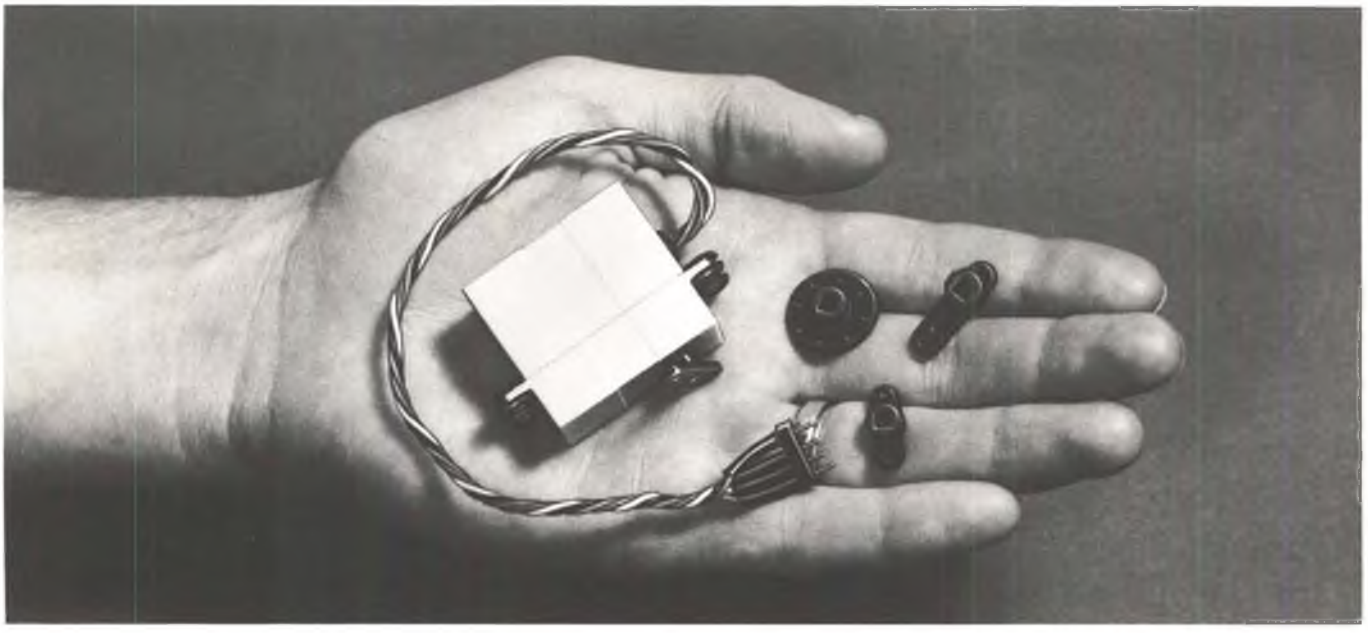
The MODEL BUILDER

DECEMBER
volume 1, number 3

50 cents



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Discounts on special items stocked by AMA Supply & Service Section—books, magazines, pins, decals, etc.

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Super Decal Sheet—three different 4" x 9" sets. AMA wings, FAI emblems.

***The Academy of Model Aeronautics**—a non-profit organization, organized in 1936; guided by regional officers elected from among the membership. National headquarters is in Washington, D.C. AMA members have privileges in other organizations: National Miniature Pylon Racing Association (NMPRA) open only to AMA members. Membership in the Nat'l. Free Flight Society (NFFS) is $1.00 less to AMA members. All AMA members are automatically part of the National Aeronautic Association (NAA) and the Federation Aeronautique Internationale (FAI); may become voting members of NAA—with other special benefits—for half price, and may obtain an FAI sporting license for international competition.

Liability Insurance is included with all AMA memberships. Bought separately, this insurance would cost more than the adult AMA membership fee. Coverage is for $300,000!

Competition Privileges: All AMA members are licensed to enter the National Model Airplane Championships and all other non-restricted meets (over 500 each year—fun-flys, local, state and regional meets, and record trials); to establish national and international records; to compete on U.S. teams in World Championships (two held per year).

