truly amazing performance; a machine which accelerates from your hand to a breath-taking climb and floating glide. Fail, and in just a few seconds, you may have nothing. It requires courage to release that first flight, and fortitude, grit and backbone to rebuild after making a mistake. Just remember that the machine only does what it is told to do. It doesn't think, nor is it mystic.

Power, stability, and control were obtained by the following:

(1) From ships designed and flown,

Don Zink's "Shocer" accelerating from VTO takeoff. Flight times exceed 4 minutes for 8 second power run in dead air.

Developed by the 1969, 1970, 1971 California FFMAASC champion, the Shocer has proven to be a top competitor.

it has been found that the control of power is improved as the C.G. is moved back. On this design the C.G. is at 85% of the wing cord.

(2) Using a larger size stab makes the exact location of the center of gravity less critical and generally makes the plane more forgiving and stable under power. The control of power has been improved as the stab was increased from 29% to 37% of the wing area.

(3) An unrestricted propeller slipstream which passes directly over the tail and under the wing has proven to be a big item in controlling power. The movement caused by the up load at the tail, a long distance from the C.G., is more powerful in preventing loops. Test flights have proven that under high power this design has little tendency to loop or turn. This confirms the stabilizing effect of the rear of the ship.

(4) An ultra short nose seems to reduce the effects that torque changes have on flight trim. The control of power improved as the nose length was shortened.

(5) From many flights it has been learned that small tails and short fuselages cause real power handling problems. Up to a point, the control of power is improved as the tail is increased in size and the fuselage is lengthened.

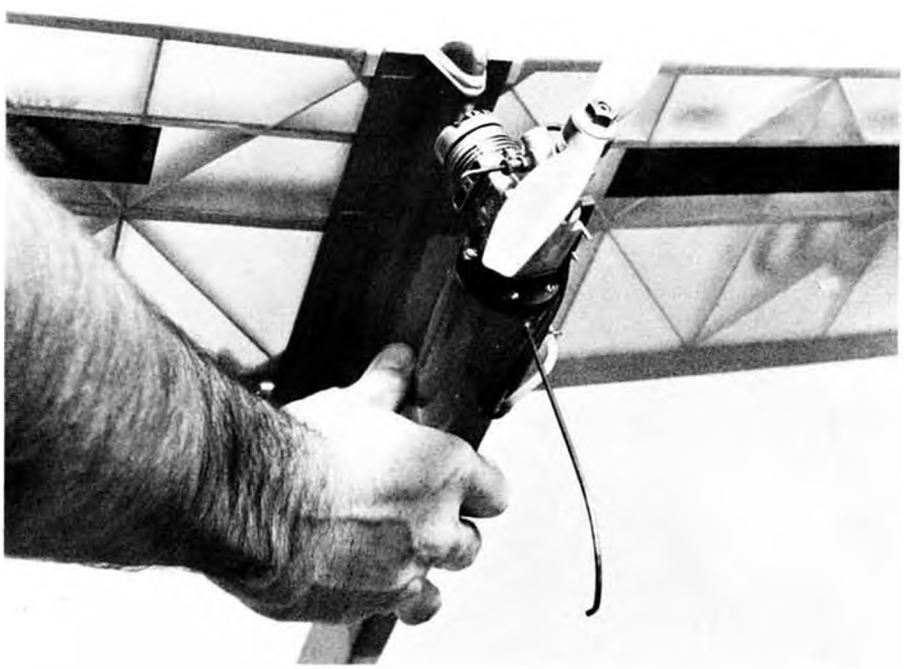
(6) High aspect ratio wings (over 8 ½) are generally troublesome under very high power. A moderate aspect ratio of around 7 ½ seems a good compromise and the glide will not suffer if the wing loading is kept reasonably low.

(7) On this design, with a rather large vertical tail and high pylon, the slipstream has a lot to act on. The slipstream twist acting on the pylon tends to cause a right turn, the high vertical tail causes a left turn, and the low vertical tail causes a right turn. The result is a natural right turn under high power. Heavy wash-in on the right wing is used to cause a vertical spiral. Flying without the heavy wash-in would result in a right dive while flying with wash-in and improper pylon/tail areas or misaligned structures could easily result in a left spiral from high altitudes.

(8) The ship's size may be of some interest. The ideal is simply this: The model should climb as high as possible and should weigh no more than necessary, all with reliability, consistency and performance. The photos show the fourth ship built by the author. Seven others have been built and flown by Don Zink and Paul Ryan of Southern California, and Bob Watson of Chicago.

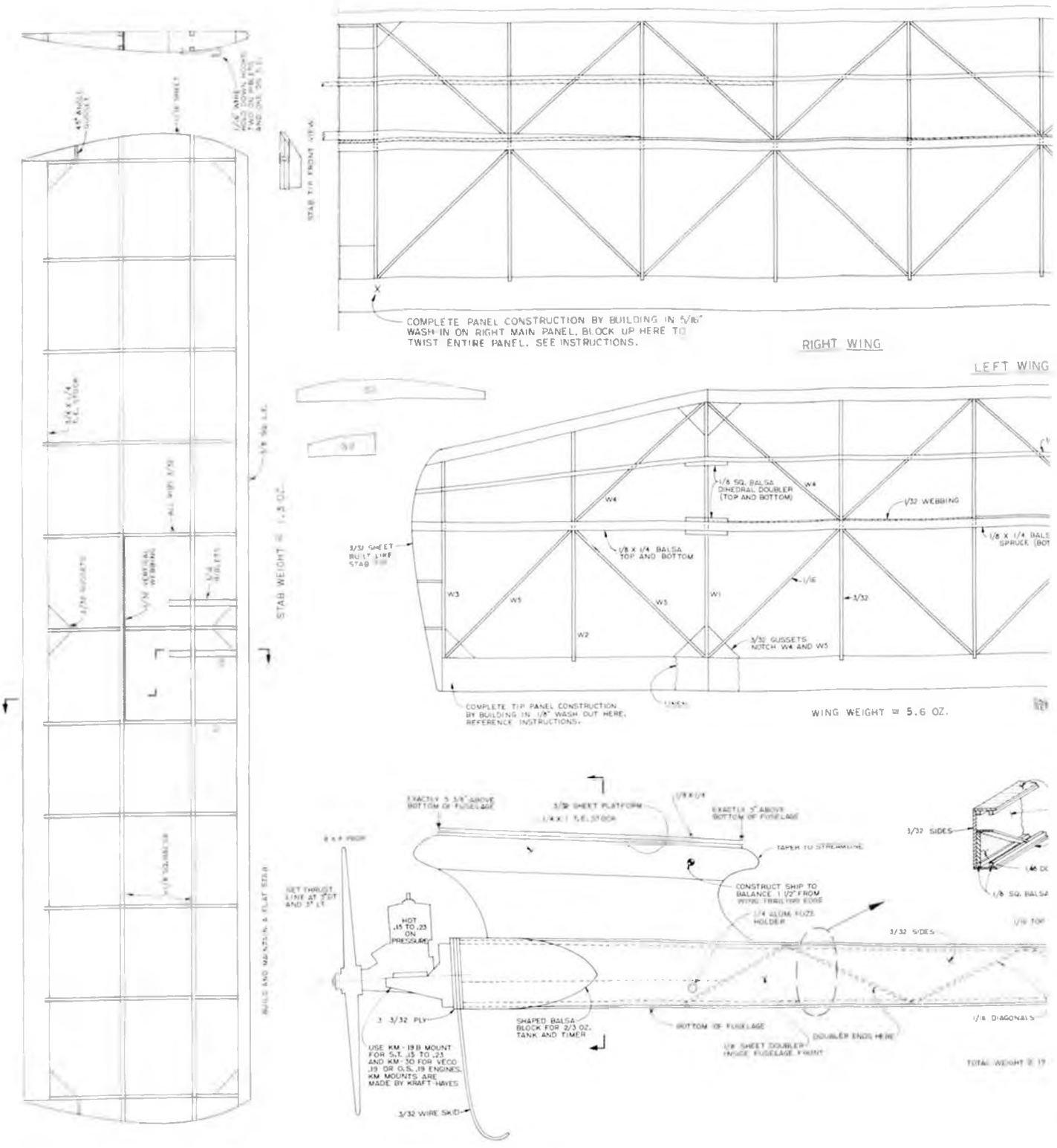
(9) The use of left thrust, right rudder tab, and sufficient climb speed guarantee a good transition. A good transition can also be obtained by using an auto rudder and no left thrust. Mount a Tatone Flood-off inverted and use the fuel trip to double as an auto rudder release. The fuel flood-off and auto rudder trip at the same instant.

(10) Trimming the Shocer for power and glide is really not difficult. On



Geodetic wing structure prevents high speed wing flutter. Fuselage fairs neatly into Kraft-Hayes glass filled fiberglass molded engine mount. ST G/20 .23 is tilted for access to plug.

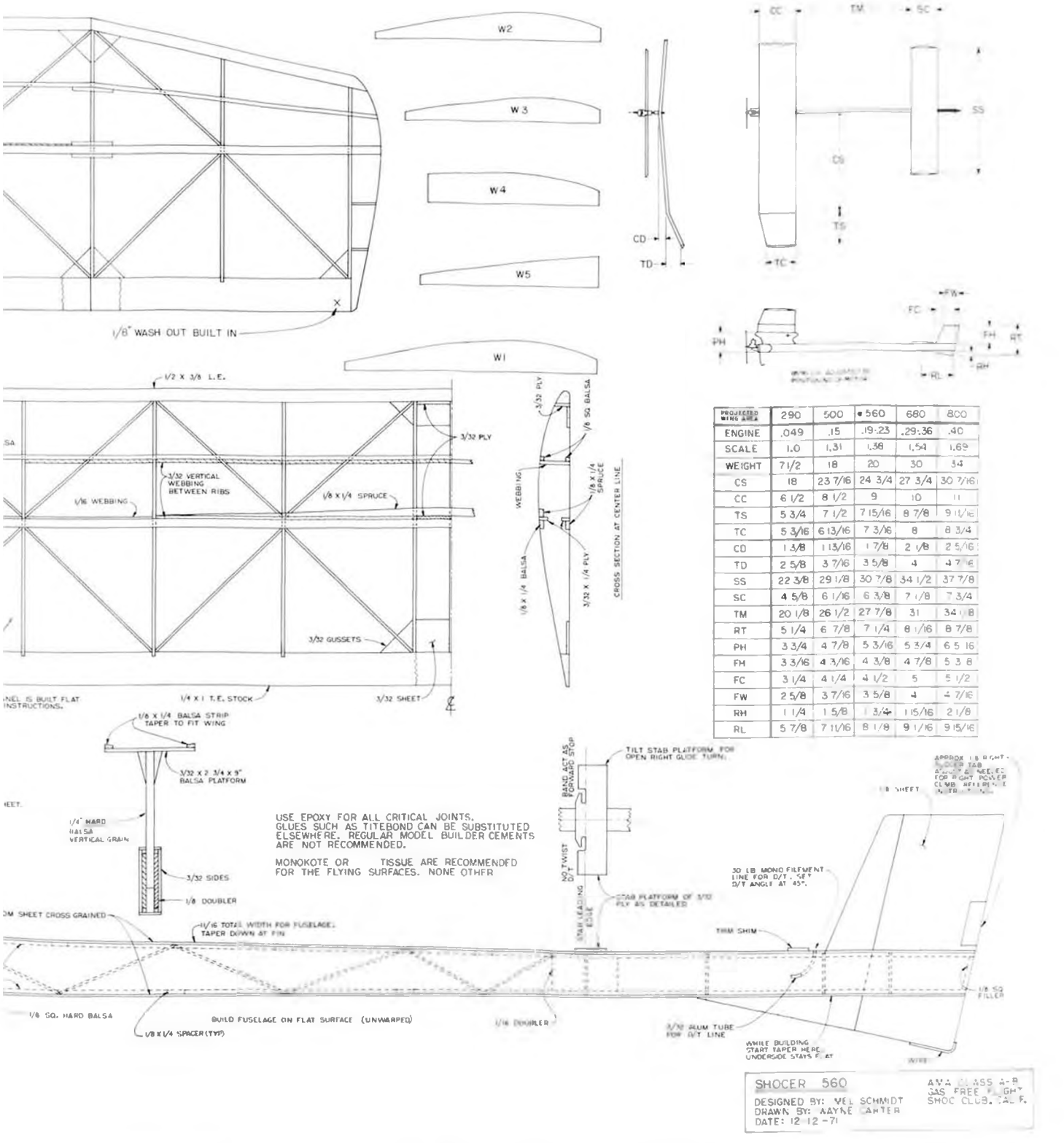
FULL SIZE PLANS AVAILABLE — SEE PAGE 48



No. 4 Shocer the only adjustment found necessary was to add incidence to increase the climb angle under high power. The plane has a natural right climb. No trim adjustment was required for the glide. In the event that you have flight problems, refer to the end of this article.

To establish a performance baseline, flight tests were made in completely calm and non-thermal conditions. Flights averaged over 4 minutes when using an 8 second motor run from a hand launch. The test ship was identical to that described here. Also, hundreds of long thermal flights have been made on different ships. These flights have proven that no undesirable characteristics exist. We have also included the overall dimensions for Shocers in other sizes.

Use Sig contest balsa or an equivalent for construction. Titebond and epoxy are recommended for the normal and high stress joints. However, if you live in a wet region, Titebond is not recommended. Monokote in two contrasting colors is suggested for the flying surfaces with Hobbypoxy paint for the fuselage. Make sure your building surface is flat. If it is not, go out and get a new one. Since the fuselage is built over

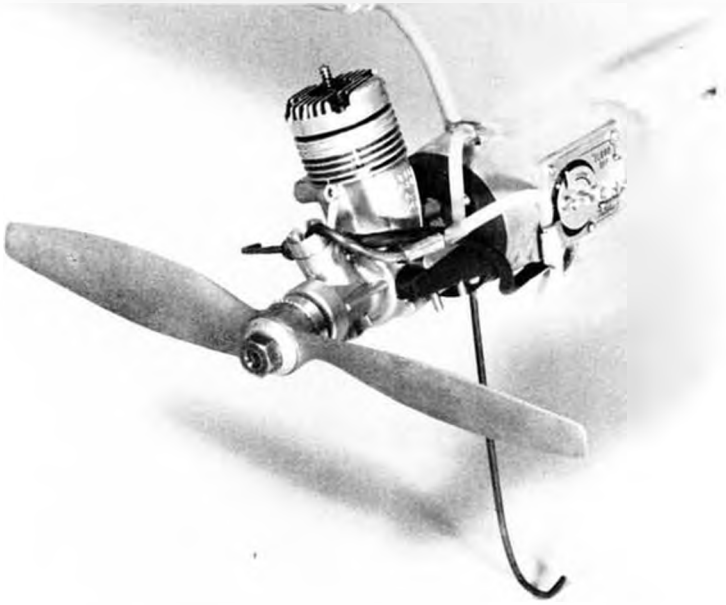


PROJECTED WING AREA	290	500	• 560	680	800
ENGINE	.049	.15	.19-.23	.29-.36	.40
SCALE	1.0	1.31	1.38	1.54	1.69
WEIGHT	7 1/2	18	20	30	34
CS	18	23 7/16	24 3/4	27 3/4	30 7/16
CC	6 1/2	8 1/2	9	10	11
TS	5 3/4	7 1/2	7 15/16	8 7/8	9 11/16
TC	5 3/16	6 13/16	7 3/16	8	8 3/4
CD	1 3/8	1 13/16	1 7/8	2 1/8	2 5/16
TD	2 5/8	3 7/16	3 5/8	4	4 7/16
SS	22 3/8	29 1/8	30 7/8	34 1/2	37 7/8
SC	4 5/8	6 1/16	6 3/8	7 1/8	7 3/4
TM	20 1/8	26 1/2	27 7/8	31	34 1/8
RT	5 1/4	6 7/8	7 1/4	8 1/16	8 7/8
PH	3 3/4	4 7/8	5 3/16	5 3/4	6 5 16
FH	3 3/16	4 3/16	4 3/8	4 7/8	5 3 8
FC	3 1/4	4 1/4	4 1/2	5	5 1/2
FW	2 5/8	3 7/16	3 5/8	4	4 7/16
RH	1 1/4	1 5/8	1 3/4	1 15/16	2 1/8
RL	5 7/8	7 11/16	8 1/8	9 1/16	9 15/16

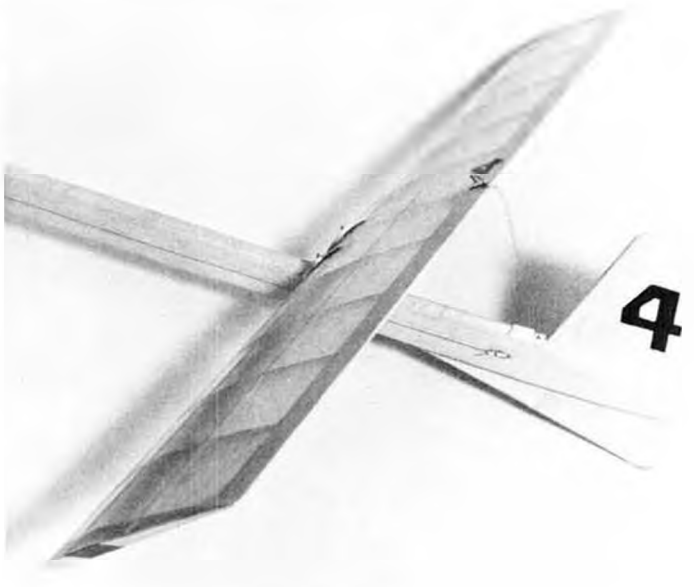
the side view, this is a MUST.

Build the right wing main panel and right and left wing tips in the following way: Pin down and glue the leading edge, trailing edge, bottom spars, main ribs and front geodetic ribs (W5). Let the glue dry, then unpin and shim in the required wash-in or wash-out as called for. Complete panel construction by gluing in the top spar, top stringer and rear geodetic ribs (W6). The left main panel is built completely on a flat surface. Reference the table on the plans and the cross section for details on the dihedral joints. The leading and trailing edge material for the center panels should be of medium hard balsa. Main ribs should be of 8-12 lb balsa. The geodetic ribs can be 4-6 lb contest balsa. Use epoxy for at least the dihedral joints. The remainder of the construction is considered self-explanatory.

Check for alignment before you fly. Lay the wing on a flat surface and measure the amount of wash-in or wash-out in each of the four panels. If not in direct agreement with the plans, reshape the wing. For Monokoted surfaces, have an assistant pass an iron over the panel while you hold. Recheck and



The business end of "Shocer" showing the plumbing hook up for the Tatone "Flood-Off" timer. Copper tube directs fuel to venturi, giving instant shut-off. Wire skid protects prop and engine on D/T landing.



Stab at D/T angle. Release is by fuse up front. Note cross-grain sheeting on fuselage top. Power trim by rudder tab and stabilizer incidence block. Tail structure light and easy to build. Rear fin aids power control.

align the wing until it has the specified shape. Then lay the stab on a flat surface and check for warps. Stab warps must be taken out. Place a long straight edge along the pylon and rudder. If built properly, the pylon and rudder will be aligned. If not, correct the problem before proceeding. If you do not use an auto rudder, the engine must point to the left and down in reference to the fuselage side and bottom. The use of a protractor is recommended to check the thrust line. Any deviation from the plans must be corrected by shimming behind the motor mount.

For the incidence alignment, check the distance from the front of the wing platform to the bottom of the fuselage and the distance from the back of the wing platform to the bottom of the fuselage. Measure the stab platform by the same method. The angular difference between the wing and stab platform (decalage) should be 2 1/2 – 2 3/4 degrees.

Assemble the plane. Mark the center of gravity position on the pylon by measuring from the trailing edge of the wing. Balance the ship. If it is nose or tail heavy correct same by lead shims behind the motor mount or tail weight. Look at the ship from the top view. The wing and stab should be squared up with the fuselage and each other. A large ninety degree angle can be used to check this alignment. View the ship from the tail end to check stab tilt. The right tip of the stab should be high enough that the stab is almost parallel with the right main panel of the wing. Stab tilt which is slightly less than the right wing panel has proven to be the best. With all of the above accomplished, you are ready to start test flying . . . and not before!

Hand glide the model. The glide should be to the right . . . long and flat. If the ship stalls or dives badly, recheck all alignment. Minor imperfections in the glide can be corrected after the first power tests. Run the engine to make sure the motor, tank and timer system work properly and that the engine will run at less than 1/2 power. Do not fly at full power until you are well into the trimming flights. Use low nitro fuel in the beginning and the same brand of 8 x 4 prop with the prop on the correct direction for all flights.

Stab incidence, rubber tab and left thrust are used *only* for power adjustments.

Weight and stab tilt are used for glide adjustment.

Do not use stab incidence for adjusting the glide. Just remember to fly with caution and understand clearly the effect of an adjustment before you fly.