Special Help for Youth Members: Membership fee, with full competition privileges, eligibility for AMA scholarships, only $2.00 for either Juniors (up to 15) or Seniors (15 thru 18). (Does not include magazine subscription—cost with magazine subscription only $5.00.)

TO JOIN AMA USE THE FORM BELOW: AMA membership ends each year on December 31, regardless of the date a membership application is received. Late-year membership policy is as follows: those who apply between August 1 and September 30 pay full one year rate, but will receive half-year credit toward the next year's membership—they must, however, use this credit by July 1 of the next year; those who apply between October 1 and December 31 pay full one year rate and receive full membership for the following year, plus whatever days of membership remain in year of application.

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from Bill Northrop's workbench . . .

A MODELER IS A MODELER, IS A MODELER

We read something in a club newsletter that was rather disturbing. The reference to our magazine did not matter so much as did the editor's implications in connection with the comment. In describing the magazine he said, "Sketchy info indicates probable R/C orientation which would most likely make the name a miss-nomer as we all know most R/C people aren't interested in the least in 'Building'."

As we said, the reference to our misrepresenting the magazine didn't bother us (the dirty bracktifrex!) so much as did the uncomplimentary shot at one category of modelers. It is unfortunate that we have people among us who do not respect the interest of others. It is also unfortunate that some of these people have access to methods of public communication, allowing them to spread that disrespect.

First, let's set something straight for the record. The "Builder of the Model" rule was needed and in force long before R/C became an every-day category of the hobby. The rule was primarily instigated to prevent the over-indulgent modeling father from giving his son a heavy advantage over the young competitor who was on his own. This occurred not only in free-flight but particularly in control-line where appearance is a factor in the results.

Our thought, the one we hope to instill in our readers, and the one which is the theme of The MODEL BUILDER, is that we're all modelers. We all use glue, sandpaper, razor blades, pins, straight edges; we all have shavings on the floor, paint in our trousers, knicks on our fingers, sore knuckles from an occasional backfire; and we read articles about all types of models because we're always looking for a better way to do our thing. And being stuck with an image that is always giving us trouble from John Q. Public, who believes everything he reads in the newspapers, we don't hardly need dissension from within the ranks.

The magazine's title isn't a misnomer, Mr. Newsletter Editor, but . . . are you a modeler?

THE 3H CLUB or HANDY HOBBY HINTS

From the Palm Beach Aeronauts Newsletter, edited by Fred Komlosy: You can make your own building clamps cheaply and easily with some 3/16 inch th eaded rod (rom most large hardware stores), wing nuts, washers, and wood strips such as molding stock.

The MODEL BUILDER

December 1971 volume 1, number 3

Cover: Our model builder takes time off from his hobby to get into the spirit of Christmas...and also into his working clothes for Christmas Eve. From the look in his eye, he is obviously planning that all of those gifts will somehow be "left over" when he has finished his rounds, and guess who will get them!!

● INDEX ●

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BOO-BOO DEPARTMENT

Guess neither Mike Tanny nor Dick Tichner read The MODEL BUILDER since they didn't call to give us the devil about the PHOTOGRAVIEWER caption under Mike's PT-13D. Dick Riggs, with Larson Electronics, tells us it was scratch built before the Sterling kit appeared on the market.

Lesson: Never assume anything. Not never no how!

BULLETIN BOARD

Free Flight News is a great package of F/F information, plans, three-views, international competition results, discussions, etc., which no serious F/F competitor should be without.

Subscriptions are $4.00 a year by surface mail, $9.00 by air mail. The address is Ian Kaynes, F/F News, 11 Parkside Road, Sunningdale, Ascot, Berks, England SL5 ONL.

* * *

The St. Paul Model Radio Controllers, Inc. report in their "Pulse" newsletter that they are having regular C.B. interference on 27.145 and 27.195 and have been unable to get the local FCC office to do anything about it. The club is about convinced, according to editor Bob LaBrash, that there is nothing in Part 95 providing a means of registering a complaint and getting results.