The following comments should be of help during trimming. Each paragraph describes a problem and its solution:

a. The ship is hand launched at a 20 to 30 degree angle with less than 3/4 power. The ship climbs straight away at a very low angle and then makes a long recovery before gliding. Increase the climb angle by raising the back of the stab (try 1/16 inch) and add a small amount of right tab (try 1/32 inch).

b. The ship is launched with less than 3/4 power on five to seven second run. It climbs straight away ending straight up or on its back when the motor cuts. It then does a quick recovery. Decrease the climb angle by raising the front of the stab (try 1/32 inch) and add a small amount of right tab (try 1/32 inch). Repeat test using a short run.

c. The ship is launched at full power on a seven second run. It turns to the right, does a dip, then pulls its nose up and climbs. Increase the amount of left thrust until the right dip is no longer noticeable.

d. The ship is launched at full power and begins a nice open spiral to the right at a steep angle. Near the end of the motor run it climbs on its back and may even start to the left. Raise the front of the stab about 1/32 inch and fly again. A slight amount (less than 1/32 inch) of right rudder tab may also be needed.

e. The ship is launched at full power. It flies straight up, ending up on its back, does a 180 degree longitudinal roll, then climbs on up in an open right spiral. Take out some left thrust (remove 2 degrees).

f. The ship climbs nicely to the right with the nose up, then after the speed builds up, the climb flattens and the right wing drops. Add more wash-in on the right panel and check the other

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"Mabel, I know you're going to say I've been hitting the jug again, but let me tell you what I just saw flying across the south forty!"

FLYING WINGS

Photos by the Editor

A photographic visit with the Northrop Model Airplane Club during it's 5th Annual Flying Wing contest, held on Nov. 21, 1971 at Sepulveda Basin, Van Nuys, California.

Always a popular event, this year's meet brought out some real interesting departures from the "normal" aircraft configuration. . .to say the least!

Rest easy, folks, it's only Bill Watson's Fox 15 powered "Big Turkey". Flies about 2 or 3 mph.

Walt Mooney's "YIELD" sign. Plans may be obtained from the California Highway Dept.

Bill Watson again, with push-pull Snoopy doghouse. Bill will probably be first to fly a stove!

Tony Naccarto and foam XB-35with twin .020 power. Hobby shop proprietor in Burbank, Ca.

Frank Colver's scale model of his 32 foot hang glider. Very stable design. Plans available.

Wayne Schindler assembled 6 Ace Mini-foam wings to make this 8 foot model. Cox .049 power with pusher prop and Tatone cut-off.

A/1 Class original by Bob Provart, Newbury Park, Ca. "Counterfeit" design has 25 degree sweep, 270 sq. in., body falls away for D/T.

pylon

The MODEL BUILDER takes pleasure in introducing its new Pylon columnist Chuck Smith, who knows his way around, in front of, and behind the scenes, when it comes to R/C's most exciting airborn sport.

● Since this is my first column for The MODEL BUILDER, I thought that I would begin by expressing a few random thoughts about our hobby-sport. Radio controlled pylon racing has been the object of much criticism and abuse from the day it was conceived. It has been called many things from "ridiculous" to "nonsense". Pylon racing, especially Formula I, has been accused of being too dangerous, too noisy and too demanding for all but the expert modeler. I would like to discuss each of these accusations and try to clear up some of the misconceptions which many modelers have.

First, I would like to relate to my own experience in racing. I witnessed one of my first pylon races several years ago at the Sepulveda Basin. I had a very uneasy feeling in my stomach while watching this event. When the contest was over, I had no desire at all to ever build or race a Formula I aircraft. I was left with the impression that the planes were too fast, hard to handle, and that the degree of pilot skill required was far beyond what I could hope to achieve. I suppose that many modelers have been left with this same impression after watching a pylon race.

I did not begin to chnage my mind toward Formula I until I had experienced the excitement of flying in my first open pylon race. I eventually built and flew Formula I planes and found my impression had been totally wrong. I discovered that a well designed and built Formula I ship is very stable and that the erratic behavior of some pylon racers is almost always caused by a trembling hand on the transmitter stick. As far as pilot skill is concerned, it is my opinion that a pilot who can fly a decent Class A pattern, has a little above average reaction time and has cool nerves can make a good racing pilot.

Even with the best pilots, however, there is still the possibility of a mistake in judgement which could lead to a serious incident. Every race pilot knows the element of danger involved. That is why the current AMA and NMPRA safety rules concerning spectator distances must be strictly enforced at all meets. Most close calls I've seen have occurred when spectators have been within the minimum distances. The present rules, however, do not provide protection for the persons in the most vulnerable position — the workers at the pylons. Rules which specify protective barriers must be written if we expect to prevent any serious incidents in the future. *(Safety rules are not frozen by AMA. This could be officially corrected at any time. WCN)*

Of course, the most commonly proposed solution to the problem of safety is just to slow the planes down. With adequate spectator and worker protection, however, the danger presented by crashes due to pilot error is virtually

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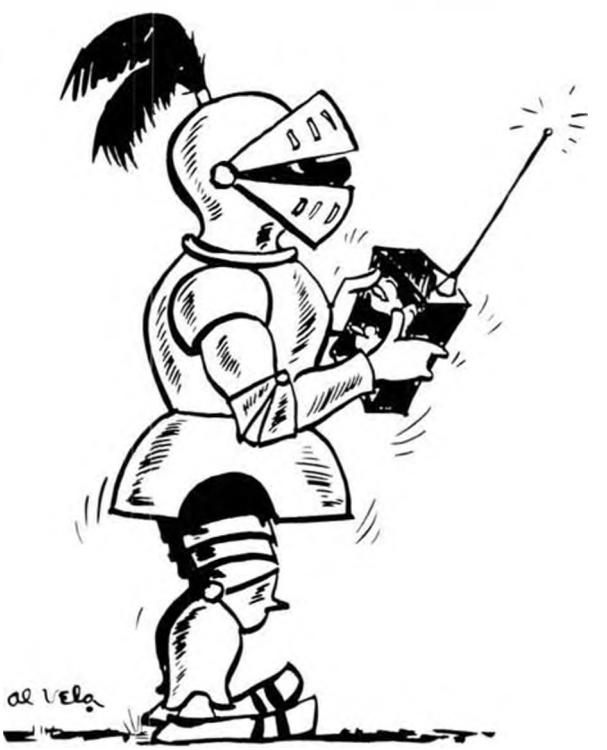
Photos by Chuck Smith

Our new pylon columnist about to fly a heat at Bakersfield last summer. Brother Bob lofts Chuck's Shoestring for flagman's identification.



PYLON/4

Starting a new subdivision of Pylon Racing that may have its own spot very soon if it continues to grow at its present rate.

Photos by the Editor

Quarter Midgets take off in a heat at Mile Square races held by Orange Coast and Northrop R/C groups. Read about it in column. Kaplan, Grove, and Holden in this heat. Grove in fly-off.

Seeing is believing! The winner at Mile Square was Carl Weyl's "Spirit of St. Louis" with Fox .15 power. Plane had Kraft KPS-9's, big pack, six channel receiver. Still weighed only 2.55 pounds.

Don Barton and his pretty Pogo with Enya .15. All fliers used 7x6 props, either wood or nylon

Orange Coast R/C Pres. Bert Baker and his orig. design being checked for 10 second idle rule.

Kent Thomas, Len Dean, and G. Alvedo take off for another heat. Winners earned points as in Formula I racing. No fun just racing time!

RACE REPORT – BY FRED REESE

● On Sunday, December 6, the Northrop Modelers of El Segundo, Calif. hosted the Orange Coast RC Club at Mile Square for Quarter Midget races. Fifteen airplanes came to race. Wally Davidson and Don Dombrowski, with many helpers, ran the sixteen heat races smoothly and efficiently.

Flying skill and consistent engines proved to be more valuable than flat out speed. The winning airplane, flown by Carl Wyle was a Fox .15 powered "Spirit of St. Louis"!" Shocking? Not really. Carl is a smooth, competent flier and he flew the shortest distance around the two pylons. His airplane is only 3/4 oz. above the 2½ pound minimum, is aerodynamically clean, and very easy to fly.

It was quickly apparent that the flat bottomed or high lift wings could get around the pylons more quickly than the thin racing wing types. Having to fly a wider course lost all of the speed advantage the thin wing might offer. Some work needs to be done on airfoil selection which will give both high speed and low stall speed, be light in weight and easy to build without twisting. Excess weight seemed to be as much of a disadvantage in the turns as poor wing design.

The second place airplane was Don Grove's "Cassutt Special" (designed by the writer) and powered by an OS .15. Don's "Cassutt" was only 20 feet behind Carl's "Spirit" at the finish of the fly-off race. Again, Don's airplane was fast and consistent, and he flew very tightly around the pylons.

Third place went to George Alvedo, flying a Super Tigre powered Francis P-51. There were four of these P-51's entered, all with Super Tigres. Actually, performance of the P-51's was disappointing, except for the one built by Paul White, who showed us what can be done with this airplane. His beautiful

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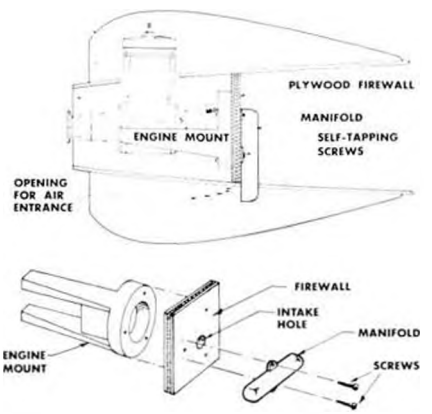
Dave Lane has the right idea. Ear damage from noise is accumulative. Why hurry the build-up?



Williams Bros. air flow manifold (S.50) is ready made item that can be used in Bob Upton's engine installation idea illustrated last month.

eliminated since pilot-induced crashes rarely, if ever, occur outside the spectator boundaries (except for, perhaps, landings). The only real danger is then presented by a crash occurring in a crowd of spectators due to radio failure, and this danger is present in all aspects of R/C flying. I'm afraid that this danger will always be with us, although radios have become much more reliable. Of course, a model aircraft traveling at 140 mph in this situation would, in most cases, be more dangerous than one going 80 mph, but both could be lethal.

Many modelers, who have seen the times of Formula I go from the 1:50's to the low 1:30's in the past two seasons, have logically concluded that pylon racing is getting more dangerous. Increased speeds have been largely responsible for these lower times, but one must remember that anyone who turns a time under 1:40 *must* fly a smooth and *safe* course. Even with the faster times in our contests in Southern California last year, it is the opinion of most flyers that this was our safest racing season yet. This is mainly a tribute to the increased flying skill of the racing pilots.

The noise created by racing .40's has been another point of debate. In all aspects of racing, noise is an integral part. Ask almost any one of the 250,000 spectators who go to the Indianapolis 500 each year to tell you why he goes and he'll say it's to hear the roar of the 750+ hp engines at full bore going down the straights. The main reason that the turbine was virtually banned from Indianapolis was that the traditional sound of the Offys and Fords would have eventually disappeared. The same thing applies to drag racing and especially full size air racing. I don't think there's a more exciting sound in the world than a P-51 on the deck at full bore.

Model pylon racing has great potential for spectator appeal and it seems noise must remain a part of racing if it is going to continue to attract spectators; therefore, I feel that mufflers should never become mandatory for Formula I. Most Formula I contests in the Southern California area are held at sites where noise is not a problem. I think that most flyers in this area would want to break away from the NMPRA if a ruling was made which required them to put mufflers on their racers when it is unnecessary. Of course, the situation is different in many other sections of the country. Formula I should be flown only at sites where noise would not be a problem, but if this is not possible in some situations, mufflers should then, and only then, be required at the discretion of the contest director.

It takes much dedication and time to be a success in pylon racing. Several proposals have therefore been put forth that would allow it to appeal to a larger cross section of modelers. One proposal is to limit the event to strictly stock engines. I personally cannot see how such a rule could work. The general definition of an engine that is not stock is "one that runs better than the one I've got". Well, John Brodbeck of K&B has run stock engines in pylon racing this season with great success. His secret is that he can choose the best stock engines from the many he tests.

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Wouldn't you know that golfer Bud Anders NMPRA racing number had to be "FOUR"? Scene is year's last race at Whittier Narrows.

Ed Hotelling, last year's FAST Club novice race winner is now a competent flier to be reckoned with. Fifth at Tucson. Loren McCray helps.

The planes may be smaller, but the effort is just as big. Jack Swanson gives Kent Thomas a hand at the Mile Square quarter midget races.

Paul White submits to the 10 second idle check as Orbit's John Elliott holds on. Interested spectators are Jack Stafford and Don Patton.

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ship even had retractable landing gear, and really moved. However, landing gear problems and rich engine runs kept him from contention. What was amazing was that Leonard Dean flying a thick winged "Shoestring", was keeping up with Paul by flying a super-tight course while Paul was flying wide around the pylons. Leonard was in a three way tie for first place going into the fourth round but he cut four pylons in his last heat, which knocked him out of contention.

There were no bad incidents or crashes and all but two of the racers were still flying at the end of the day. Most of the airplanes landed with their engines running and very few missed the one and a half minute starting time limit.

It certainly proved that these small airplanes can be safely flown under control in competition and still give the spectators competitive action.

While checking out the different Quarter Midgets, I found that they had two things in common: minimum control surface movement and slightly nose-heavy weight distribution. Balance points varied from about 15 to 25 percent of the wing chord. Inadequate stabilizer area can cause a nose-heavy Quarter Midget to run out of up-elevator during landing. Twenty percent of the wing area is safe for the stabilizer area and I would not recommend less.

Elevator movement should be about 1/4 inch in each direction. If the airplane snap rolls out of a ninety degree bank turn from full up-elevator, the movement should be decreased. Don't check for this with less than 2 or 3 hundred feet altitude. You'll need the altitude to recover in time if the plane snaps. There should be no chance that your airplane will snap roll out of a high-G turn during a race.

Frank Szekula holds Bob Gillespie's Francis P-51 while OS .15 is checked for proper idle.

Paul White designed and built the uncomplicated retract gear in his Francis P-51. Next month!

Aileron movement can be adjusted to individual preference for roll rate. Full span strip ailerons on a mid-winged racer should move about 1/8 to 3/16 inch in each direction. This will give slow to moderate roll rate, which is sufficient for racing. Inset ailerons can move about 3/16 to 1/4 inch to give the same results. Start with the lesser movement and increase later if desired. For racing, I prefer soft or unsensitive controls. The airplane will fly a smoother course and speed is lost to drag each time a control surface is moved.

Right now, an OS .15 in a 2½ pound, minimum dimension racer with a wing that will turn quickly is the airplane to beat.

Editor's Comment: Having watched the very satisfactory races at Mile Square, as reported by Fred Reese, we'd suggest a compromise engine control arrangement, based on the system used there.

Winners shall be determined on a point basis, similar to Formula I. Racing against time alone loses much of the glamour of head to head competition.

Plane must be landed with engine running. Dead-stick landing causes loss of one finishing point. No points lost if engine stops on landing due to prop ticking ground, etc. Problem: What's to stop almost full bore landings, due to lousy idle?

Partial answer: As per Mile Square races, a 10 second idle test was required to qualify. After that "No toucha da needle valve!" Partial problem: Oh yeah? Who's going to watch all of the needle valves? Partial answer: At the

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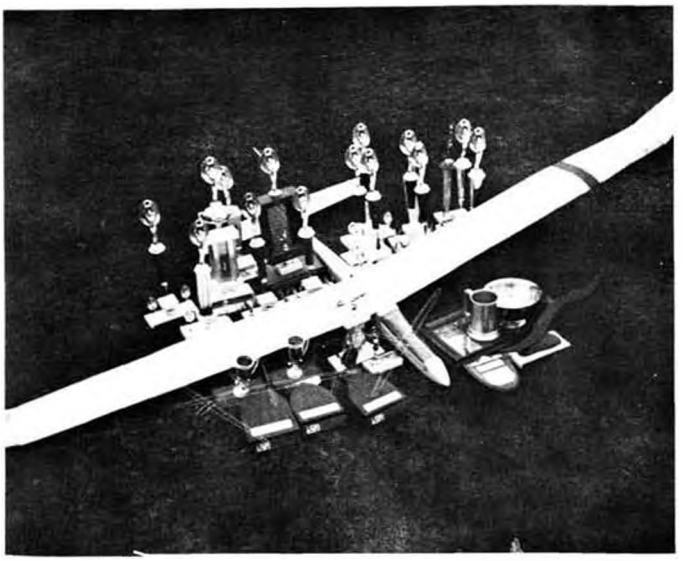
LOOK OUT !!
here comes Rick and
WHITE TRASH !



No, he didn't put the trophies there and then land "White Trash" in the spot. But some of Rick's competitors are ready to believe he could!

Two years ago and an earlier "W/T" without the 18 inch tip panels, Rick poses with Les Andersen and his Phoebus.

Text by Le Gray

● *West Coast R/C Soaring Pilots hoped that model airplanes were just a passing phase . . . then they tried to encourage interest in hub-cap resales . . . there were even plans to reactivate age-class competition categories . . . anything short of ack-ack to get relief from the teenage plague of . . .*

WHITE TRASH

designed by Rick Walters

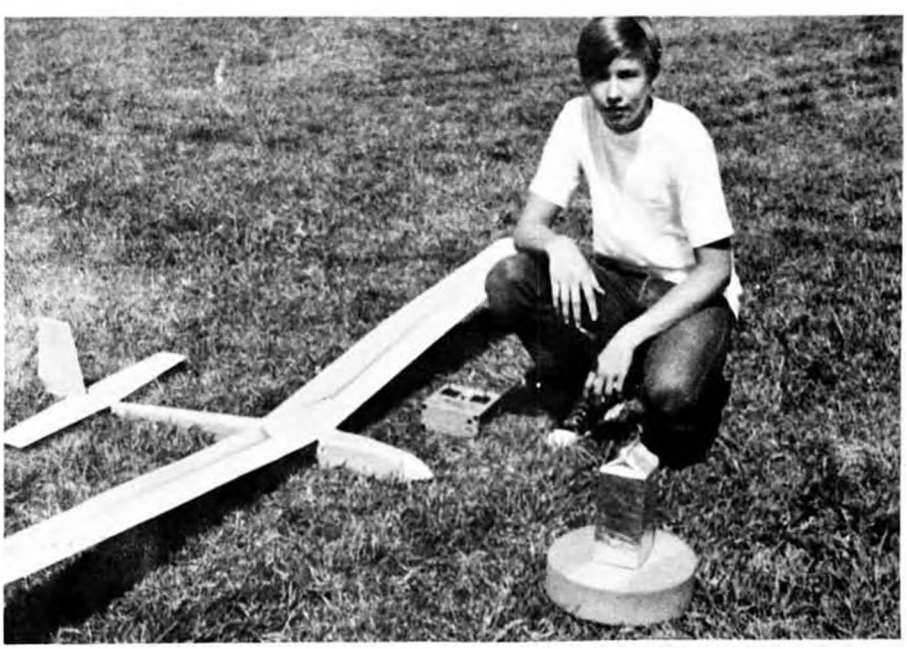
How do you write about a boy and his model airplane without it sounding like an episode from "Lassie?" It's simple . . . if you're writing about Richard Fredrick Walters of Saratoga, California. The "Lassie" bit fades quickly, because Rick Walters is hardly a "boy" by any standard. This 17 year-old young man stands a cool and slender 6-foot-4 in his basketball-team-center-stocking-feet, and he and his "White Trash" sailplane have repeatedly humbled the best R/C soaring pilots the West Coast competition circuits have provided.

There are more brass cups in this kid's room than at a Martian Beauty Contest. Any Flash Gordon fans out there? And the really maddening part is that they have all been won with disgustingly good sportsmanship. If there's anything I can't stand, it's a good winner.

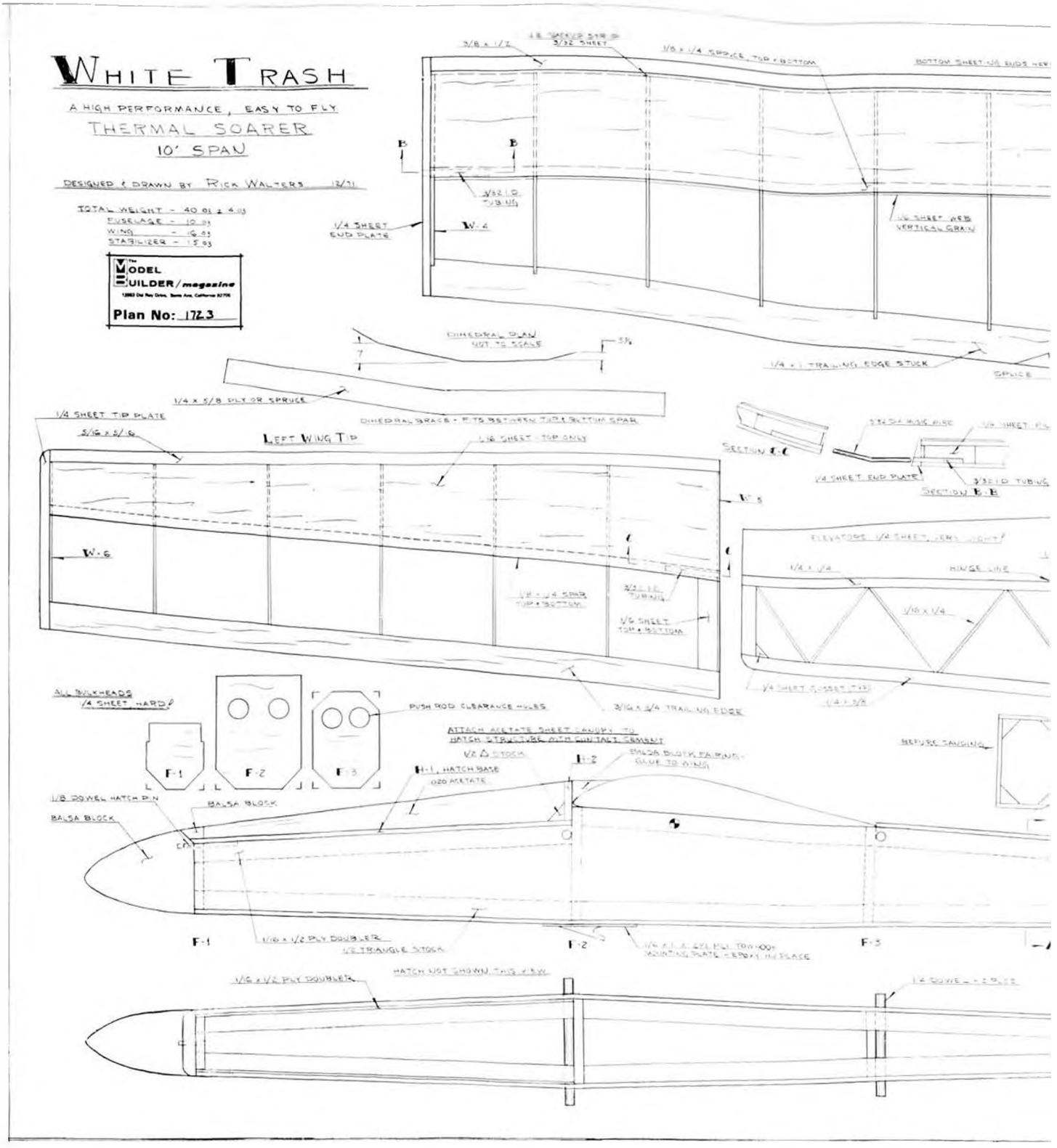
If I were getting paid by the word, I'd list all his trophies. Suffice it to identify the major awards, such as the South Bay Soaring Society Annual Championship . . . 1st Place, 1969 . . . 2nd Place, 1970 . . . 1st Place, 1971; and the LSF Soaring Tournament . . . 10th Overall in 1970 . . . 1st Place Overall, 1971 with a 1st Place in both the Duration Event and the Precision Event for good measure.

Let's talk about those contests. The South Bay Soaring Society is the second oldest R/C soaring club in the country . . . Harbor Soaring Society is older. The South Bay Group is one of the largest and is the very most active in R/C soaring competition . . . has been from the day of founding . . . in fact, it was founded to promote R/C soaring competition. The SBSS, headquartered in the Santa Clara Valley, at the bottom . . . make that at the South end . . . of San Francisco Bay, sponsors an R/C soaring contest each month throughout the year . . . total of twelve. From the very outset, their contests attracted no less than 20-25 competitors. In 1970 they were pushing 35-40, and this past year have topped 40 going for 50 pilots fighting for the monthly awards. The guy that winds up tow-dawg for the year beats out tough, eager and experienced competition . . . frequently. To take home the SBSS Annual Championship Award, one must place either first or second . . . with no more than a couple of thirds, if any . . . in all twelve contests. And that, my friends, takes consistency with a capital "K", against mean competition in anybody's league.

The LSF Tournament is the nation's largest and most challenging R/C soaring affair . . . a grueling two-day event demanding top performance in duration, spot-landing, speed and distance. In the 1970 stewdo, Rick "blew-it" . . .



Not another trophy, at least not this time! It's actually a milk carton covered with aluminum foil and fastened to a foam base to act as an easy-to-spot spot. That's where Rick landed tho!

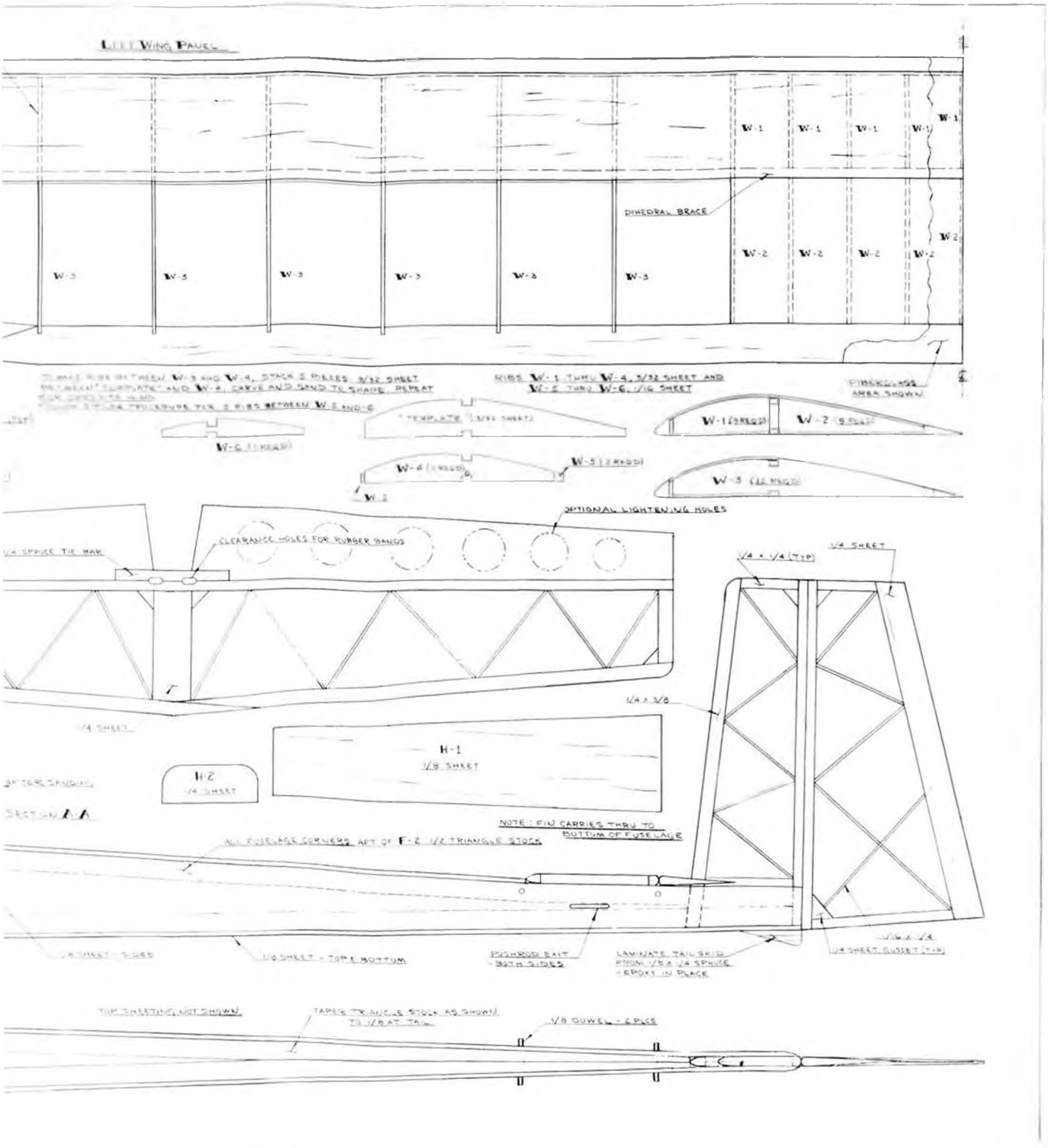


claiming only 10th in a field of 85, and the hopes of the Sun City Soaring Set began to rise. But in 1971, this teenage "has been" made a dramatic comeback, topping a roster of 103 pilots in absolutely lousy weather.

To these major marks, add similar consistency in the North Bay Soaring Society monthly contests . . . an occasional plaque or two from the fabulous and frightful R/C Sailplane Pylon Races produced each year by Whitey Prichard and the Santa Cruz R/C Bees . . . top level if not top award performance in the 1970 North-South Meet, the "War Between the State" in California . . . and the 1970 R/C Sailplane Nationals near Glenview, Illinois.

Without doubt, "White Trash" holds the record of being the winningest R/C sailplane in the country . . . at least. Well, figure it up: twelve SBSS contests per year for 3 years is 36 trophies, plus the Championship Cups; say another 24 at the NBSS contests; allow for 3 from the '71 LSF Soar-lympics; a few from the North-South and Santa Cruz meets; and a couple of "field record" placques. Add these and you get upwards of 70 real quick. Any questions? Rick only claims 37, but you know how kids are . . . they lie a lot.

So that's sorta the background of competition pilot Rick Walters, LSF Member No. 003 and Level IV, and the pedigree of his "White Trash". The



FULL SIZE PLANS AVAILABLE — SEE PAGE 48

design is just over 3 years old . . . is in its sixth configuration . . . and obviously can provide championship performance with appropriate piloting.

"White Trash" isn't just a "one man" airplane. About half a dozen have been built to date. Younger brother Jeff Walters flew his to a big First Place in Sportsman Class Duration Event at the 1970 Tournament. Neighborhood buddy Chris Mauntz was pushing Rick hard and pulled a close Second Place, Precision at the '71 Soar-lympics. These young gentlemen, too, have collected much additional hardware with "White Trash".

But we're not selling kids, we're selling sailplanes. What's with this super machine? Well, super it's not, but as Benny Howard, of yesteryear "Mr. Mulligan" racing fame identified his airplanes, it is a DGA . . . "darned" good airplane. All in all, "White Trash" is a simple but direct solution to a set of complex problems. Construction is basic, proportions are conservative, and layout is conventional. This results in a sound and practical tool with which to work when attacking the challenge of micro-meteorology . . . R/C soaring.

Rick Walters' "White Trash" is stable, and will circle tightly enough to give the impression that it's pivoting on its

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A Standard Austria takes off on the winch tow at Kirchheim-Teck, Germany, near the Schempp-Hirth factory.

R/C SOARING

By Le Gray

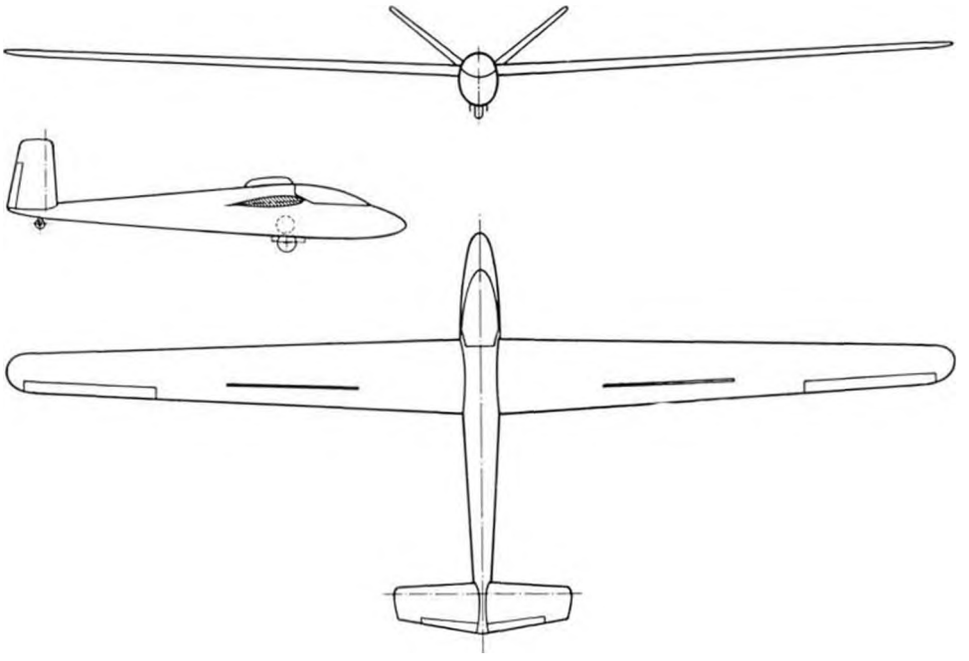
This month our Soaring editor gives us something to think about when we contemplate the designing of a scale glider. The reasoning is worth considering when it comes to powered aircraft too.

● One of the more fascinating aspects of R/C sailplanes is realism...or perhaps, more correctly, realistic appearance. The "purist"...the strictly functional design enthusiast...may raise a balsa-dusted eyebrow, but let's talk about it for a minute.

There are two types of realism to be considered: static and dynamic. That is, "at rest" and "in flight". The first type of realistic appearance is best exemplified by the scale or semi-scale model, These kinds of models, by definition, present the same basic lines, contours and proportions as their full-scale counterparts. However, many so-called "functional" models also are of a configuration which closely resembles man-carrying craft. And the beautiful workmanship on so many R/C sailplanes seems to add to the illusion of miniaturism...no matter what the plan form may be.

In the air, it's another story. As Old Flying Buddy, Paul Forrette, used to say, "Any sailplane looks good in a thermal." We might also add that any R/C sailplane at altitude looks realistic. It's fundamental. An R/C sailplane has the same basic size relationships...essentially, a long slender wing and small fuselage cross-section...the same beautiful silence in flight, and the same easy speed of it's larger brother. If you want to really check the validity of that "realism in the air" bit, kick it around with some soaring pilot who has flown along a ridge where R/C sailplanes are operating ...such as over the Pacific surf at Torrv Pines, or at Mission Peak near the Santa Clara Valley of California. "They can give you a real thrill," according to Dan Dickinson, Chief Instructor for the Orange County Soaring Association. Dan flys both sizes...as you'll find many guys do. Does that make 'em like say "ac and dc"? He confirms that in the air an R/C sailplane looks no different than another manned craft...just a matter of relative size.

While we're on the subject of model and full size sailplanes using the same air space, there's a point of safety involved that should be brought before the council. Not the obvious, air-to-air problem, but that of attracting manned sailplanes into a hillside. Literally! Apparantly there is no record of such an incident, but it is a potential hazard that must not be ignored. It works like this. To the pilot in a sailplane, a model appears to be another sailplane at some distance away...as noted above. Now if this distance is horizontal, there's not too much of a problem. But consider what could happen if models were working the same ridge as manned sailplanes. From the cockpit, it would appear to the pilot looking down at the models that he was considerably higher than they, and thereby quite a distance above the hillside. A couple of things could happen. Our pilot...who may be inexperienced...may continue to fly the ridge lift until he is too low to return to a safe landing area, and have to put it down in a less than desirable location. Or worse, he could fly in so close to the hill as to actually catch a wing and scratch up the whole damn machine. Believing himself to be at a safe height...



after all, those guys "down there" are way below him and still above the ground...he would not be particularly alert to his problem. In fact, much less so than if he was alone in the area. Then he would have no reference to judge by and would watch for other indicators of his vertical distance over the ridge. Far fetched? Not really...if air traffic and soaring conditions are "right". Les Arnold, one of American Soaring's grand gentlemen, and founder of Sky Sailing Airport near Fremont, California was one of the first to identify the problem. His soaring school pilots, as well as others operating out of Sky Sailing utilized the lift of the Diablo Mountain Range...as did and do R/C soarers. A working arrangement, though, has kept basic operating areas well separated...by miles.

A couple of years ago, we can recall one particularly "strong" lift day when a whole covey of sailplane pilots flew down the Diablo ridges to our model soaring area. Usually, they could not get that far away from their normal hillsides. But that day they did...and they were fairly low...under overcast skies. We waved and shouted and did all sorts of wild things to attract their attention and, hopefully, make them realize they were in a modeling zone...and maybe go away. Jim Matous was there that day with his "Eclipse"...published in Model Airplane News a while back. This combination presented two hazards. First, the "Eclipse" spans a full sixteen feet, and at times those of us on the ground had difficulty identifying which was model and which was not. Then, second, Jim's physical size is exceeded only by his personality...sorta the Man Mountain Dean of R/C soaring...and we all figured that if those guys were dumb enough to be that far down the ridge, one of them might try to slope soar off the windward side of Big Jim. Anyhow, by the time sixteen...count 'em, sixteen...sailplanes were in the same air that we were working, we called it quits. It just figured that a couple of those guys would tangle wingtips before long, and if there was a model anywhere in the area, it would have been the cause of it all. We could just see the headlines. So we left and let them have it. Besides, it was getting cold...and it was Matous' turn to buy coffee.

Okay, so back to R/C sailplanes and their realistic appearance. Is realism important? Or is it desirable? Should we play it down...or up...or just ignore it... or what? Perhaps it's not an earth-shaking...that's a California colloquialism...problem, but realism, as an "attraction factor", can mean new people which means growth which means new money which means new industry which means a bigger, better hobby/sport for all of us. So maybe realism is important. But whether or not, why fight it? It's a natural element of R/C soaring.

Every sport has its "full-time" enthusiasts...its hard core....its avant-garde. But without growth it withers. Without new blood it dies. Without new ideas it stagnates. If realism attracts, so be it.

It's quite possible that the optimum R/C sailplane design....whenever that comes...will be of a strictly functional configuration. But until the day of the ultimate machine, there are a lot of guys who will be building scale or semi-scale models and just flying up a storm. And at present, many of these realistic aberrations are quite competitive in performance. Those that are are usually semi-

No, it's not Son of Godzilla. The San Fernando Valley Silent Fliers call it the Dum-Dum award, and no one wants to earn it. It's perpetual too!