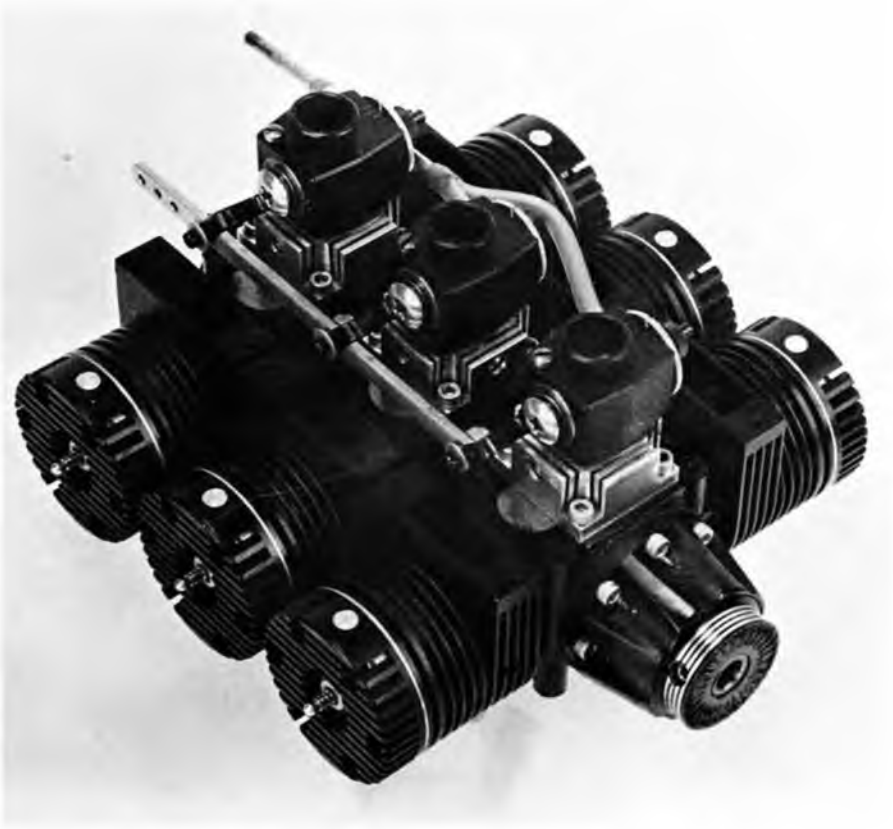
We would suggest that the club go over the local FCC office to get action. When we flew with the Delaware R/C Club back east, we had the same problem from an illegal C.B.'er near the field. Using the monitor, we picked up the culprit's call and tracked him down, found he was using a rotating antenna and booming out about 40 watts.

A call to the FCC office in Philadelphia had two Feds on the guy's neck within a week, and we never heard another peep out of him. At the time, they explained to this writer that it was physically impossible for the FCC to monitor all C.B. activity and locate illegal stations; however, our information was all they needed to take action.

Sounds as though your local office is goofing off. Keep trying, and if necessary, go to Washington.

* * *

In the Twin City Radio Controllers newsletter, Bob Taylor, the editor, tells about the trials and tribulations of putting on their Second Annual Flying Circus for a crowd of over 2,000. One incident caught our attention and it seemed worthwhile handing on to other clubs who may need an idea for a public showing of this sort. We quote Bob:



The Northfield Rosspower 6. Lou Ross has gone berserk! Six cylinder engine rated at 4 hp. Engine weighs 40 ounces, has three carbs, reed valves. Five main bearings. Price is $665.

Another Lou Ross engine, this time the Northfield Rosspower 4. This engine, at 1.2 displacement, can be used in AMA scale events. Reed valve permits running either direction.

There IS a series of free-flight models for the beginner! The "Sprite" is No.5 after some HLG's and R.O.G.'s. Prices are right too. This one $2.49

"Sherwood Heggin staggered out of the spectator area towards the pit area, picked up a ship and a "transmitter" and proceeded out to the flight line, much to the chagrin of the show director who made a less than determined effort to stop him. Sherwood's little boy ran out with a starting battery, and of course, Sherwood managed to get the engine running; the only problem was, the "transmitter" was too far away from him to hold the airplane and pick up the "transmitter" at the same time! He finally made a grab for the transmitter and the airplane roared off!

"Sherwood fumbled the transmitter and dropped it with a consequent shattering of electronic parts all over the ground. Meanwhile, the airplane was performing all sorts of wild gyrations with several low passes over Sherwood's head as he picked up the parts of the "transmitter" and stuffed them back in the case.

"Finally he got it all together and made a beautiful landing! The crowd loved it. Of course, the plane was being flown by a well hidden Jim Magus."

OVER THE COUNTER

Lou Ross, designer of the well known Ross twin .60 (two .30 cylinders) has now joined forces with Northfield Precision Instrument Corp., Long Island, New York, to produce the twin (which appears on our Christmas cover), and in addition, two expanded versions.

Known as the Northfield Rosspower 4 and 6 respectively, the two larger Ross engines, quite obviously 4 and 6 cylinder units, are flat opposed types similar to the twin. With same size cylinders, the displacements naturally come out to 1.2 and 1.8 cubic inches.

The four cylinder engine, which is within the maximum allowed displacement for AMA Scale rules, weighs 26 ounces, develops 2.5 horsepower (!) with a speed range of 2,500 to 15,000 rpm, and is priced at $465.00.

The six cylinder engine develops 4 horsepower, weighs 40 ounces, and costs $665.

Both engines feature coupled Perry carburetors (one per pair of cylinders) and reed valves. Height, less carbs, is only 1½ inches, width 5 inches, and length 4 inches (four cyl.) and 5½ inches (six cyl.). Both have a black anodized finish.

Incidentally, the better known twin is now available in five models. The standard, having exhaust stacks at the rear of each cylinder (straight down stack extensions are available) sells for $125. The black anodized version is $145. The next two models, in black only, feature exhaust stacks pointing up or down and also cost $145. The reed valve model, available with exhaust in standard, up, or down configuration, black only, is available at the same price. Advantage of the reed valve version is the fact that it runs equally well in either direction. Great for twin engine and pusher type aircraft.

* * *

We checked samples of the four products currently available from Southern R/C Products, Citronelle, Alabama. In case you don't happen to know, the names behind SRCP are Don Coleman, well known pattern competition flier (2nd at the Nats), R/C Contest Board Representative, and a member, along with Jim Edwards and Ralph Brooke, of the RCFDA (Radio Control Flying Dentists of America, an outfit with a lot of pull) *and* Lou Penrod, a long time engine specialist who placed 13th in expert pattern in Chicago.

Southern's four products are "Flex-All," "Skyloft," "Sorghum," and "Lifeline."

"Flex-All" is a plasticizer for acrylic lacquer and primer, and for butyrate dope. In acrylic it completely eliminates cracking and spiderwebbing. In dope it reduces shrinking and helps to prevent blushing. A 4 ounce bottle is $1.69.

"Skyloft" is the best new covering material we've seen since the coming of Monokote. However, it is not a plastic

film. The material is a replacement for silk and silkspan. It *looks* very much like silkspan, but is much smoother, less porous, and infinitely tougher. A continuous filament spun bonded nylon, it takes only 3 coats of dope to completely fill, and is just about impossible to tear. In covering, you treat it as you would nylon fabric. It *expands* when moistened and *contracts to its original size* when it dries. A 3 square yard package, with instructions, costs $2.50.

"Sorghum" is a contact cement for applying covering to foam cores. It features light weight, tremendous adhesion, ease of manipulation, and non-critical "open" time, 30 minutes to 3 or 4 hours. A six ounce bottle will do a wing and stab, for $2.50.

"Lifeline" is a black fuel tubing which has lifetime lasting qualities. It actually "grows" to metal tubing, and is extremely hole and split resistant. It's guaranteed against adverse fuel effects. A 4 foot package is $2.00.

Although they'll soon be moving to a new building, SRCP can still be reached at 527 Pecan Street. Zip is 36522.

* * *

Midwest Products, whose EZ-Juan is reviewed this month, is introducing a new series of WW II profile control-liners for .15 to .19 engines. These will be smaller versions of their popular .35 engine series. Price is $7.95.

Kits include die-cut wood, formed wire parts, full color decals, plans and instructions. The first model in the series is the Messerschmidt ME-109. Planes are designed for stunt, slow combat, and sport flying.