COMPARATIVE ANALYSIS OF 40 SAILPLANES

at two scales and several loadings

		FULL SCALE			1/5 scale (2.4" = 1'–0")							1/6 scale (2.0" = 1'–0")						
					SCALE VALUES				Wt.(lbs) at Ldg. (oz/sq.ft.)			SCALE VALUES				Wt.(lbs) at Ldg. (oz/sq.ft.)		
No.	Configuration	Col 1 Span(ft)	Col 2 Area	Col 3 Gr. Wt.	Col 4 Span(in)	Col 5 Area	Col 6 Weight	Col 7 Ldng	Col 8 8	Col 9 10	Col 10 12	Col 11 Span(in)	Col 12 Area	Col 13 Weight	Col 14 Ldng	Col 15 8	Col 16 10	Col 17 12
1.	2-33	51	220	1040	122	8.8	8.5	15.6	4.4	5.5	6.6	102	6.1	5.0	13.0	3.0	3.8	4.6
2.	TG-2	52	214	860	125	8.6	6.9	12.8	4.3	5.4	6.4	104	6.0	4.0	10.5	3.0	3.8	4.4
3.	Minimoa	56	205	772	134	8.2	6.2	12.1	4.0	5.1	6.1	112	5.7	3.6	10.0	2.8	3.6	4.3
4.	T-53B	56	194	1160	134	7.7	9.3	19.1	3.8	4.8	5.7	112	5.4	5.4	15.9	2.7	3.4	4.0
5.	Bergfalke	55	193	1025	132	7.7	8.2	17.0	3.8	4.8	5.7	110	5.3	4.8	14.2	2.7	3.4	4.0
6.	Pioneer	46	190	700	110	7.6	5.6	11.8	3.8	4.8	5.7	92	5.3	3.3	9.8	2.7	3.4	4.0
7.	2-32	57	180	1340	137	7.2	10.7	22.2	3.6	4.5	5.4	114	5.0	6.3	20.0	2.5	3.1	3.7
8.	Skylark 4	60	173	830	144	7.0	6.7	15.2	3.5	4.4	5.2	120	4.8	3.9	12.8	2.4	3.0	3.6
9.	Primary	38	170	400	92	6.8	3.2	7.5	3.4	4.2	5.0	76	4.7	1.9	6.4	2.3	3.0	3.6
10.	1-23H	53	164	750	127	6.6	6.0	14.6	3.3	4.1	4.9	106	4.6	3.5	11.2	2.3	2.8	3.4
11.	Wolf	49	162	550	118	6.5	4.4	10.8	3.2	4.0	4.9	98	4.5	2.6	9.1	2.2	2.8	3.4
12.	1-26	40	160	575	96	6.4	4.6	11.6	3.2	4.0	4.8	80	4.5	2.7	9.7	2.2	2.8	3.4
13.	Shk	56	158	816	134	6.3	6.5	16.5	3.2	3.9	4.7	112	4.4	3.8	13.4	2.2	2.7	3.3
14.	Zugvogel	56	156	805	134	6.3	6.4	16.5	3.2	3.9	4.7	112	4.4	3.7	13.4	2.2	2.7	3.3
15.	1-29	49	154	750	118	6.2	6.0	15.6	3.1	3.8	4.6	98	4.3	3.5	13.0	2.1	2.7	3.2
16.	Diamont 18	59	154	970	143	6.2	7.8	20.1	3.1	3.8	4.6	118	4.3	4.5	16.8	2.1	2.7	3.2
17.	Ka8	49	153	683	118	6.1	5.4	14.1	3.1	3.8	4.6	98	4.3	3.2	11.9	2.1	2.7	3.2
18.	Phoebus C	56	151	827	134	6.0	6.6	17.0	3.0	3.7	4.5	112	4.2	3.9	14.7	2.1	2.6	3.1
19.	1-34	49	151	800	118	6.0	6.4	18.2	3.0	3.7	4.5	98	4.2	3.7	14.0	2.1	2.6	3.1
20.	B.Bowlus	45	150	505	107	6.0	4.0	10.6	3.0	3.7	4.5	89	4.2	2.4	9.2	2.1	2.6	3.1
21.	Dart 17	56	148	780	134	5.9	6.2	16.9	2.9	3.7	4.4	112	4.1	3.6	14.1	2.0	2.5	3.2
22.	Std. Austria	49	146	772	118	5.9	6.2	17.0	2.9	3.7	4.4	98	4.1	3.6	14.0	2.0	2.5	3.2
23.	HP-14T	59	146	774	143	5.9	5.9	16.2	2.9	3.7	4.4	118	4.1	3.5	13.5	2.0	2.5	3.2
24.	LP-49	49	143	700	118	5.7	5.6	15.6	2.8	3.6	4.3	98	4.0	3.3	13.1	2.0	2.5	3.0
25.	BG-12	50	141	750	120	5.7	6.0	17.0	2.8	3.6	4.3	100	3.9	3.5	14.2	2.0	2.5	3.0
26.	Phoebus A	49	141	772	118	5.7	6.2	17.5	2.8	3.6	4.3	98	4.0	3.6	14.8	2.0	2.5	3.0
27.	AS-W12	60	140	948	144	5.6	7.6	21.5	2.8	3.5	4.2	120	3.9	4.4	18.0	1.9	2.4	2.9
28.	HP-14V	55	138	728	131	5.5	5.8	16.8	2.7	3.4	4.1	109	3.9	3.4	14.0	1.9	2.4	2.9
29.	Cirrus	58	136	882	139	5.4	7.1	20.8	2.7	3.4	4.0	116	3.8	4.2	17.7	1.9	2.4	2.9
30.	Dart STd	49	135	840	118	5.4	6.7	19.8	2.7	3.4	4.0	98	3.8	3.9	16.1	1.9	2.4	2.9
31.	Foka	49	131	764	118	5.2	6.1	18.7	2.6	3.2	3.9	98	3.7	3.6	15.5	1.8	2.3	2.8
32.	Edelweiss	49	130	910	118	5.2	7.3	22.3	2.6	3.2	3.9	98	3.6	4.2	18.8	1.8	2.3	2.8
33.	Cherokee	40	125	530	96	5.0	4.3	13.6	2.5	3.1	3.8	80	3.5	2.5	11.2	1.7	2.2	2.6
34.	Elfe	49	125	650	118	5.0	5.2	16.6	2.5	3.1	3.8	98	3.5	3.0	13.8	1.7	2.2	2.6
35.	Prue Std.	49	122	725	118	4.9	5.8	18.9	2.5	3.1	3.7	98	3.4	3.4	16.0	1.7	2.1	2.5
36.	AS-W15	49	118	700	118	4.6	5.6	19.4	2.3	2.8	3.5	98	3.3	3.3	15.8	1.6	2.1	2.5
37.	Sisu	50	108	765	120	4.3	6.1	22.4	2.2	2.7	3.2	100	3.0	3.6	19.4	1.5	1.9	2.3
38.	Cirrus Std.	49	108	728	118	4.3	5.8	21.5	2.2	2.7	3.2	98	3.0	3.4	18.0	1.5	1.9	2.3
39.	Libell	49	106	638	118	4.2	5.1	19.4	2.1	2.6	3.1	98	3.0	3.0	15.9	1.5	1.9	2.3
40.	Diamont 15	49	105	640	118	4.2	5.1	19.5	2.1	2.6	3.1	98	2.9	3.0	16.6	1.4	1.8	2.2

scale, especially in wing planform and section.

It is generally accepted that wing airfoil sections utilized on the big birds are not suitable for models, so let's just write that variance off for now. But wing planform? Why have a scale model...or a so-called scale model...with a wing size and outline that is not accurate? Many times you'll find that an extra inch or so has been added to the wing chord...and maybe several inches or even a foot or two has been tacked on to the span. Really, the reason is obvious enough, and not without some justification. An accurate reduction of a full-scale sailplane's dimensions to a "normal" size model often results in a wing area that is simply too small. That is, at the scale size that most modelers

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Photos by Fudo Takagi

This little peanut is a natural flier on CO-2 or rubber. A little small for a dethermalizer, so have your track shoes handy just in case!

PEANUT-BRITISH HOMEBUILT

By Walt Mooney

Our man of unlimited sources found a natural for scale free flight in the little Ord-Hume O-H 7 English homebuilt. Walt has given this peanut scale a split personality by showing how to install CO-2 or rubber power.

This little model of a small English homebuilt is an ideal configuration for a Peanut Scale. It has a high wing, with low aspect ratio and adequate dihedral. It has a tall squarish fuselage and a relatively large tail. The model also has a longish nose and tail. All of the above characteristics fit it well for a career as a Peanut. A three-view of the O.H. 7 can be found in JANE'S The Worlds Aircraft for '70-71.

The model shown in the photographs was originally built as a rubber powered Peanut and after about six months of successful flying, indoors and out, it was converted to CO-2 power using one of Bill Brown's delightful little engines. It differs from the plans in several minor places. First, the wing has a single spar and sheet ribs. The wing on the plans has two spars and sliced ribs which will give a lighter wing and better support for the strut attach points on the lower surface of the wings. Second, the plans show scale dihedral. The model's dihedral was put in by eye and as luck would have it, it's a little less than scale. The plan model should turn out a little more spirally stable than the original.

Best time indoors with a 10 inch loop of 3 mm Perelli is 42 seconds. Outdoors with a loop of 4 mm it will exceed a minute easily, and although thermals

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Just to prove our Peanut Vendor isn't totally hung up on the little ones, here he is with the 3rd place trophy at the NAR Jumbo meet.

Walt's hand gives an idea of the diminutive size of this little cutie pie. Peanut scale is getting tremendous following. Who'll be first with R/C?

Long flights may be had by using CO-2 power, since only a minimum rate of consumption is required to keep the O.H. airborne.

You can almost hear that McCoy 60 bellowing as SHOC Club member Tom Carmen's Texan scrambles for altitude at 1971 San Valeer's Annual

FREE FLIGHT

Photos by George Bahrman

by Mel Schmidt

CLASS "D" GAS GAINING POPULARITY

● You may have heard that a special free flight event has been flown this last year for .401 to .65 engines. Interest in the event is growing rapidly, so much so that nearly all of the California free flight clubs have scheduled the event for 1972. The event is named Class "D" and was introduced by Bob and Bill Hunter.

Locating an acceptable engine can be a problem. Recently we took a new K&B .40 and accurately measured the stroke and bore. The stroke measured .722 rather than the .720 specified while the bore was right on .840. Calculations indicate that this engine has a displacement of .4001 rather than .3990 and that changing the bore to .850 would result in a .410 displacement well over the required .401 required for class "D". Reaming out the sleeve and plating the piston could do it but there could also be problems with sleeve distortion.

Many flyers have held off building for Class "D" because of the cumbersome engines and cost involved. With a good .41 available Class "D" gas could draw as many entries as "C" gas. Fox and K&B may be our best bet. If you want a .41 contact the manufacturers. We called K&B and talked with John Brodbeck Jr. and Jim Nightingale. They reported that K&B was definitely interested in making a .41 available. Ask your dealer to contact K&B, or, place your order direct with the plant in Downey, Calif. Another motor selection would be the ST .46 Standard. World Engines has them listed in their catalog at less than $25.

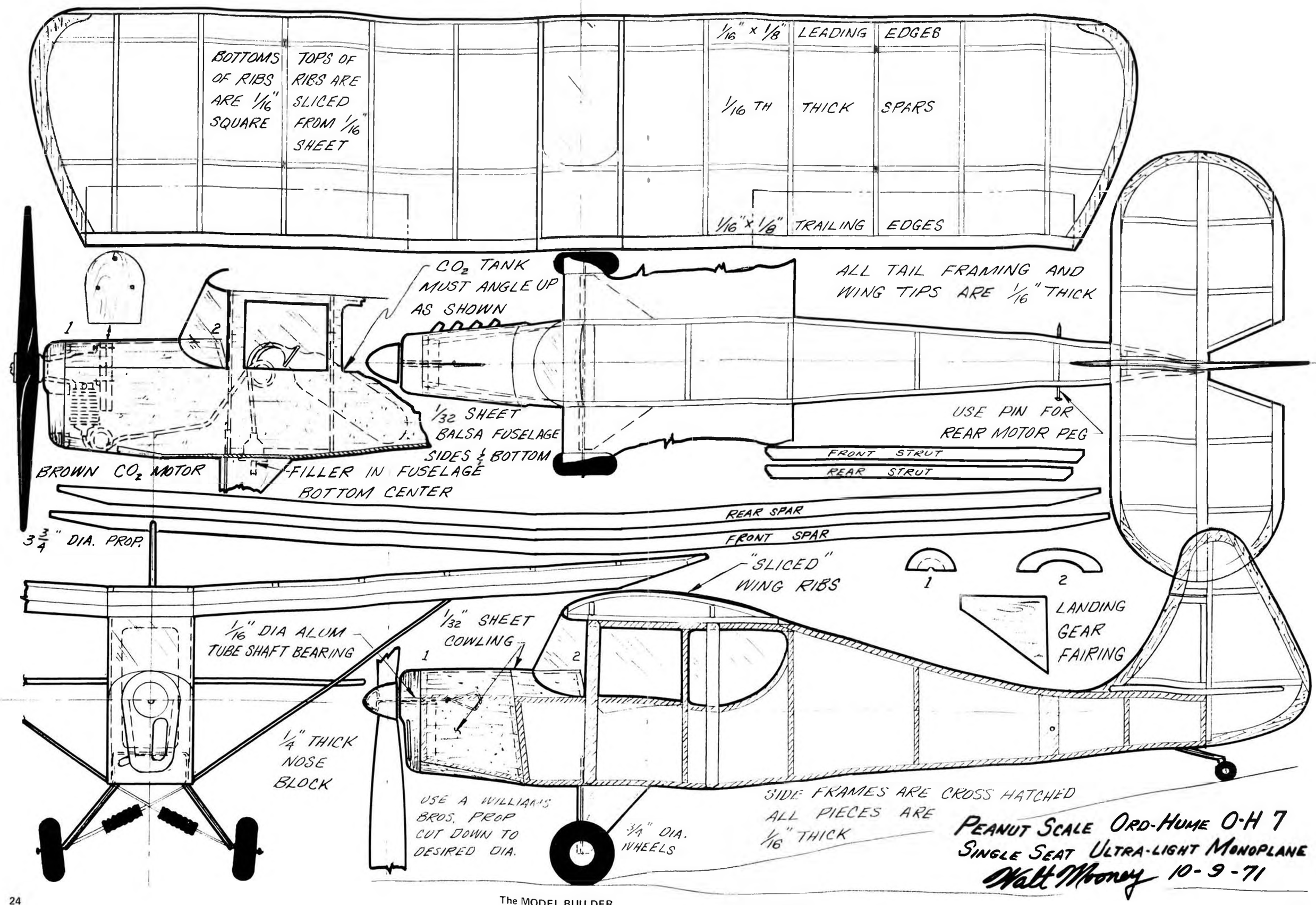
1972 UNITED STATES FREE FLIGHT CHAMPIONSHIPS

The second USFFC has been scheduled for May 27-28-29. The big meet will be held at Taft, Calif. Events will be announced at a later date.

We talked with many flyers from the eastern states who are giving serious thought to making the trip. With all that wide open space, it sure beats flying Free Flight at Chicago. We have a direct line to the USFFC Planning Committee and will keep you up to date on the details.

LEFT OR RIGHT GLIDE TURN?

Flyers have flown ships to the left in the glide for years. The left glide has been used because of habit or because the instructions called for it. But rather than going along with the left turn habit, let us look at a few facts. An eagle or hawk will glide to the right or to the left in a thermal. We have witnessed two birds in the same thermal with one gliding to the right and the other to the left. (*This is what's known as an aerial Paul Jones.* WCV) To convince yourself of this just watch these soaring birds in action. They hunt for air, find it, and may circle either way. Birds know nothing of man-made laws about thermals and neither does Mother Nature.


BOTTOMS OF RIBS ARE 1/16" SQUARE
TOPS OF RIBS ARE SLICED FROM 1/16" SHEET
1/16" x 1/8" LEADING EDGES
1/16 TH THICK SPARS
1/16" x 1/8" TRAILING EDGES
CO2 TANK MUST ANGLE UP AS SHOWN
ALL TAIL FRAMING AND WING TIPS ARE 1/16" THICK
1/32 SHEET BALSA FUSELAGE SIDES & BOTTOM
USE PIN FOR REAR MOTOR PEG
FRONT STRUT
REAR STRUT
BROWN CO2 MOTOR
FILLER IN FUSELAGE BOTTOM CENTER
REAR SPAR
FRONT SPAR
3 3/4" DIA. PROP.
"SLICED" WING RIBS
LANDING GEAR FAIRING
1/16" DIA ALUM TUBE SHAFT BEARING
1/32" SHEET COWLING
1/4" THICK NOSE BLOCK
USE A WILLIAMS BROS. PROP CUT DOWN TO DESIRED DIA.
3/4" DIA. WHEELS
SIDE FRAMES ARE CROSS HATCHED ALL PIECES ARE 1/16" THICK
PEANUT SCALE ORD-HUME O-H 7
SINGLE SEAT ULTRA-LIGHT MONOPLANE
Walt Mooney 10-9-71

Paul Ryan making a rudder tab adjustment on his 440 version of Mel Schmidt's SHOCer at Taft contest. Don't let that knife slip, Paul!

Bob White prepares to wind his Coupe. Nice arrangement! Bob was member of U.S. Wakefield team that went to Finland in August.

The decision as to which way a ship should glide need only be based on trimming considerations. For the high powered pylon gas ship, the power climb is to the right and the transition and glide are best accomplished by gliding to the right. This is true because the safest way to control really high power is to use wash-in (trailing edge down) on the inboard wing panel. When climbing and gliding to the right, right wing wash-in keeps the right wing up. Pylon ships using less power can be flown right-left safely, just as they have for years. However, with the increased emphasis on power, new thinking is needed.

An example of the use of wash-in on the inboard panel is Dick Mathis's Hysteria 1000. His high thrust design calls for heavy wash-in on the left wing and a left-left pattern. He has proven that this is the safest way of flying his ship. For Nordics, a right or left circle can be used depending on which way the ship naturally turns. Nearly all FAI Power flyers use a right-right pattern. And nearly all FAI power ships use some wash-in on the right inboard wing panel. For very high powered ships, a lot of wash-in is mandatory and it seems to make a lot of good sense to glide with the wash-in. What is your opinion?

Bob Hunter sniffs for a thermal before cranking the K&B 40RR on his big Satellite at Taft. Big "D" ships are becoming increasingly popular.

1971 SAN VALEER ANNUAL

A unique method of flyoffs was used at the 1971 San Valeers Annual. Rather than flyers selecting their own time to make flyoff flights, the top ships in each event were launched en masse. A wave of ships was sent up for each event. Class "A" gas had nine in the first wave. There were four Unlimited Rubber ships in the second wave. Class "D" gas and Coupe both had three ships apiece in the flyoffs. Class "C" gas had at least ten.

The rules used for the Gas and Unlimited Rubber events required the flyer to get three five minute maxes to qualify for the flyoffs. Seven minutes was the flight limit for the first flyoff and nine and eleven minutes for the second and third flyoffs respectively. The contest director would blow a whistle indicating the start of a flyoff round. Gas flyers then had 120 seconds to start engines and get airborne. Most gas ships were climbing shortly after the whistle blew. This flyoff method is spectacular but was accepted with mixed emotions by the contestants.

On the positive side, it has the following advantages:

A) It's very obvious which ship climbs the highest.

B) Comparisons are easily made between designs.

C) All ships are close to being in the same air therefore the best ship usually wins.

D) From a spectators viewpoint, ships actually appear to be racing each other on the way up. It is as exciting as a Le Mans racing start.

It seems to have the following disadvantages:

Another Satellite and another Hunter. This time it's Bill and a 1/2A version.

Gus Sundberg gets ready to tow up A/1 Top Kick by Ambroid. George Sugiuchi holding.

A) The flyers have to wait until late in the day to make the flyoff flights.

B) A flyer who qualifies for the flyoffs in two or more events could have very real problems. We had to fly "A" gas, then Unlimited Rubber, then "A" gas again. It took four helpers to handle the spare ships and do the chasing.

C) A delay in getting airborne means the flyer is through. For example, if a rubber motor needs replacement, and you have no backup ship, you're through.

D) It's definitely no place for the inexperienced flyer or the young Junior.

The San Valeer Club has several experimental meets planned for 1972. The details have yet to be announced but whatever the contest rules, it will be interesting. This club is well noted for innovations in Contest Flying and has often shown the way for others. They sponsor Junior events even though the cost for trophies is usually greater than the income from the number of entries expected.

Night temperatures were below 40 degrees while the afternoons were about 65 degrees. A severe sand storm, followed by rain, took place just at flyoff time on Saturday. The flyoff for Saturday was postponed til 8 AM Sunday. The top flyers in each event were as follows:

RESULTS OF 1971

SAN VALEERS ANNUAL

½A Gas

Open — 24 entries

Chuck Ripley	13:59
Jim Scarborough	13:59
Tom Hutchinson	13:15

JR/SR — 9 entries

Mark Summers	14:32
Mike Thompson	13:15
Bob Sundberg	12:09

A Gas

Open — 21 entries

Dick Myers	29:14
Ralph Prey	27:15
Tom Carman	26:47

JR/SR — 10 entries

Mike Taibi	30:30
Keith Wright	30:00
Miss Debbie Beron (!)	29:14

B Gas

Open — 22 entries

Bill Davis	21:54
Scott Harte	20:49
Mel Schmidt	14:39

JR/SR — 6 entries

Bill Booth Jr.	19:07
Mark Summers	18:45
Bob Sundberg	15:00

C Gas

Open — 19 entries

Bill Hunter	29:19
Bob Hunter	28:54
Bob Isaacson	28:11

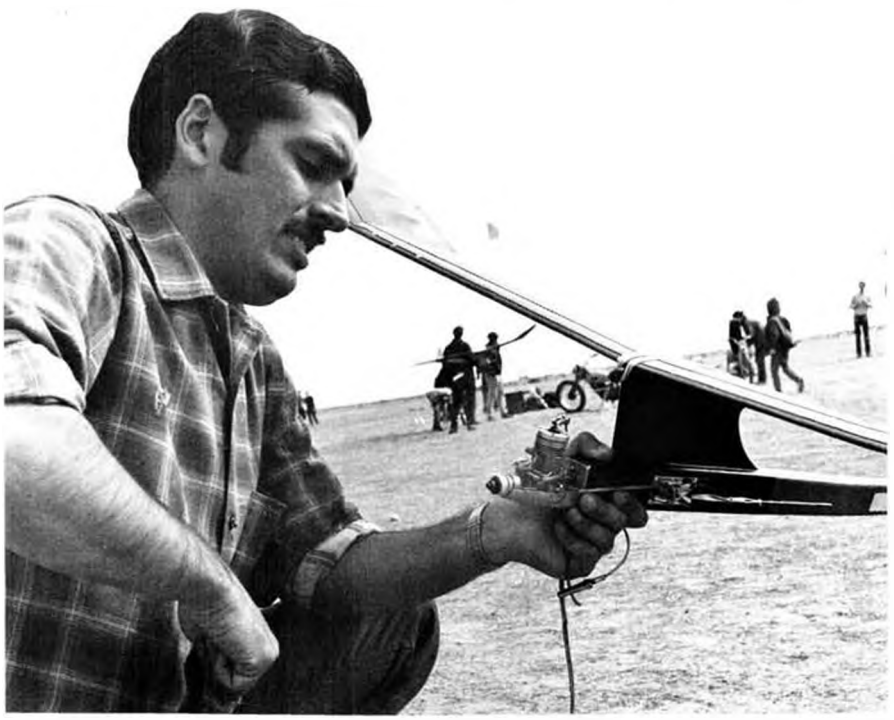
JR/SR — 5 entries

Randy Bunch	14:06
Ray Faulkner	13:51
Keith Wright	12:30

D Gas

Open

Jim Scarborough	19:02
Dick Myers	16:07
Bob Hunter	15:00



Walt Ghio starts up his FAI power ship. Note turbulators applied over sheeted leading edge. Are you smiling, Le Gray? Timer is a Selig four-operation unit. G20/15 Supertiger.