* * *

Midwest Model Supply Co., Chicago, Ill. sends along photos of the HP engines mentioned last month.

The 61RR has been redesigned with a completely new disc valve induction system. It's still the big muscle in the group.

The 40FR is actually capable of turning an 11-7 prop as powerfully as some current .60's.

The 40RR stock engine is turning up rpm's equal to some of the custom built racing 40's now being used in pylon racing. However, the availability factor is no longer a detriment. HP is now a legal Formula I and FAI contender.

The 61FR and 40FR are equipped with mufflers as standard equipment. Main differences between 1971 and 1972 engines include cast sleeve, C clips on wrist pin, drop forged rod, modified head and piston, redesigned crankcase, new backplate cover and front housing, *and*, in case you don't recognize *any* of these changes, the cylinder head has been anodized blue!!

* * *

By the way, if your eyes are sharp, you may have noted some minute differences in the Proline transmitter photo on the front cover (We'll now pause while you find out what you missed!). So happens the photo was hot out of the hypo when Jim Fosgate sent it to us for the cover. It's a photo of the 1972 model, and is so new that we don't know one dad-blamed thing about it except what we can see in the photo.

That switch on the top right could be for dual frequency, retract gear, flaps, *or* for instant destruct! Tune in next month for the correct answer!!

* * *

When going over some photos taken by George Bahrman for Mel Schmidt's Free-Flight column, we did a double-take on a picture of a sport rubber job. It turned out to be one of a series of basic kits for beginning builders which include all materials, detailed plans, and instructions.

There is a 10½ inch span hand launch glider for 39 cents, a stick-and-tissue R.O.G. of 12 inch span for 59 cents, a 15 inch span polyhedral winged fuselage job for 89 cents, the 32½ inch span "Sprite" in the photo for $2.49, and a high performance diamond fuselage "Wasp" at $2.99. There is also a 6-pak of 5 inch span assorted gliders at 49 cents.

Of particular interest are the very clear and basic instructions using easy to-understand language. And get this . . . there is *printed* wood in the kits where required. P R I N T E D wood. You dig?

The guy behind all of this is one Len Marlow, and his company is Marlow Engineering, 6850 Vineland Ave., North Hollywood, Cal. 91605. In addition to the kits, Len has a line of machined hardwood wheels including contoured, streamlined, and rubber tired ("O" rings) in 3/4, 7/8, and 1 inch sizes, thrust buttons, washers, prop hooks, formed and machine cut balsa props, and two rubber winders (16 to 1 and 9 to 1 ratios).

So . . . . don't say there aren't any of the good old simple kits around that beginners can build on their own. Here they are . . . and the price is right.

* * *

Back in the late 30's, your editor used to rig up a long fishing pole with just enough line so that when the pole was held vertically at arms length over-

The new HP40RR is now a legal machine for AMA Pylon racing. Stock engine is competitive with the custom built and tuned specials. $59.95

The HP40FR developes .90 horsepower and comes with muffler. Could be used in place of a .60 in some airplanes.

Here we have the hundred and first and hundred and second Supertiger 40RV ABC engine for pylon. That makes them legal in AMA racing.

First of a new series of profiles for .15 to .19 power by Midwest Prod. Designed for stunt, slow combat, and sport flying. Retail is $7.95.

head, a model could be suspended by a wingtip and barely clear the ground. Typical model used was about an 18 to 24 inch span scale rubber job . . . usually a biplane, natch!

With prop removed and weight added for proper balance we would take this rig out in the yard and slowly rotate the pole until the plane, through a combination of centripetal, centrifugal, gravitational, and aerodynamic forces, was flying around in a circle approximately two-times-fishing-pole-length in radius.

Sometimes we revolved with the pole, sometimes, with feet planted, we twirled the pole back overhead, and sometimes, in an emergency, we brought the pole back up to vertical very quickly. On the latter occasions, this brought the airplane roaring in towards the center in sort of a knife-edge loop, just missing the ankles. Many happy moments are recalled flying a snappy little black and orange Wiley Post Trainer in this fashion, shooting touch-and-go's, wing-overs strafing runs, and several of those knife-edge loops. That, we must admit, is the full extent of our own "control-line" flying to this day.