JR/SR

Ray Faulkner	15:00

FAI POWER

Open

John Warren	14:44
Al Vela	14:18
Bill Davis	12:57

JR/SR

Mark Broeg	4:25

A/1 Glider

Open — 16 entries

Chris Matsuno	17:31
Ralph Vescera	15:55
Bob Isaacson	13:05

JR/SR — 11 entries

Jeff Livotto	12:48
Bob Sundberg	11:14
Dan Diez	10:37

H.L. Glider

Open — 13 entries

Bob DeShields	6:00
Bob Isaacson	5:55
George Bahrman	5:36

JR/SR — 15 entries

John Becker	5:51
Mark Broeg	4:38
Ralph Scarborough	4:35

A/2 Glider — 18 entries

Walt Ghio	20:00
Dennis Mihora	19:46
Dee Wood	18:20

Coupe d'Hiver — 16 entries

Mel Schmidt	11:16
Jim Scarborough	10:00
Val Sidlauskas	10:00

Wakefield — 11 entries

Val Sidlauskas	15:00
Ed Orndorff	13:47
Warren Williams	13:32

Unlimited Rubber — 14 entries

Bob White	22:00
John Ferrer	19:30
Jim Quinn	19:19

JR/SR SWEEPSTAKES: Ray Faulkner

OPEN SWEEPSTAKES: Mel Schmidt

Jeff Kirkendall preparing his "C" ship with K&B 40 and Tatone cut-off.

Bob Vinson going for an official in 1/2A gas. Note recording thermal detector on right.

Business end of Paul Ryan's "Shocer." Supertiger .19 provides the urge.

Al Bennet with K&B powered "C" model. Note the flat land at Taft. The hills are better than fifteen miles away. Motorcycles or trail bikes are an important piece of equipment here!

Hal Cover's version of Chet Lanzo's famous Puss Moth rests proudly after completing another winning flight at the NAR Jumbo Scale meet.

PUSS MOTH

One of Chet Lanzo's, and free flight's, most famous designs, the rubber powered scale Puss Moth, returns in all its glory, brought to us by a modeler who is having every bit as much success with his version as did its original creator.

by Hal Cover

Photos by the Editor

We spotted this plane, and its builder, at the recent North American Rockwell Flightmasters "Jumbo Scale" rubber powered contest, and just about snapped our cap. The original model, designed, built, and flown by Chet Lanzo starting around 1939, is probably, ounce for ounce, the best flying rubber powered free-flight scale model to ever romp into the air at a contest. For eight years, Chet and the Puss Moth built themselves a legend, never placing less than third in any meet entered.

Off and on since first hearing about it, we had tried to track down this famous model, but admittedly forgot about it in recent years. It all came back very suddenly when we first saw Hal Cover's version of Lanzo's Moth as it spiralled up in a steep climb, looking more like a competition free-flight in its performance as compared to the more sedate actions of other ships being flown. This, of course, is the key to the Moth's success. Lanzo obviously decided he would put the emphasis on flight capability rather than scale appearance when he designed the Moth. A museum piece it is not. But it meets the AMA rules for rubber powered flying scale and its performance more than makes up for any lack of scale trimmings or deviation from true outline.

Hal's model may vary slightly in some minor detail from Chet's original plane, but the performance is a dead ringer. The dethermalizer set-up is not to be overlooked! WCN

● The key to performance of the Puss Moth is light weight and therefore the balsa wood used in construction should be selected carefully. It is especially important to keep the aft end of the plane as light as practical.

Several changes were made in construction of this modified version of Chet Lanzo's Puss Moth. In addition to beefing up suspected weak areas the plane was built in a manner which allows complete disassembly. The advantages include not only ease of transportation (the disassembled plane will fit in a 7" x 8" x 34" box), but it also permits the various surfaces to be stored on flat press board surfaces, thus eliminating warpage.

The wing halves are detachable from each other, the rudder is removable from the stab and the landing gear may be removed from the fuselage.

The plane can be flown using either a folding prop as Lanzo's original model or with a free wheeler as required by the North American Rockwell Flight Masters 48 inch "Jumbo Scale" rubber rules.

It should be noted the flying trim required is quite different for each type of propeller and the trim requirements described in the "flying" paragraph should be kept in mind.

FUSELAGE

Select hard 1/8 inch square balsa for the longerons. The uprights and cross pieces are cut from medium stock. Place wax paper or Saran over the plans and proceed by building the fuselage sides one on top of the other. This will ensure the best alignment for later construction steps. After thorough drying, remove the sides from the plans and carefully separate using a thin double edge razor blade. Check all glue joints and

Hal cranks in the winds as Carl Hatrak holds on for dear life. Proper care of rubber motors is a most important part of this game. One crank too many and you can't back up!

Moth is off the ground at almost the first revolution of the big free wheeling prop. Power and glide flight are both to the right, providing a smooth transition. Fuselage and rudder are silk covered.

reglue as necessary, then sand both sides of each fuselage half to obtain smooth, flat surfaces.

Next cut 10 cross pieces to the width shown at the front of the cabin (note the fuselage is a constant width from the front to the rear of the cabin). Place one side of the fuselage on the bench, and using a small triangle for reference, glue the ten cross pieces in place making sure they are perpendicular to the fuselage sides. If necessary, small blocks may be used to support them while drying.

When the cross braces are dry, join this assembly to the other fuselage side and allow to dry. Next, join the sides at the tail and put in the nose cross pieces as shown on the plans and check for proper fuselage alignment. Continue by adding the rest of the cross pieces. Next add the 1/8 inch square bottom and side stringers, using medium to light weight stock.

Tack the top nose block in place and carve to approximate shape, then remove and hollow out to approximately 1/8 inch wall thickness. Glue in place and when dry sand the entire nose flat to insure the 4 inch sheet nose former fits flush. Before covering, the upper cross pieces under the hollowed nose block will have to be removed to avoid interference with the rubber motor. Now add the nose former and all necessary gussets and sheeting. Do not add the cheek cowls until the fuselage has been covered and doped.

If a plug-in landing gear is used, epoxy four 3/4 inch long sections of 1/16 inch I.D. tubing to the inside of the fuselage as shown on the plans, positioning them flush with the bottom of the fuselage. Then completely sand the fuselage for proper contour.

The wheels are laminated from 5 layers of 1/8 inch sheet and sanded to a streamlined shape; install tubing or eyelets for axle bearing.

STAB AND RUDDER

The stab and rudder outlines are constructed from carefully selected light quarter-grained 1/8 inch sheet. The ribs are cut from 1/16 x 1/4. Take care that all rib cuts are at right angles to ensure correct fit with the spar and outlines. Fill in between the center ribs of the stab with soft 3/16 sheet as shown. Allow to dry thoroughly, then remove from the plan carefully, sand the airfoil into the stab using a sanding block and 220 grit paper. After final sanding carefully add the 1/32 inch sheet gussets and check all glue joints. When dry, lightly sand the gussets for correct airfoil contour.

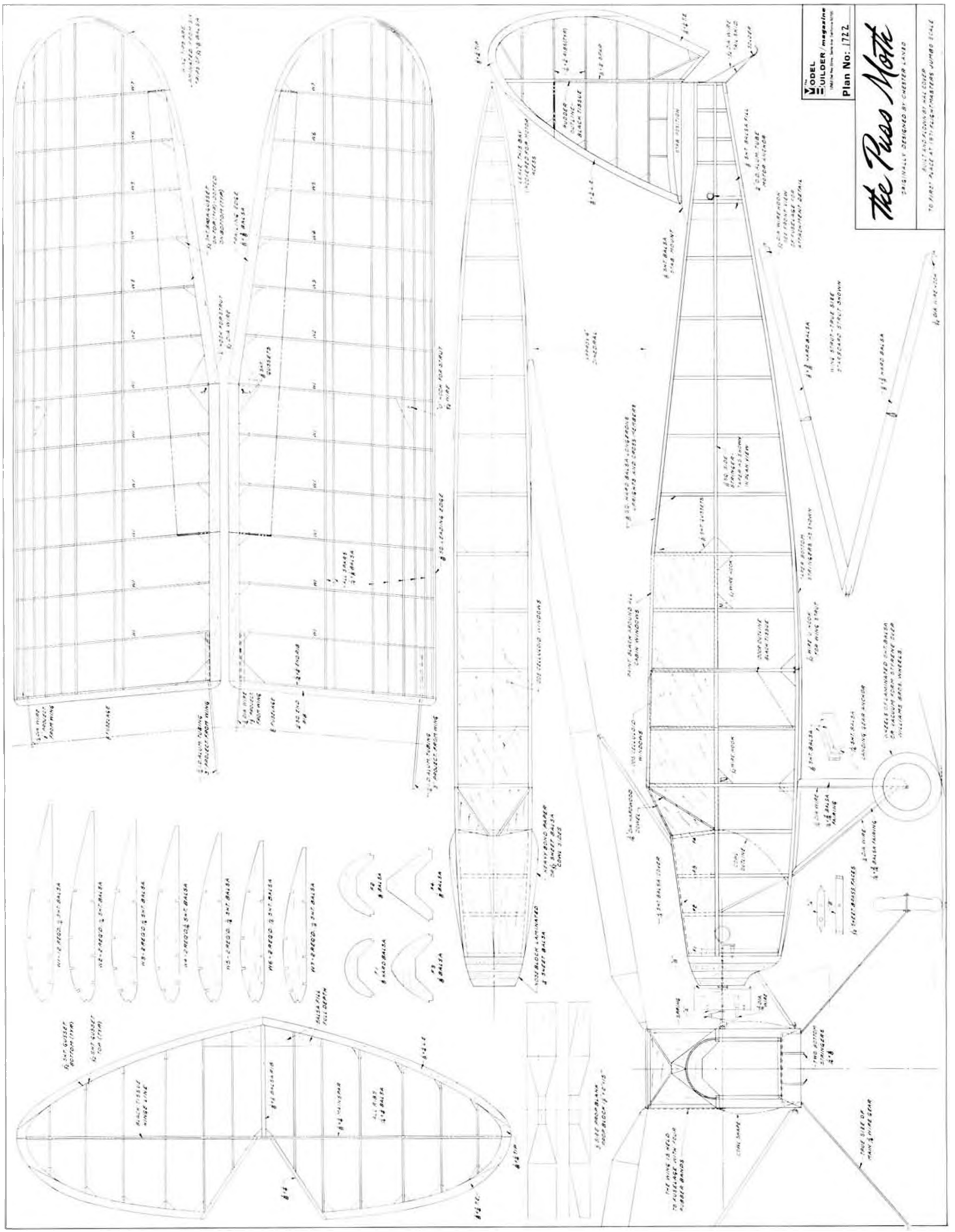
The rudder is built in a similar manner with the exception that the airfoil is symmetrical.

WING

The wings are constructed in a conventional manner. First laminate the tip outline using 5 pieces of 1/32 x 5/32 inch straight grain light balsa. For best results it is suggested that a template of the inside edge of the laminated tip be cut from 1/8 inch sheet. The edges of the template should be smooth and square. Using Titebond, run a bead of glue over the surface of the first laminating strip and place the second strip on top. Repeat the operation until all 5 pieces are together. Carefully press together to remove excess glue. Next place the lamination on a flat surface with the strips on edge and press them into alignment. Quickly position the lamination on the form, making sure there is sufficient laminate outline on both ends and tape one end in place. Gently *pull* the lamination around the form, allowing the layers to slip on each other, but always maintaining tension. When the lamination is completely wrapped around, tape the other end to the form and allow to dry.

Cut 24 ribs the same size, stack together, align the leading and trailing

Hal Cover, the Puss Moth, and the wide open spaces of Sepulveda Basin. A nice combination.



FULL SIZE PLANS AVAILABLE – SEE PAGE 48

Jumbo Scale rules required a free wheeler prop, but the original plane used a folder like this one. Hal finds trim changes needed for each.

A very necessary addition to the original design! We wonder how Lanzo kept the original plane so long without it !

edge and with a pre-cut rib on each end, sand to the correct airfoil and cut in all the spar notches. To obtain the tapered tip rib lengths, mark off the required length and trim off the excess from the trailing edge. Next, put a pencil mark on the trailing edge 1/8 inch down from the rib upper surface. Now place a straight edge on the rib, align it with the back of the front lower spar notch and the pencil mark, and trim off. (See rib template.) The lower spar notches will require re-cutting to the necessary 1/8 inch depth.

Splice the tip outline to the trailing edge and pin in place on the plans. Then glue rib No. 1 to the trailing edge. Splice and glue the leading edge to the tip outline and at the same time glue it to the previosuly positioned No. 1 rib. Using a small triangle to vertically position each rib, glue in ribs 2 through 7.

Next cut the tapered ribs 8 through 12 to length as previously described and glue in place, then attach the 3/8 x 1/4 inch root rib. Glue all the upper spars in place, taking care that they are flush with the upper surface of each rib. Allow to dry thoroughly. Remove the partially assembled wing from the plans, turn over and glue in the lower spars. Turn the wing right side up, and pin to the bench to dry.

Carefully sand the wing to obtain the correct leading edge, trailing edge and tip contours. Add the 1/32 sheet gussets and other required sheeting. Resand when these additions are dry. Fabricate the 1/16 wire wing joiners as shown on the plans, groove the wing sheeting to accept the wire so it is flush with the lower wing surface, epoxy in place using 5 minute epoxy. For best results put two layers of Sig fiber glass cloth over these joints. If you wish a two-piece wing, cut each wire at its center. One-sixteenth inch I.D. aluminum tubing is used for re-assembly with a small rubber bank hooked to each wing half to hold the wing assembly together. Install the strut hooks carefully using 5 minute epoxy.

PROP AND NOSE BLOCK

Carve the propeller from a medium weight block. The method of carving is left up to the individual builder, since describing various carving techniques would result in an article by itself. Assemble the nose block per drawings, using whichever type propeller desired. You will note that on the free wheeling propeller assembly there is a washer soldered to the shaft between the spring and the back of the prop. This allows a tensioning device to be used without loading the propeller.

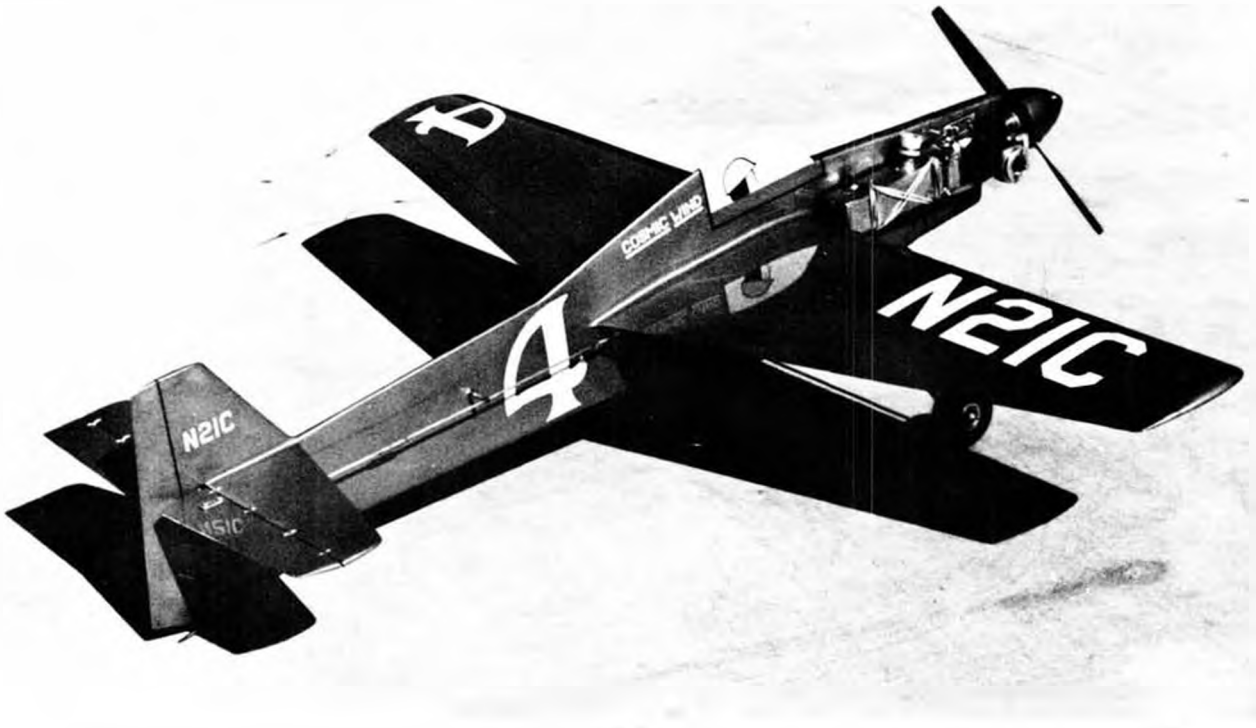
COVERING

Inspect all glue joints and reglue as necessary, then resand all surfaces to remove any burrs. Apply 2 or 3 coats of a 50/50 mixture of nitrate dope and thinner to all surfaces. Lightly re-sand all dope areas using 400 grit paper. The wing and stab are covered with japanese tissue in the normal manner. When water shrinking do not use excessive amounts because it can lead to warps. Apply 3 coats of the 50/50 dope mixture.

The fuselage, propeller and rudder are covered with silk for durability. This type of covering is not difficult if you take your time. Everyone has a favorite method of covering with silk. Here's mine:

First cut the silk to the approximate fuselage side outline. Dampen the silk with a light misty water spray. Use straight dope and tack it to the 1/4 inch nose former. Allow the dope to dry. During the entire covering operation occasionally spray the silk with water to keep it damp. Next attach the silk to the tail end with dope and carefully align the silk grain lengthwise. When the dope is dry, pull the silk to the fuselage top and bottom to remove wrinkles and dope in place. Do not stretch too tight; otherwise the fuselage longerons

Continued on page 42



Profile AMA Goodyear Scale racer by John Penhallow. Ship is Cox .15 powered and has cut-off to predetermine landing spot.

CONTROL-LINE

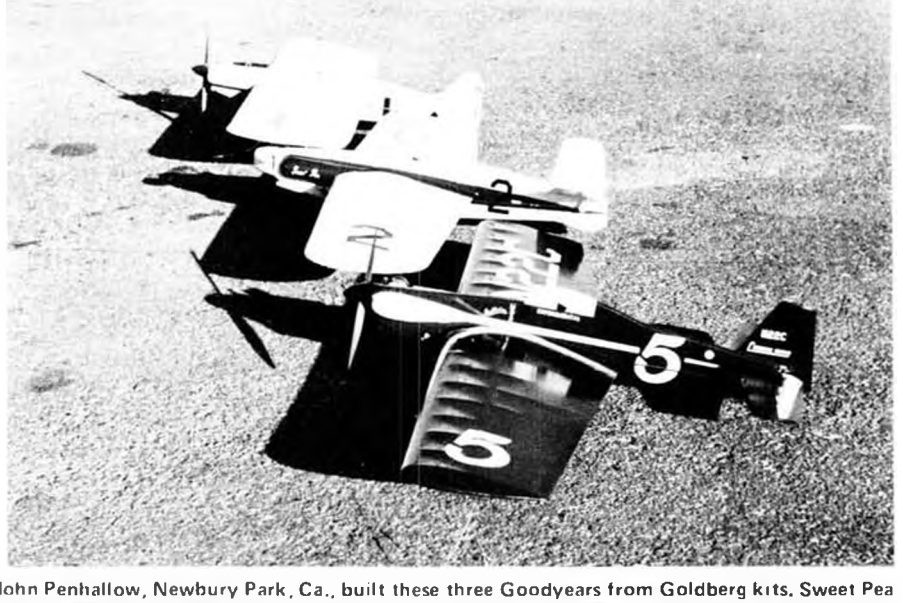
Ahah!! Control-Line at last!! And well worth the wait, for our new columnist is none other than Texan Dick Mathis, who starts out the year with the first chapter from "Fast Richard's Almanac."

● Why am I writing this column? Mainly because nobody ever asked me to do one before, except my Mother, who does not happen to publish a model airplane magazine. I could claim it is because I believe The MODEL BUILDER is a great thing for modelers and Bill Northrop is very inspirational. Actually, Bill is a rather sneaky character whom I suspect is secretly a model railroader. The magazine itself will *have* to be great if it is to survive against the competition of four other established ones, so it will be fun to observe and participate.

Hopefully, my column will not be the final crushing blow to Bill's new mag. Maybe I can cover some things that all the other magazines never get around to. I might even answer letters or questions in it if one of you gets aroused enough to actually send one to the editor, who will then forward it to me in Snider Swamp. We would also be interested in publishable designs if you have one or know of one. We can help with plans, text, and photos if that worries you. This column is also concerned about new products, especially those specialized items by small local manufacturers who do not advertise and whose goods are not known to the average modeler.

The main topic this month is probably the least glamorous of all aspects of control-line flying, except possibly for installing bellcranks. Fuel tanks are inherently ugly and boring, but, for most of us, necessary.

One of the first problems one runs

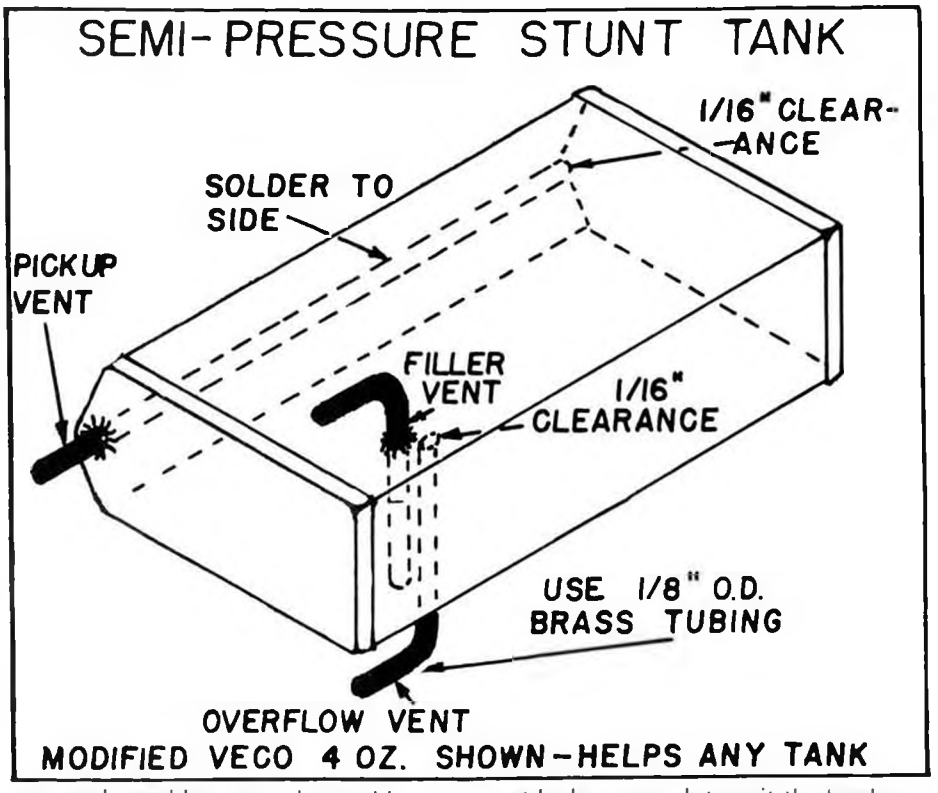


John Penhallow, Newbury Park, Ca., built these three Goodyears from Goldberg kits. Sweet Pea was modified Shoestring kit, Bonzo from a Buster kit, Cosmic Wind took only some trim change

into when learning to fly stunts is faulty motor runs. It's not so thrilling to have the motor quit the first time you try an outside loop, or to have the tank run out of gas unexpectedly (always at the worst possible moment). When I was learning, lousy motor runs probably caused me more trouble in terms of crashed airplanes than pilot error.

There is no need for this to be a problem if you know how to set up a fuel tank correctly. Most commercial tanks can be improved by a few simple modifications. For example, let's take the most popular stunt tank, the Veco 4 ounce. It takes about four ounces of fuel to make a .35 run long enough to do the stunt pattern (about 6 minutes). I wouldn't use less than a 3½ ounce tank even for sport flying, since you want as much flying time as possible. A four ounce tank will run shorter in a profile ship (like a "Magician") than in a full stunter, (say, "Nobler") apparently due to vibration which causes fuel foaming and overflow. In either case, the smoothness of the run can be improved by modifying the tank for semi-pressure operation. The idea is to create a moderate pressure feed to the motor which will give a steadier supply of fuel and minimize the tendency to start out rich on take-off and then go very lean toward the end of the flight. At the same time, slight pressure will keep the fuel in the tank better, rather than letting it blow out the vents as it does in the stock tank, so you have a longer motor run.

You need a good hot soldering iron, an open burner gas stove, a file, and a couple pairs of pliers. Buy a 12 inch length of copper tubing of 1/8 inch outside diameter (copper won't fatigue and crack like brass). Begin by heating up the solder around the stock vents with the iron and removing them with pliers. If you want to be very professional about it, you also need to check the position of the fuel pickup tube. This requires removing the back plate of the tank, which I do just by holding it in the open flame of the stove until it can be pried off easily. Now look at the fuel pickup tube to make sure it rests exactly in the apex of the wedge side of the tank. Also, it's open end should have about 1/16 - 3/32 inch clearance with the back of the tank. Do *not* file a notch in this tube, as so many fliers mistakenly do — it won't help, it will actually reduce the efficiency of the tank. You should assure that the pickup tube stays in position by soldering it to the side of the tank. Replace the end cap and resolder very thoroughly to eliminate small pin holes. Check to make sure the tank has not warped (twisted) during these operations. If it has, reheat the end cap and twist the warp out.



Now for the new vents. You want to bend the tubing so the open vents will face forward into the prop blast. If the tank goes on a profile plane, these vents can be short. If the installation is for an enclosed fuselage stunt ship, they must be long enough to exit the fuselage and clear it by at least ½ inch. Heat the tubing red hot in the open flame and bend, being careful not to let it pinch itself off. Once you are satisfied with the bends, cut off both ends to proper length and deburr them completely. Rough up the tubing where the solder will go, using sandpaper. Blow all the filings out of the tubing.

Insert the tubing through the original

Continued on page 46

Designed by Dick Mathis, built by Steve Helmick of Seattle, and held by Steve's wife (sorry, didn't get your name) is the "Excaliber". Does excellent squares and triangles. Full flaps.

Jack McCracken's beautiful Gipsy Moth makes a bumpy takeoff for the spectators. MB's soaring columnist prepares to move at far right.

JUMBO SCALE!

A photographic report of the 3rd Annual "Jumbo Rubber Scale" meet for 48 inch minimum wing span rubber powered scale models, held on Nov. 28, 1971 at Sepulveda Basin, Van Nuys, Cal., by the North American Rockwell Flightmasters, an all-scale model club.

Winner of the contest was the Lanzo Puss Moth, presented in this issue as a construction article (See page 30).

Curtiss and Walt Mooney prepare Walt's D.H. Humming Bird for an official flight.

Joe Bailey gets ready to wind the motor in his 54 inch Taylorcraft, built from Comet plans.

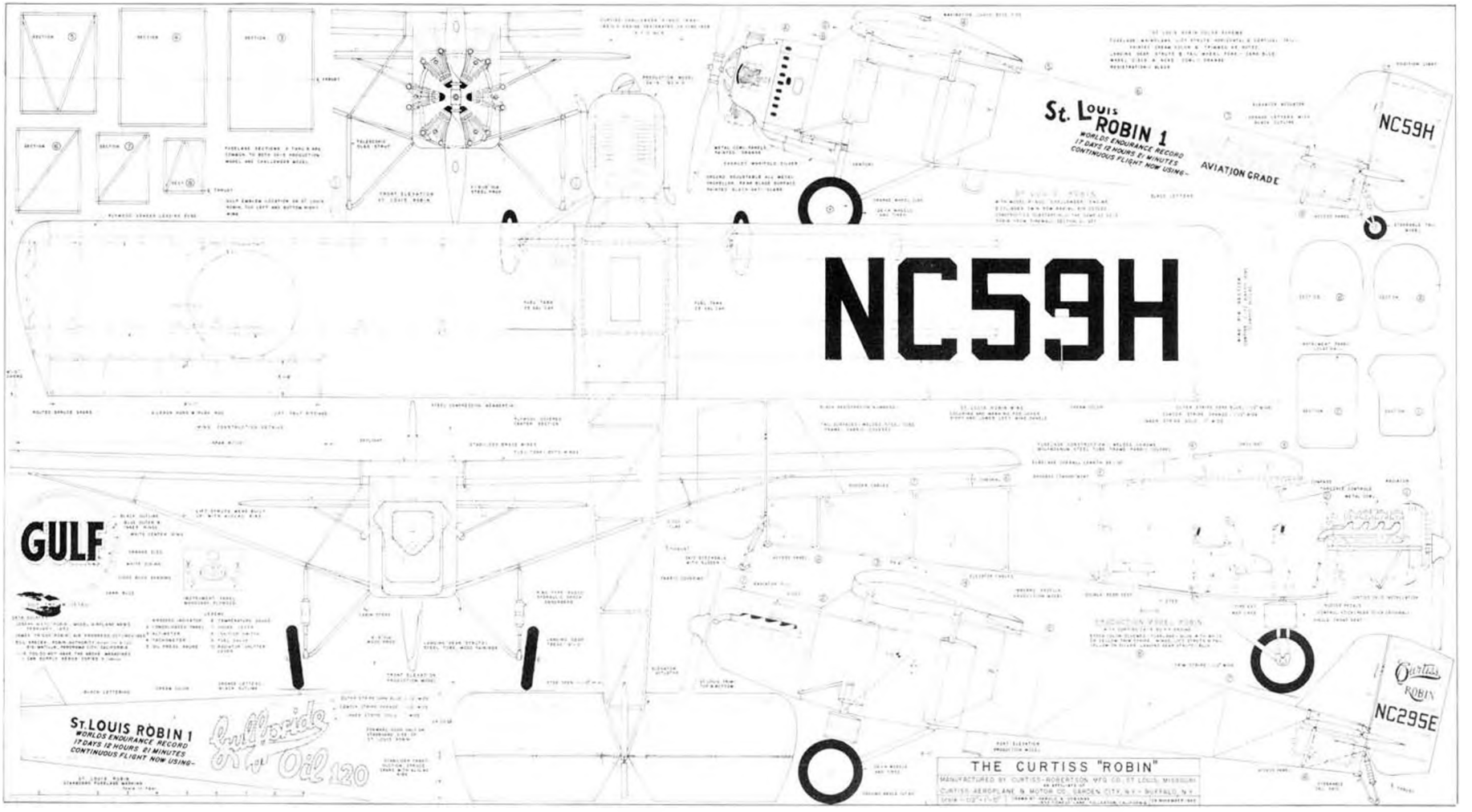
Flightmasters Pres. Bill Stroman smiles even though his knuckles hurt as he holds McCracken's Moth for a winding. Plane flies on floats too.

Walt Mooney releases the Humming Bird as Russ Berrara, Dist. X scale rep clicks the stop watch. Contest flights were plane's first. Usual, yes?

The General Manager poses with Walt's D.H. Humming Bird. Could make nice little R/C.

"Nancy" designer Jack Elem launches Fairchild This was unofficial flight as rules require R.O.G.

"After the ball is over." Ships await static judging, on backs to prevent possible wind damage.



SCALE THREE VIEWS

Available for the first time. . . . Enlarged scale drawings for modeling
The above drawing is an exact reduced sample of the large drawings.

The CURTISS ROBIN

HAROLD A. OSBORNE
1932 CONEJO LANE
FULLERTON, CALIFORNIA 92633

AT SCALE 1-1/2" = 1'–0", 61-1/2" WING SPAN, 550 SQ. IN. WING AREA, PLAN SIZE 3-1/2 by 6-1/2 feet. $3.50 PER COPY
AT SCALE 1" = 1'–0", 41" WING SPAN, 220 SQ. IN. WING AREA, PLAN SIZE 2-1/2 by 4-1/2 feet. $2.50 PER COPY

white trash *Continued from page 19*

own wing tip. It has good speed range. Put the nose down and it penetrates as good as, and better than, most other lightly-loaded thermal machines. Ease back on the stick and it'll slow-fly to feel for the lightest lift. Loop it, spin it, go inverted if you can handle it . . . polyhedral prefers to be upright. If you've got a slope nearby, remove the plug-in wing tips . . . or fly the shortened wing on gusty or strong lift thermal days.

Those tips, incidentally, remove for a very practical reason . . . for easy transport. There just aren't many cars or wagons that can accept a ten foot wing. Remember, Rick built his first "White Trash" before he had a drivers' license. In order to get to contests, he needed a sailplane that would fit into whatever car had an available extra seat. Besides, the wing configuration used on "White Trash" provides an excellent weight-to-strength ratio for the load carrying center section. And . . . it's easy to build.

All up weight is about two and a half pounds. It's a floater . . . no doubt about it. But be ready for a pleasant surprise when you push the nose over.

Look at the drawings. Simplicity personified. Quick and easy . . . and inexpensive. So have at it.

There's one problem, though. After you build your "White Trash", if you don't start winning hardware, all the world's going to know that you're a lousy pilot. Me? I wouldn't touch one with a ten foot pole.

Okay, so let's build one. Take time to look over the drawings. You'll find the construction is beautifully simple, with a direct solution to about everything. A few minutes spent here will clear up most problems, so very little text will be necessary. But, just to cover the high points: *(Gee, Lee, you didn't say the construction is "straight forward." Ed.)*

FUSELAGE

Glue up one left and one right side with the ½-inch corner triangle pieces as shown. If necessary, make a small cut in order to make the bend in the top triangle piece just below leading edge of stabilizer. On bottom triangle piece, make splice joint in the F-2 bulkhead area so as to accomplish slight angle change while extending triangle strip beyond the 36-inch stock length.

When assembling sides, take care to keep all square and aligned. Note that the fin is sandwiched between the aft extremes of the fuselage sides. Add top and bottom sheeting and nose block. Carve and sand to contour as shown in Section A-A.

RUDDER AND STABILIZER

What's to say? Build 'em on a flat surface, and everything will be all right.

WING

First step is to make up the ribs. As noted on plans, the ribs for the tapered portion of the wing are fabricated by using the "Template" and rib W-4 as guides . . . with "raw stock" sandwiched in between, carved and sanded down to shape. Repeat for Tip Panels, using W-5 and W-6 as guides.

Next item is the Wing Dihedral Brace. This goes in early, so might as well get it cut and ready.

Take a look at rib W-1, W-2 and W-3. These pretty well show the basic wing structure.

To build the main panel, position and glue trailing edge, lower leading edge sheeting . . . (note that this only runs to extreme outboard W-3 rib) . . . Lower center section sheeting and bottom spar over drawings. Pin a W-1 rib at wing center, a W-3 rib at the outboard end of lower leading edge sheeting, and the W-4 rib in place. Make vertical measurements at leading edge of each of these ribs, and fabricate the 3/32 sheet, leading edge backup strip with the proper top taper to fit. Use a metal straight edge to get a good, true cut. Apply glue in area of mating lower leading edge sheeting, and pin into place.

Locate dihedral brace over bottom spar, glue and tie down. Note that the right half of the brace will extend beyond the wing center line . . . and will stick up in the air. Okey, it's supposed to at this time.

Glue in all ribs. Locate and epoxy 3/32 ID tubing over bottom spar just inboard of W-4. Fit ¼ inch sheet filler over tubing . . . see detail in Section B-B. Add top spar . . . gluing to top of dihedral brace, all ribs, and the ¼ inch sheet filler.

Trim and sand top of leading edge backup strip to match forward contour of ribs. Add upper leading edge sheeting and center section sheeting. When dry, trim upper leading edge sheeting flush with forward surface of leading edge backup strip. Add 3/8 x 1/2 leading edge.

Remove completed main panel from drawings. Trace through, oil or otherwise get a right panel drawing off of the left panel drawing on plans. Proceed with construction as per above, except when time comes to position and glue dihedral brace over bottom spar, you're going to have a left main wing panel attached to it. Block it up and brace as necessary to establish and maintain alignment during subsequent construction.

Fiberglass dihedral joint at center of two main panels, add ¼ inch sheet end plates, trim and sand to final contour ready for covering. If you're not too lazy, add the hatch/wing fairing block and trim to shape. Fabricate wing tip panels in manner similar to main panels described above.

Note that the drawing shows a single 3/32 music wire pin plug-in arrangement for each tip panel-main panel joint. If you prefer, a second and similar pin-tube arrangement can be located just aft of the leading edge. However, the design as shown works fine with tape . . . masking or otherwise . . . used to complete the joint. That is, the joint is "taped" top and bottom and

around leading and trailing edges. The alignment holds, so don't worry about it.

TOW HOOK

The easy way out here is to suggest you use your favorite tow hook arrangement. However, if you don't happen to have a favorite, "White Trash" uses a piece of aluminum angle filed as shown, with two holes for sheet metal screws in the "base". Unless you're quite experienced with sailplanes, it might be a good idea to cut the notch a little . . . say 1/8 inch deeper than shown. Just be sure your hook is clean and free of burrs that would hang on to a tow ring. A non-releasing tow-hook can spoil your whole day. So can a premature release, so go the extra 1/8 inch, and be safe.

CANOPY

Note that the canopy hatch assembly uses a dowel to locate and secure the forward end to the fuselage. At the aft end, use a strip of tape, a rubber band across the top from the forward wing hold-down dowels, or an internal rubber band between hooks secured to bottom of hatch and floor of fuselage. Or, carve a soft balsa block to shape, paint it black or silver and you'll never know the difference when it's in the air.

COVERING

The original "White Trash" was covered with silk, but subsequent versions have been MonoKoted. T'would seem it's up to you.

ASSEMBLY

Install your gear, mount all the parts together. Shim and/or key as necessary for alignment. Check it out before you head for the field. Everything square and true . . . no warps . . . controls move the right direction? Are you sure? Check again. It might be worthwhile. The original "White Trash" was flown by very capable pilots, so was set up with gobs of control "throw" . . . 1¼ inch either way from center for rudder, and 3/8 inch up or down from neutral on elevator. You may want less to start out with.

Flying: Check CG . . . correct as necessary with ballast or by shifting gear to get the position shown on drawings. Try a couple of hand launches . . . run and throw . . . that's RUN and THROW . . . into wind. It should have enough excess speed upon release to climb, so be ready to get on the sticks and get the nose down before it stalls. Never launch without radio control ready and working.

From here on in it's up to you. Trim it as you see fit . . . but probably the best advice is to just fly it and fly it and see just what it will do at various settings before you "l ock in" on a fix.

And in conclusion, you might be interested in one more unsolicited commercial. If so, here's a letter that pretty well wraps it up:

Bill,

Got a frantic call from Le Gray this morning, asking me to send you any photos I had immediately available of Rick Walters. Out of literally hundreds of glider shots, only one featured Rick and "White Trash". This is extremely typical of the attention the "old dog" gets on the flying field. Even when Rick receives trophy after gleaming trophy ad infinitum, ad nauseum, it is Rick himself who gets the applause and the attention. Everything is attributed to his piloting skill, and nothing to his very real, but not obvious talents as a designer-builder. Like the "Rambling Wreck from Georgia Tech," Rick is one helluva engineer . . .

Two weeks ago something happened up here which directed the spotlight of public attention more toward "White Trash." Our S.B.S.S. contest featured a typical series of events: A precision task, with runway landing, a speed task over a closed course, and a duration round with precision landing. On its first flight, my Amigo II, borrowed by an old friend and fine pilot, lost a nose-to-nose competition with one of the flying field's ubiquitous telephone poles. Rick lent me "White Trash" as a back-up. I was quite apprehensive about flying same, since I'd never even looked closely at it, much less flown it.

To make a long story short, we finished one-two with it. Rick defeated me by 14 points out of a possible 1500 or so. We beat the usual gleaming and fabulous collection of kits and homebrews. Interestingly, "White Trash", renowned as a "floater", tied a Cumulus in the speed task with Rick at the transmitter, while I got lucky and out-raced it by one second. My impressions as a pilot, while flying "White Trash," albeit briefly, can be summed up in one word: Wow! This thing is *super* sensitive on both rudder and elevator, but is not the least bit squirrelly or unpleasant to fly. It will free-flight, with no attention to the controls whatever. Just for me, I like them quick on the stick, but for beginners, for the bird's sake, cut down the control throw.

I was very pleased to hear that this design is finally being written up and published. You can bet there are a lot of old timers, as well as new starts, who will want plans, but who, like me, would never be able to summon up the nerve to ask Rick for them. *(They won't need nerve now, just MONEY! Ed.)* Also hope that the "hotshots" who see the plane in your magazine won't think it just another "conventional" overgrown Nordic. There is nothing conventional about its performance! It's a labor of love on Rick's part. The original prototype has been flown, repaired, modified, extended, lightened up, leaded down, and flown some more. For literally years. Rick won the 1971 S.B.S.S. Season Championship with it, as he did in 1969. In 1970, he slipped to second. Shame!