Why this bit of reminiscing and confession? We have just finished reading, from cover to cover, a very interesting new book on the subject "How To Fly U-Control," by Dick Mathis. With his background in circular flying added to his work as a professor of Sociology at S.M.U., he has made the 28 page book interesting even if you don't give a hoot about Ukies. Having actually conducted sociological research on stunt flying and judging funded by the N.D.E.A., his advice on the art of flying ukie stunt and combat has depth that is unique.

A list of the chapters gives you an idea of the content: The World of U-Control, Preflight Checklist, The First Solo, Learning Stunts the Easy Way, Flying the Official AMA Stunt Pattern, and Advanced Techniques for Stunt and Combat. Clear illustrations and humorous cartoons by Tom Peadon add a finishing touch to the text.

The book, in addition to a line of free-flight items (six hand launch gliders, a thermal detector called "Thermal-Ma-Jig," a kit for the 1971 1/2A Nats winning "Mini Pearl," and miscellaneous accessories, is available from M&P Enterprises, 2702-G Industrial Lane, Garland, Texas 75041.

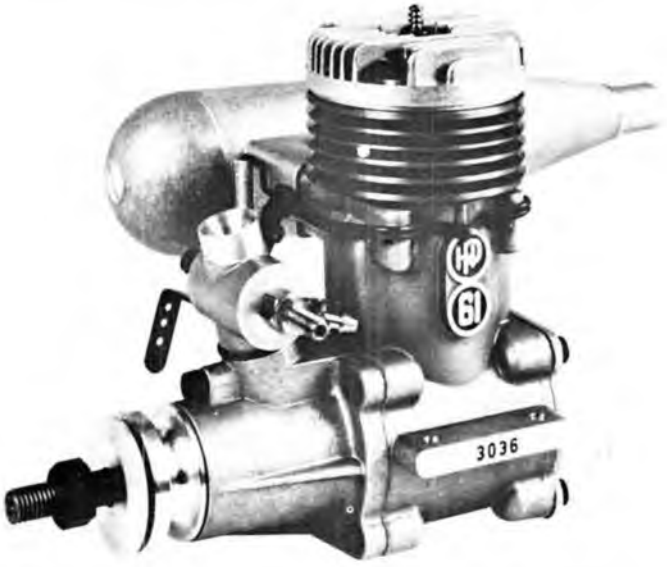
* * *

Well, we've been hearing about Christmas ever since Labor Day, and it looks now as though it, and we, are going to make it. Merry Christmas to all of you, and thanks for having faith in our efforts to get this magazine going. Above all . . . KEEP THE FAITH!!

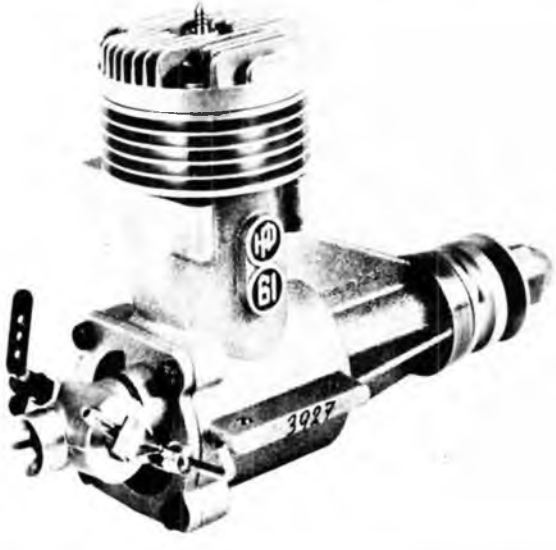
"Saludos Amigos"

Es nuestro deseo llegar a ustedes, un cordial saludo y desearles tengan unas felices "Navidades y un prospero Año Nuevo!

Nuevamente, Gracias por su patronaje.



This is the HP that was second only to Webra in usage at the World Champs. The HP61FR, with muffler sells for 84.95, puts out 1.3 hp.