Best of luck with the magazine!

Keith Brewster
L.S.F. 002 ●

Soaring ... *Continued from page 22*

work to...1/6th full size which is 2 inches to the foot...wing area is usually inadequate to provide an acceptable soaring capability for the resulting all-up weight of the model.

Just as there is no "average" man, there is no average sailplane. However, most full-size, Standard Class, 15-meter sailplanes of modern vintage have wing areas in the range of 125 to 150 square feet. At 1/6th scale, this will result in a model with a span of approximately eight feet...a popular and convenient size...and a wing area of around 3.5 to 4.0 square feet. But now for the hooker. In order to maintain a wing loading in the 8 to 10 ounce range, the models must weigh in at around 2.5 pounds, ready to launch. Any heavier and you get a lead-sled...which is fine for slope soaring, but wear a hard hat if you're under one that's trying to thermal. Unless conditions are quite "strong", that is. This weight-to-size relationship is not impossible to attain, but two things are evident. First, it ain't easy. Secondly, the model probably won't take much roughing around. The solution, then, has been to "cheat"...or, a bit kinder...to compromise from true scale in order to obtain adequate performance potential.

Oddly enough, the resolution of whether to build to "true" or to "modified" scale outlines appears to be in the selection of the scale. The 1/6th size seems to have gotten off to a running start. If we're not careful, it may become "standard". Most designers will agree that except in very special cases, any size less than 1/6th is really too small for efficient R/C sailplanes that are expected to thermal. And most also believe that 1/4th size...3 inches to the foot...results in an overly cumbersome airframe. At 1/4th scale, a model of a Standard Class sailplane will have a wing span in excess of 12 feet, and a fuselage that is absolutely cavernous. Great sport and great fun...but rather outsized for most normal activities. There seems to be a compromise, however, that can work...1/5th scale which is 2.4 inches, call it 2-3/8 inches to the foot.

Let's see what happens to our model of a Standard Class sailplane when it's built to this 1/5th size. First, the wingspan will work out to approximately ten feet...an increased, but still workable size. But check that wing area. It jumps to 5.0 to 6.0 square feet! To keep wing loading at 8 to 10 ounces, the all up weight now can be upwards of 3.5 to 4.0 pounds. An obtainable target. Fuselage size will increase a bit...about an inch in width and 8 or 10 inches in length, but that.s not unreasonable. The dramatic change is in wing area because it increases by the square...by both length and width...and that adds up fast. One other "plus" factor for 1/5th scale is that it's quite convenient and easy to use in the metric system, which is the

Shocer .... *Continued from page 10*

surfaces. Too much right rudder will also add to the problem.

g. The ship is launched under full power on a 10 second motor run and climbs in a nice, open, 360 degree spiral to the right. Following engine cut the ship's momentum carries it on up until it abruptly rolls out into a flat glide without stalling or loss of altitude. Dismantle the ship, pack up, and go home. You're ready for the next contest! ●

basis for European sailplane dimensions.

But let's get specific. What's your favorite full-scale design? It's probably listed in the accompanying table. Let's say it's the beautiful, new Schempp-Hirth Standard Cirrus. As you'll note, it's down near the bottom of the list, which means it has a relatively small wing area since the various sailplanes are arranged by wing area in descending order...biggest one first, littlest one last.

Checking the table, Column 1 gives full-scale span as 49 feet, Okay, so the wise guys will notice that 15 meters is 49 feet, 2.60 inches. But for our purposes, the 49 feet listed in the table will suffice, Column 2 gives the full-scale wing area as 108 square feet, and Column 3 the maximum gross weight as 728 pounds.

If we decide to build our model Standard Cirrus at 1/5th size, span will be 118 inches...just a skotch under 10 feet.. and wing area will be 4.3 square feet. Just for interest, notice the next two columns, 6 and 7. They show what scale weight and loading would be...based on cubic relationship to full size values. Of more direct concern are Columns 8, 9 and 10. These show, respectively, the weight of our model at 8, 10 or 12 ounce wing loadings. To be specific, our little 10-foot jewel will have to weigh in at 2.2 pounds (35 ounces) to hold wing loading at 8 ounces per square foot of wing area. Likewise, 2.7 pounds will get us a 10 ounce loading, and 3.2 pounds a 12 ounce loading. Quite a challenge. But check the numbers for 1/6th scale.

At 2 inches to the foot, our little dandy will span 98 inches and boast a total wing area of 3.0 square feet (432 square inches). Now hang on. To get an 8 ounce loading, our 8-foot Standard Cirrus must weigh no more than 1.5 pounds! Or we could get beefy and settle for a 10 ounce loading at 1.9 pounds. Or let's go crazy with hardwoods and paint and let it climb to 2.3 pounds for a 12 ounce loading. Wow! Definitely not a project for most of us ordinary balsa hackers.

Quite a dramatic difference between 1/6th and 1/5th scale. But the example used also pretty well indicates that the Standard Cirrus doesn't carry enough wing area to develop an accurately scaled, thermal soaring model. A shame. It's a real beauty. Should be great as a slope soarer, though. Just for comparison, it's interesting to note that the popular Graupner "Cirrus" model kit carries 5.65 square feet...806 square inches...and can weigh 3.5 pounds before topping a 10 ounce loading. Midwest's "Lil'T" has a 500 square inch wing...3.5 square feet...allowing a little over 2 pounds for 10 ounces per square foot of wing.

Let's try again. How about a Standard Austria? Not the most modern design off the boards, but still a sleek beauty. It's Number 22...about mid-way ...on the table.

Checking Column 4, the Standard Austria's span at 1/5th scale is the same 118 inches, but the area as listed in Column 5 is up to 5.9 square feet! At this size, our model can weigh up to 3.7 pounds and still hold a 10 ounce loading. That's starting to sound reasonable. Yet back at 1/6th scale, we're fighting for 2.5 pounds to get a comparable loading...and that's tough.

The samples we've used have both been Standard Class sailplanes...to keep things simple. Incidentally, in the international regulations, Standard Class sailplanes are limited to a 15 meter wingspan.

Larger planes compete in Open Class. There are no classes that have been officially established for R/C sailplanes...although some CD's identify 100 inches as a maximum span for "Standard" class and "anything goes" in Open. Note that the model "Standard" class span limitation approximates the span...98 inches ...of a 1/6th scale Standard Class sailplane. And that's how it was originally set...rather arbitrarily...at the formation meeting of the since defunct National R/C Soaring Society. Just one of those things that kinda got started and then just kinda hung on.

Now for a minute, let's look at a non-Standard Class machine. Check that old Schweizer TG-2 design. Here's an American classic...and many still flying.. used as a glider pilot trainer in World War II...a two-holer with all the character and personality you could ever want...and even U.S.Army Air Corps markings could be authentic. At 1/5th scale, span is 125 inches...just a smidgen over 10 feet...and area is 8.6 square feet. Whoopee...a big 1,238 square inches. And weight? No sweat. Almost 5.5 pounds are to be filled up before we cross a 10 ounce loading.

Spend a little time with the table. You may find it interesting...you may even find something you like. But be careful, it could get so bad you might even get up and do something. Now take "Minimoa" for example...or that "Skylark 4". Now that would really be something.

See ya on the field.●

Puss Moth .. *Continued from page 33*

will bow in from the excessive silk tension. Remember, cover *just* tight enough to remove wrinkles. When the dope and silk are dry, run a bead of dope completely around the outer edge of the frame. When dry, trim the excess silk off using a clean sharp razor blade. Cover the rest of the fuselage using the same procedure.

Doping silk can be a real headache, and if you are not careful many large runs will develop. The secret to doping silk is to use a thin 50/50 mixture of nitrate dope and thinner. With a moderately loaded soft brush, lightly brush over the silk, make only one pass, and do not overlap brush strokes. If you re-brush any areas you will push dope through the silk and it will run on the inside causing spots when dry. Three or four coats applied in this manner should seal all pin holes. The rudder is covered in a similar manner, but again, don't pull the silk too tight or the rudder will warp. Detail trim and letters are applied using black tissue doped over the surfaces.

CHEEK COWL

Cut the cheek out of straight grain 1/32 sheet. Glue the 1/16 sheet former in place as shown on the plans. The cowl is now attached to the bottom of the fuselage at about a 45 degree angle to the fuselage side. When the glue is dry, moisten the outer surface with water so it will bend easily into position, trim for proper fit, feather edge the top and glue in place. When dry, sand and cover with silk. Apply 3 coats of dope for final finish.

MISCELLANEOUS DETAILS

The wing struts are made from medium hard 1/8 x 3/8 balsa, they are sanded to a streamlined shape and covered with tissue. Epoxy hooks B and C in place, reinforce with epoxy cloth.

ASSEMBLY

The wings plug into 3 inch long pieces of 1/16 inch I.D. tubing with two small bands used to pull the wing together. The wing is banded to the fuselage by looping one rubber band over each corner of the two wing wires and hooking to the side fuselage hooks. The landing gear is plugged in and attached with small bands. The rudder is bolted to the stab and this assembly is then rubber banded to the fuselage. The struts hook into the wing and then are clipped to the fuselage.

FLYING

Weigh out 3 ounces of 1/4 inch Pirelli rubber and make up into a 14 to 16 strand motor, lubricate and braid the motor. Assemble the plane with the motor and balance four inches back from the leading edge. Check all surfaces for warps. All surfaces should be flat except the right wing which should have 1/8 inch wash-in (wing trailing edge 1/8 inch lower than leading edge). Warps may be removed by holding the surfaces over a steaming kettle and twisting them opposite to the warp.

The plane is flown to the right under power and in the glide with either the folding propeller or the freewheeling propeller. Adjustments for flying with the folding prop include no down thrust and no right thrust with right rudder. Adjustments for the freewheeling include 4 degrees right thrust and no down thrust with left rudder. The left rudder is needed to overcome the natural light right turn caused by the additional drag of the freewheeling propeller.

Glide the airplane by gently tossing it at a spot 50 feet in front of you. If it stalls, add a 1/32 inch balsa shim under the stab leading edge. If it dives, add the shim to the trailing edge. Obtain a wide right circle using a rudder trim tab. When a smooth right hand glide is obtained, try about 100 hand winds, launching with the nose pointed slightly up. The power pattern should be adjusted with necessary side and down thrust, don't use rudder or your glide pattern will be upset. The correct pattern should be an approximately 150 foot diameter circle with a stall-free climb. Add any necessary thrust adjustments 1/32 inch at a time. (A shim on the left side of the nose block for right thrust which will turn the plane to the right. Shims on the top of the block will stop stalls.) Slowly increase the winds in the motor, making necessary changes as you go. The motor described, when winder-wound, should take 500 to 600 turns safely.

With maximum turns in the motor

and a properly trimmed airplane, flights in excess of two minutes are common and as a result, it is advisable to use a thermalizer. (Note, the author "maxed out" in the last scale meet and would have lost the plane except for its dethermalizer.) Good luck and have lots of enjoyable flying hours with your Puss Moth. ●

WEIGHT OF COMPONENT PARTS

Prop	38 grams
Landing Gear	35 grams
Stab	9 grams
Rudder	6 grams
Wing	54 grams
Fuselage	92 grams
Struts	10 grams
Rubber	80 grams
Total	322 grams = 11.3 ounces.
Wing Span	52 inches
Wing area	300 sq. inches
Length	35 inches

Mooney.... *Continued from page 23*

don't really count, it has twice flown for more than 15 minutes, which is good if you like the exercise of chasing it. After conversion to CO-2 it has averaged more than a minute and a half with several flights of over two minutes and two officials of over four minutes at the last Orbiteers scale contest.

The license number on the side of the model is my imagination, I don't actually know what the real series of letters is, so I used a little license, if you'll pardon the pun, to come up with these.

The structure of the rubber powered version is so much the old standard system that only the differences from standard practice will be discussed. Hard 1/32nd sheet can be used for the struts and landing gear fairings if that's all that is available; however, on the model shown, they are 1/64th Sig plywood. Cement the landing gear fairings to the bottom of the fuselage but not to the landing gear wire. This leaves the wheel and wire free to flex and will save your structure.

The sides of the cowl are 1/32nd sheet cemented to the outside of the main frame. The top cowl is also 1/32nd sheet carefully wrapped around Formers 1 and 2. The bottom of the cowl is carved from 1/8th sheet balsa. Note the shape of the propeller hook. This shape seems to work as well as the "S" hook type and is much easier to bend. The shock absorbers shown on the plan were never installed on the model in the photos, but are on the airplane.

Peanut Scale rules do not require R.O.G. takeoffs, so a Williams Brothers propeller can be used as is. If you want your model to take off, however, it will have to be shortened. All the flight times quoted for the rubbered powered version were wound with an indoor winder so don't forget a winding loop at the propeller.

Build the wing by pinning the leading and trailing edges to the plan and cementing the 1/16th square rib bottoms in place. Cut out the two spars and starting with the left hand wing cement them in place on top of the rib bottoms. Slice the rib tops, using a cardboard template for a guide, and cement them in place on the left panel. Fit and cement the tip in place on the left panel. When this is dry, cut the leading and trailing edges for the left hand dihedral break and elevate the tip so the spars can be cemented to the center rib bottoms. Cement the left dihedral breaks and cut the right ones in the leading and

peanut....

trailing edges. Now further raise the left wing so the spars can be cemented to the rib bottoms on the right hand panels. Cement the rib tops in place and the right hand tip can be installed. After this assembly is dry, sand the leading edge round and taper the trailing edge as shown in the side view.

If a CO-2 model is to be constructed, make the body structure from 1/32nd sheet balsa. (The rubber powered fuselage can be made this way if desired, it was on the photo model.) With the exception of the fuselage, all the rest of the model is identical with the rubber powered version. The basic differences are all due to the motor installation. Make the basic fuselage structure using two rectangular formers in the cabin area. (See the front view for their shape.) Cover the fuselage top and bottom with 1/32nd sheet with the grain crosswise to the fuselage. Install a hard 1/16th doubler between the landing gear struts in the fuselage bottom to support the filler connection. Install the tank at the angle shown so solid CO-2 will not flow into the engine. Cut the motor mount from one sheet of 1/16th ply and one sheet of 1/16th balsa. They may have to be fitted and trimmed depending on the exact shape of the upper cowl sheeting. Mount the engine to the ply with pins and bend them over on the back side. Cement the mounts in place making sure that the engine is properly aligned with no thrust line offsets. Finally put the cowl bottom in place leaving a hole for access to the engine. The scale cowling holes should be used to provide an airflow over the engine.

The model should balance 3/4th of an inch behind the wing leading edge. ●

Pylon.... *Continued from page 14*

John admits that one out of five stock engines he tests will substantially outperform all others. This is a fact of life with production engines. When a flyer orders a "customized" engine from Clarence Lee, George Aldridge or any other engine expert, he is essentially getting a guarantee that his engine will be among that top 20 percent. It is much cheaper to buy a customized engine than to buy several stock engines and try to find that one engine in five.

The best recent idea to involve a wider segment of modelers in pylon is 1/4 Midget Pylon Racing. The present rules for this event seem to provide a class of racing which would be relatively inexpensive, easier and slower to fly, and an event that the novice racing pilot needs. The AMA and NMPRA should probably get behind this event and give it the leadership it needs. Quarter Midgets seem to be the best way for novice pilots to "get their feet wet" in racing and would eventually lead to more Formula I and FAI pilots.

NEW K&B ENGINES

It has been generally agreed that the K&B 40RR has reached a point where further modification will no longer get more power from the basic design. The tremendous success of the Super Tigre 40 in the 1971 season and the recent introduction of the HP40 have left many K&B 40 users uncertain about what to do for next season.

K&B has therefore decided to produce the Schneurle ported engine with which they have experimented for the past year and a half. I have seen the performance curves for the new engine and they seem to indicate that the new engine will power many winners next season. The basic dimensions of the engine are the same as the present K&B 40. The front end length and cylinder head height are the same, with the cylinder diameter being only slightly larger. K&B will produce 100 of these engines by the end of February and plans to "play it by ear" after that. K&B is uncertain about production plans after February and would like to see NMPRA (and AMA) engine requirements increased to well over 100 production engines. No matter what happens, the competition should really be hot next season.

K&B will also soon go into production of their new Schneurle ported .15 for 1/4 Midget racers. This powerful little engine will probably dominate its class. No firm prices have been set by K&B for either of their new engines.

NEW RUSSIAN SPEED RECORDS

It seems that the Russians have decided to try their hand at setting R/C world records again, and have succeeded. During one week last September, the USSR set three tentative world speed records in radio control. The most important record was set by the team of Goukoun and Myakinin when they flew at an almost unbelievable speed of *213.7 mph.* This same team also set a

record for R/C seaplane speed with 183.6 mph. A. Dochim set the glider speed record with 113 mph. All of these records will be very difficult to beat and must have been the result of a maximum effort by the Russians. I have no details about the records but I have heard a rumor that they all used Kraft radio equipment.

The Russian records present quite a challenge to the speed specialists in our country. I know that several prominent pylon racers plan to make attempts at the world speed record this year. They had planned to break Germany's 198 mph record, but now a successful attempt will be much more difficult to accomplish. I want to wish everyone who attempts to break the new record the best of luck. I'm sure that the fact that it is now a Russian record will provide a little more incentive. It could be very interesting in the future if the Russians should try their luck at FAI pylon racing too.

TUCSON 1971 WINTER NATS

This RCM sponsored meet lured 46 Formula I to Arizona and was blessed with pleasant weather for the second year in a row. The Tucson R/C club upheld their reputation for pylon racing organization and everyone seemed to have a good time.

Whit Stockwell, a former National Champ who almost became a former racing pilot this past season, made the comeback of the year by walking away with first place. Whit showed the determination at this contest which had brought him to his past glories. He even had his hair cut! Whit was flying a Super Tigre powered Shark and had a fast time of 1:43.5.

After all these years!! The story of Samson's haircut is disproved. To wit; Whit Stockwell.

Dan McCan won all of his heats, except the first when his engine quit on takeoff, and came away with second place. Dan flew a Miss DARA with an HP 40 up front and had the fastest time of the meet with a 1:41.1. He flew the smoothest course at the meet and demonstrated convincingly the potential of the new HP engine.

NMPRA's new president, Bror Faber of the Nupen/Faber team, was his usual fast, consistent self and placed third. Mike Barna, who placed fourth, had far from the second fastest airplane but still had the second fastest time of the meet with a 1:42.0, which is a tribute to the smooth, tight course he is capable of flying.

Ed Hotelling, who won the F.A.S.T. Club's rookie race last August, made his best showing ever in Formula I with his fifth place finish. He accomplished what few people have done this season he beat Terry Prather in a very close race that was really exciting.

Ed Rankin lead a large contingent of pilots from Texas, and captured sixth place. Al Strickland's year of bad luck finally ended with his seventh place finish and a time of 1:44.6. It was good to see Big Al get back into the groove again.

Everyone appreciated the Tucson R/C Club's job of hosting the meet and is looking forward to coming back in '72. ●

RESULTS — 1971 TUCSON WINTER NATS

	Name	Time	Engine	Aircraft	Points
1.	Whit Stockwell	1:43.5	ST	Shark	26
2.	Dan McCan	1:41.1	HP	Miss DARA	24
3.	Nupen/Faber	1:45.0	ST	Miss Dallas	23
4.	Mike Barna	1:42.0	K&B	Minnow	23
5.	Ed Hotelling	1:44.0	K&B	Shark	22
6.	Ed Rankin	1:49.1	ST	Mustang	20
7.	Al Strickland	1:44.4	K&B	Cosmic Wind	19
8.	Lee Frey	1:47.6	ST	Miss Dallas	19
9.	Ron Schorr	1:53.6	K&B	Shark	19
10.	Terry Prather	1:45.0	ST	Shark	18

1/4 pylon.... *Continued from page 15*

starting line, once all engines are running (1½ minutes maximum) starter shall require a 10 second idle period prior to flagging off.

A LETTER FROM BOB PENKO

In 1969 the MARCS Club of Mentor, Ohio decided to develop the Quarter-Midget rules, aimed at a racing event for the majority of R/C flyers, an event that would be kept simple.

Ed Nobora, present Q. M. World Champion, built a Cosmic Wind to the rules as suggested in RCM, and let almost everyone in the club fly it. We all were impressed with the good flight characteristics and the docile landings one could make with it.

So, we held a contest in which nine Q. M. planes were entered. That was five more than we had at our first Formula I race, and with an unofficial event yet!

After that first race, during which we had a lot of different opinions on how the rules should be changed, we sent out questionnaires to all who entered, and to other prominent flyers in the area. The end results are the rules we have today — practically no change since the initial rules were set up.

I understand the groups in California have slight variations of Q.M. rules. Basically the same, but I'd like to present our reasons for writing them as they are.

First, Wing thickness: Object here was to keep the speed down (Ed Nobora clocked 2:05), and keep the wing strength up We also wanted to encourage a possible miniature retractable gear, which has since been done. *(Most comment seems to be in favor of disallowing retract gear. WCN)* If you adopt a "minimum wing thickness at the root", you have ultra thin tip sections and, as in Formula I, the possibility of wing flutter, resulting in wing failure. At the same time, a tapered wing planform has an advantage over a straight planform, and you need a separate rule to cover bi-planes to encourage them. The 5/8 inch thickness does not give them enough advantage to bother with them, whereas a percentage of wing chord accomplishes all these things. We adopted 10 percent as an easy ratio to work out.

The width of fuselage (2-3/4 inches) and minimum weight of 2-1/2 lbs. were adopted because some people still have older, larger equipment, and that way it wouldn't be necessary to go out and buy a mini-set to be competitive.

Besides, they look more scale if not

too thinned out. A 4 lb. maximum weight was mentioned; however, maximum weight is self-governing. Heavy models are slow, sluggish, and have difficulty taking off from grass fields. But it doesn't hurt to have the rule in there. I only mention it because we wanted to keep the rules simple, and if a rule isn't necessary, leave it out.

As to the engine, this one ruling took the most time to resolve. As any racing rules committee will tell you, "stock" is the hardest to define and police. However, we decided that most R/Cers are a sporting bunch, and if we said "stock" their honor would take care of that. So far, it has. We did kick around the idea of arbitrarily calling for one particular engine, such as the OS15, but felt that this would squelch other manufacturers' incentives. The Super Tigre 15 has since come out, we feel, because of the demand for a good 15 R/C. K&B will have an idling .15 for 1/4 midgets in a few months.

We did come up with an excellent way to police the engine rule. We simply required that the Q.M. had to land with power on; that is, stop rolling with the engine still running. We only required one landing, after any one of the heats, in order to qualify, but that had two drawbacks: (1) A flyer could do real well, but due to dumb luck his engine would quit on landing or he'd hit a rough spot on the field, etc., and so be completely out of the race. Too harsh! (2) It also was written so that if a flyer got his landing in on the first heat, there was nothing in the rules that said he couldn't change fuel, props, pressurize or even change engines in later heats. All of which we wanted to eliminate.

In 1972 we will require the power-on landing after each heat--a penalty of 20 or 30 seconds to be added to the time for that heat for failure to do so. The winner is based on the two best times averaged, so you really only need two landings. These are the basic differences in the MARCS rules and the west coasts'. We feel both the 10% wing thickness and the power on landing rules are excellent and strongly urge that they be adopted nationwide.

We are delighted that "The Model Builder" is acting as a clearing house for quarter midgets, and would like anyone interested in Q.M. racing to write to this magazine.

Yours truly,
Bob Penko ●

C/L . . . . . *Continued from page 35*

vent hole and push it in until the end makes contact with the tank surface. Then back it off about 1/32 - 1/16 inch. Solder in this position and repeat for the other vent. The open ends should face straight forward.

Now wash the tank thoroughly with alcohol inside and out. Check for leaks by plugging off all but one opening and sucking on the open one (a squeegee bulb is good for this) to see if the tank will hold a vacuum. If it doesn't, you have a hole somewhere. Locate it by submerging the tank in water and blowing into the open vent. Bubbles indicate the offending hole. Resolder, but be sure the tank has aired out from the cleaning gas or you may have manufactured a small bomb!

The next step is a good solid, well-aligned tank mounting. In all cases, the tank should be placed so it's pick-up vent is perfectly level with the engine's needle valve. In the case of profile ships, this means the center of the carburetor venturi. The tank itself should be perfectly level with the airplane level. Even with maximum care here, it is not always possible to have perfect alignment. This will show up once you start the motor and listen to it run both rightside up and upside down. If it runs faster rightside up, the tank is too low. On profiles, the tank can be simply raised by shimming the tank itself. On stunt ships where the tank is already sealed inside the fuselage, you can change the level of the engine by either removing material from the motor mounts or installing washers under the engine mounts.

It is a good idea on a profile ship to install hardwood keys on the side of the fuselage to keep the tank from shifting. To fill the tank, use the top vent and make sure the ship is level. A solid stream of fuel should come out of the bottom vent to indicate the tank is full. Now take a five or six inch length of tubing and put it over both vents until you are ready to crank up. To start, remove the tubing from the top vent and hold it against the fuselage. This will prevent fuel running out the bottom vent. Once the engine is running remove the tubing from the bottom vent. Set the needle valve slightly leaner than you want the motor to run in the air, since it will richen up as the airplane becomes airborne. At the end of the run, you will have plenty of indication that it's over because the engine will "burp" several times before stopping completely.

The only other item I use is a fuel filter between the tank and the needle valve, cleaned about every two dozen flights. This is the tank system most top stunt fliers use, and it should solve most engine problems you come up against. ●

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workbench . . *Continued from page 5*

was assembled into a vague reproduction of an airplane or kite, jumping into the air for a couple of feet and then falling in ten different directions at once, scattering themselves and their

"glider" all over the map. Not so at Torrance! First of all, it was obvious that all of these young men had already put in their "fledgling" flights on a gradual slope as mentioned above, but were now truly ready to make sustained flight. Secondly, the gliders they were "hanging" from were substantial (relatively), aerodynamically sound pieces of equipment.

The site was a section of the beach where the land rose steeply about three to four hundred feet back from the water's edge. Looking from the take-off spot, the terrain dropped sharply from an abrupt edge, then became less and less steep as it tapered off to the ocean. The pilots would run about thirty feet to the edge and jump off, using their bodies to control pitch angle. Usually, unless there was a fair amount of wind, they made a shallow dive to build up flying speed and then glided toward the water. About 200 feet or so out, they made a turn to parallel the water's edge and then made a stand-up landing. The total flight ranged from about ten to fifteen seconds, and at times, particularly moments after takeoff, they were 50 to 75 feet in the air.

The majority of enthusiasts use the Rogallo type, flex-wing gliders, which are controlled entirely by body movement. A swing-like seat that hangs below the glider may be swung from side to side for directional control, or, if no seat is used, the pilot suspends himself on his elbows and can swing his body for pitch and direction. One swept-wing biplane, made of small diameter tubing with doped fabric covering, had interplane rudders at the tips, controlled by cables from the pilot. This glider made long, spectacular flights, with sharp banked turns and very moderate sink rate.

If you're interested in knowing more about this sport, there is one small publication "Low and Slow", being put out by Joe Faust, 59 Dudley Ave., Venice, Cal. 90291 at $6.00 a year for 12 issues. A national organization SELF G (Self Launch Flight Group) is in the process of formation, and interest is growing rapidly. Frank Colver, a member of the Harbor Soaring Society, is active in hang gliding and we will present his latest design, in model form, in a future issue . . . . Who, me? Not on your life!!

HANDY HOBBY HINTS

From the Ventura County (Cal.) Comets newsletter, "Comet's Tale", by editor, Ed Hotelling:

"WHICH PROP?

Try different props on your engine and you may find a different pitch prop allows your engine to develop maximum power. Without a wind tunnel, it is impossible to determine what the optimum slip should be or what RPM the engine actually develops while the engine is moving through the air. The trick is to find a prop with a low enough pitch to allow the engine to rev up to the RPM at which it puts out maximum power.

For example, for zero slip, an 8 inch pitch prop turning 21,000 RPM, an 8½ inch pitch prop turning 20,000 RPM, and a 9 inch pitch prop turning 19,000 RPM would all be moving through the air at 162 MPH. If your engine's maximum power was developed at 20,000 RPM, use of an 8½ inch pitch prop would allow you to trim less wood off your prop (to get 20,000 RPM) and therefore develop more pulling force than would use of a higher (9 inch) or lower (8 inch) pitch (assuming constant percentage slip).

Consider that 11-8 prop you always stick on your Veco 61. Have you ever tried an 11-7 or 11-7 3/4? According to the September AMA Competition Newsletter, only five of the first 25 pilots at the R.C. Pattern World Championships used 11-8 props (and they may have been sanded to a lesser pitch). The other 20 out of 25 pilots used a *lower* pitch prop.

Have you ever heard the argument against lower pitch props that they don't go as fast? The argument is valid if the engine stays at constant RPM. However, in practice, the engine RPM increases, so even if each revolution does not carry the prop through the air as far, the greater number of revolutions in a given time takes it through just as much airspace.

For example, for zero slip, an aircraft would fly through the air at about 84 MPH with either an 11-8 turning 11,000

RPM or an 11-7 turning 12,500 RPM. In this case, use of an 11-7 might put the engine nearer its power peak, allow better acceleration from the lower airspeed conditions, and keep the engine running cooler. Also, slip may be less with the 11-7.

Try a lower pitch prop or trim your 11-8's to get your engine turning up near its peak power RPM."

* * *

Another hint from Orange Coast R/C Club newsletter "Hangar Talk".

"A word from the grim reaper about foam wing cutting tools. Electricity is a nasty bird because you can't normally see it, but it sure bites. If you use a variac for cutting foam wings, you have a 50-50 chance of having one side of your bow putting out 110 volts to ground, altho not to the other side of the bow. This is due to one side of the circuit being 110 volts and one side negative. The variac only reduces flow through the unit and depends on how it is plugged into the wall as to which side is 110 volts or negative. To eliminate this risk use a meter ($5.00 at Radio Shack) and check both sides of the bow to ground. If 110 volts shows up, simply reverse the way the plug is in the socket and voltage will be about 20-30 volts. Remember, it is better to be careful one thousand times than dead once!"

OVER THE COUNTER

One of the reasons we got so wound up on the "Guided Free Flight" thing at the beginning of this column was the fact that we were reading over the ad from Ace Radio Control, Inc., Higginsville, Mo., the primary source of pulse rudder equipment, among many other items. Ace is introducing its 1972 line of single channel radios, based on the excellent magnetic actuators developed by the late Dick Adams.

The Ace Commander series, four in all, use the same transmitter, receiver, and wiring layout, the principal difference being the size and strength of the magnetic actuators. The four are: the Baby, Baby Twin, Standard, and Stomper (twin Standard). The airborn system is broken down by connectors into; the receiver, actuator, and battery with switch. With this arrangement, it is very easy and economical to have several airplanes operating off the same transmitter and receiver (Of course, one at a time, Denny Dimwit!!). All that is needed is a separate actuator/battery combo, and these sell for $11.95 to $16.95. The airborn weights, and Ace doesn't get tricky here by saying "without batteries" in tiny print, range from 2.5 to a maximum of 4.8 ounces. That is the *whole* airborn radio system, ready to operate the plane's rudder. The R/C Peanut is not far away! Complete system prices range from $69.95 to $74.95 and they are available on the five 27 band frequencies.

* * *

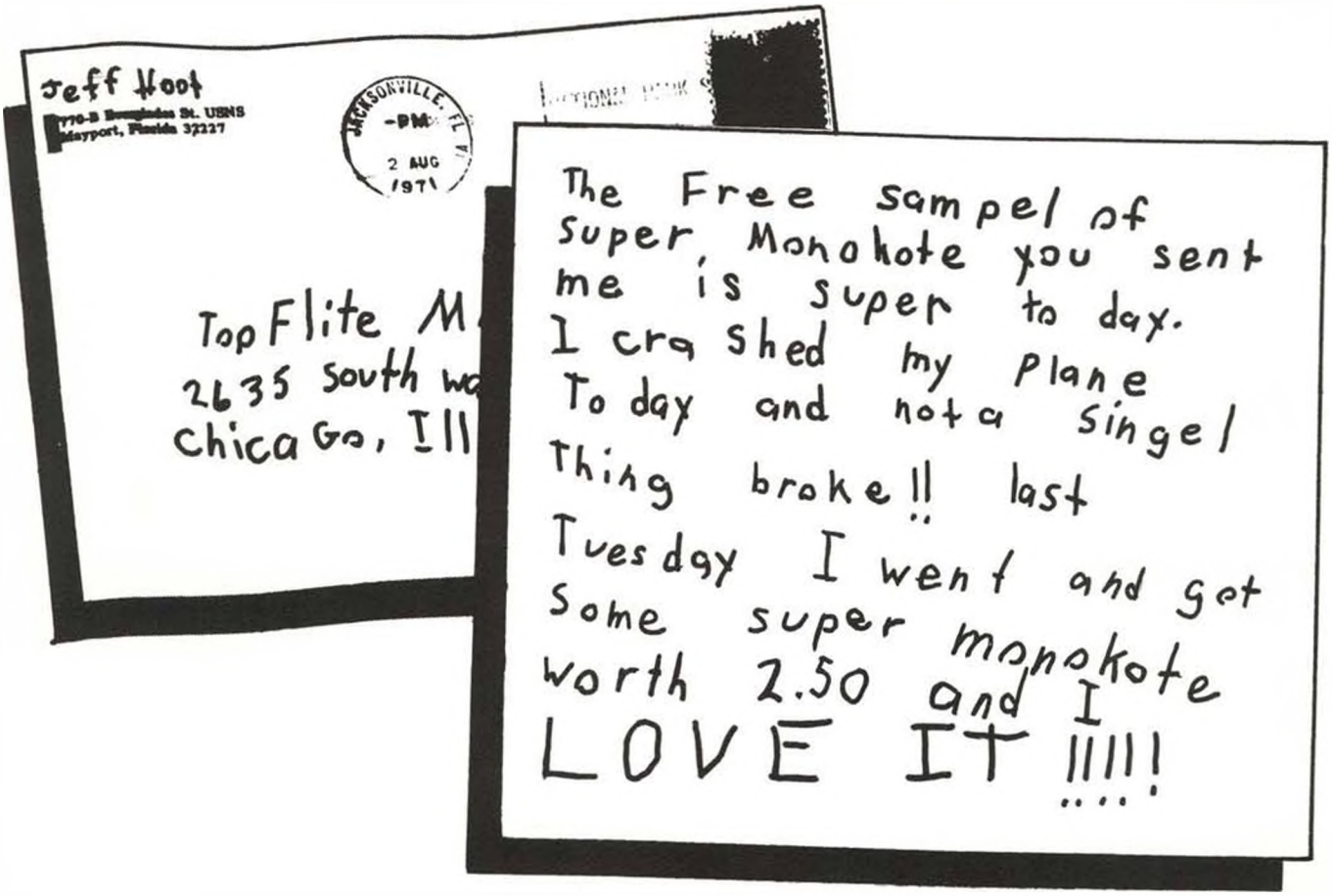
Jack Stafford has taken a departure from his line of scale and racing airplanes to offer a shoulder wing trainer for 45 to 60 engines. "The Weekender", as it is called, has a thick, 800 sq. inch wing which is sheet balsa over foam construction. The kit will include the two wing panels completed, ready for joining and finish. Jack has incorporated a unique and effective thrust offset arrangement, seldom seen in use today. The side mounted engine is set about an inch and a half off center to the left (looking from the cockpit) which creates a right thrust moment without actually "bending" the engine to the right. An appropriate wide-mouth cowling goes around it. Fuselage construction is from 1/4 inch sheet balsa and the tail surfaces are solid 3/8 inch sheet. All up weight is 6 pounds, delivery is scheduled for late January, and the price is to be $39.95.

* * *

Paul Plecan, who should be remembered by many as a model designer and draftsman, has been making up some transmitter slings which hold the control box in the European style that has been made popular by such fliers as Matt, Prettner, and Wester. Paul has developed a sort of universal sling into which the flier straps his transmitter so it won't fall out while being put on or taken off. Unlike the European type which consists of a box into which the transmitter case is slipped, Paul's is much less bulky. Write to him at 2001 South Haster, Anaheim, Ca. 92802 for more details. Price is in the 3 to 4 dollar area.

CLASSIFIED ADS

The store is open for Classified Ads. The rates are 25 cents per word with a minimum of $3.00 worth. Name and address free. That is the non-commercial rate. Commercial rates for dealers, manufacturers, etc. are 40 cents per word, minimum of $5.00 worth. All classifieds are payable in advance, and may be for any consecutive insertion period specified. Because we do not have a long lead time, your ad will appear in not more than a month's time from when we receive it. Incidentally, to commercial advertisers, no mention of mail-order discount houses is permitted. ●



Another Testimonial for SUPER MONOKOTE

Pat. No. 3,388,651

We get a lot of letters from experts about Super Monokote and we've used some of them in our ads. But we thought we'd show you that not all our testimonials come from experts . . . just to prove that you don't have to be a pro to appreciate Monokote.

What's nice about modelers like 10-year-old Jeff is that he's willing to try something new. And, when you consider how long modeling has been around compared to how long Monokote has been around, it's still something new . . . especially to the guys who have been covering their models for years with the same old silk and dope method.

So, if you're one of those guys who hasn't tried something new in a while, do what Jeff did and give Monokote a try. That's all you have to do to realize why Monokote has made the old ways of covering your models obsolete.

MONOKOTE IS AVAILABLE AT ALL LEADING HOBBY SHOPS

Super Monokote (dry adhesive) is available in three metallic, three transparent, one paintable clear and eleven opaque high-gloss colors. Regular Monokote and Trim Sheets (wet adhesive) are available in ten high-gloss colors, PLUS four checkerboard trim patterns.

TOP FLITE

TOP FLITE MODELS, INC.

2635 S. Wabash Ave.
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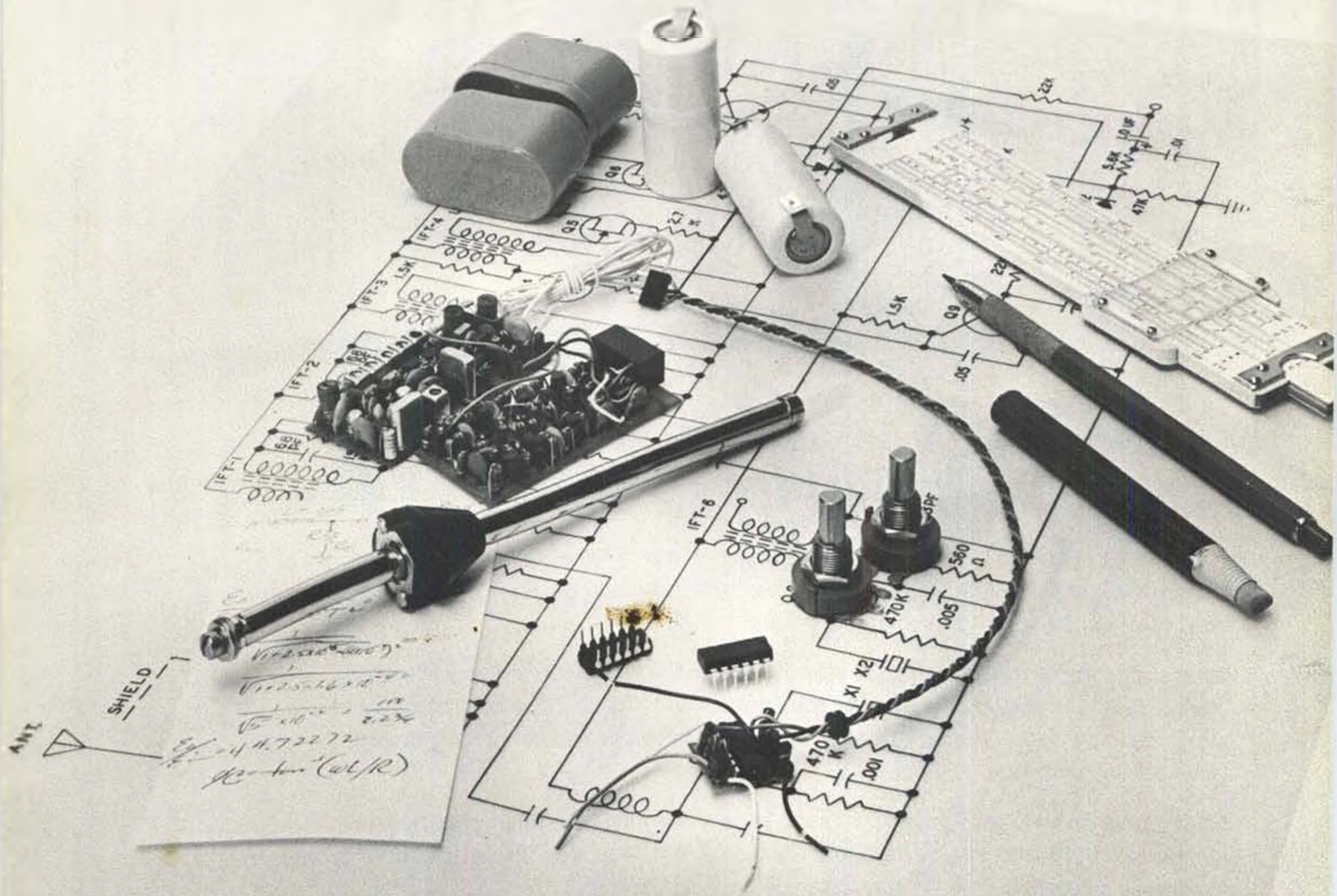
In the works . . .



. . . series seventy-two

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