The new HP61RR is a redo on the first R/C engine from Hirtenberger. Good for heavy scale, with 1.52 hp, it sells for $92.95, marine $102.95

FLY LOW... OR DON'T GO !

Most all of the club newsletters we have seen recently have reprinted the following report written by John Worth, Executive Director of the Academy of Model Aeronautics. If you've seen it but haven't read it, now is the time! Indoor flying is fun, but it's going to get awful crowded , so for a change, let's do something before the fact .....because there ain't no "after"!!!

● AMA leaders met today in New York City with government representatives in response to news stories concerning a reported near collision between a model plane and a jet airliner within the landing approach zone to JFK International Airport on Sunday, October 3. The meeting was requested by AMA members who were disturbed over the nature of the reporting and its potential harm to model aviation activities. In attendance were representatives from the Federal Aviation Administration, the U.S.Naval Air Station, the U.S.Coast Guard, the New York City Police Department, AMA national and local club officers.

Following considerable discussion concerning the report which led to the news stories it was agreed that although model aviation activities have had an excellent safety record to date additional steps should be taken to help prevent a recurrence of such incidents. Specific proposals resulted from the discussion, with reference to model flying in a FAA Terminal Control Area (TCA) near large commercial airfields, as follows:

1. No unorganized model flying activity.
   a. Flying in designated areas only, with positive control provided.
   b. No insurance coverage for activity not under control.
   c. Flying under control of a safety officer.
2. No flying of a nature likely to result in flyaways or free flight; failsafe operation desired.
3. Monitoring of tower frequencies to be provided.
4. Maximum publicity to be used to inform all model flyers of the problem and danger.

It was emphasized in the meeting that the basic safety problem concerned model flying within newly established FAA zones called Terminal Con- Areas. Within each TCA the FAA is responsible for operations of aircraft from the ground level to several thousand feet up. In the New York City area, for example, the TCA for JFK extends for eight miles around the airport. This means that anything lifting off the ground within that area is of FAA concern. Merely limiting model flying operations to several hundred feet of altitude, which is adequate near airports in many areas of the country, is not in itself considered sufficiently safe for operations within the TCA. Such operations can be tolerated only if conducted in a manner and with sufficient control to prevent accidents at all altitudes within the TCA.

It was also brought out that organized type activity such as that conducted by AMA chartered clubs would minimize the problem, if a safety or control officer was provided to be responsible for operations in a manner that could stop or prevent flying in the vicinity of full scale aircraft. The FAA and AMA officials present agreed that a major concern was any lone flyer operating outside of group control.

The need for group activity in TCA situations was stressed by the basic FAA requirements for complete knowledge and control of all flying within the zone of responsibility. Since direct control of model flying was considered to be impossible, in the opinion of the senior FAA official at the meeting, the next best situation would be to know where and how any model flying would be taking place and under whose responsibility.

It was generally agreed that the long range solution to the problem might be the establishment of officially recognized model flying sites within TCA jurisdiction with no model flying except at those sites. The police representative at the meeting

Continued on page 42

Photo by Gus Geissinger

The MODEL BUILDER editor's altitude record ship, FOO-TOO, which held the World Record from 1965 to 1967 at 16,610 feet. Ship was flown to altitudes over 15,000 feet on several occasions, the best being 19,200 on the same day that Maynard Hill flew to 19,500 feet for a new record. ALL of these flights were made under strict FAA control from Dahlgren Naval Weapons Lab in Virginia. During these record trials, the airspace over the field was off limits to full size aircraft. Several times during the flights, full scale aircraft flew through our tracker sights!

Bob Karlsson's CW Junior putts by for the camera. Ship is a slow, realistic flier. Landings, surprisingly are best made with a little power on.

CURTISS·WRIGHT JUNIOR, CW·1

An out-of-the-rut scale model that is easy to fly. As stable and forgiving as it is unique and interesting..... destined to put prop manufacturers out of business. Try it.....you'll like it!! Designed by Ralph Fidance

Close up shot reveals an extra strut added on by Ralph Fidance to beef up the landing gear for rough field landings. Ain't that a little cupcake?

OK, who sneezed? With or without the help of a sneeze the CW dismantles nicely for transporting to and from the field.

Photos by Cubbage Brown

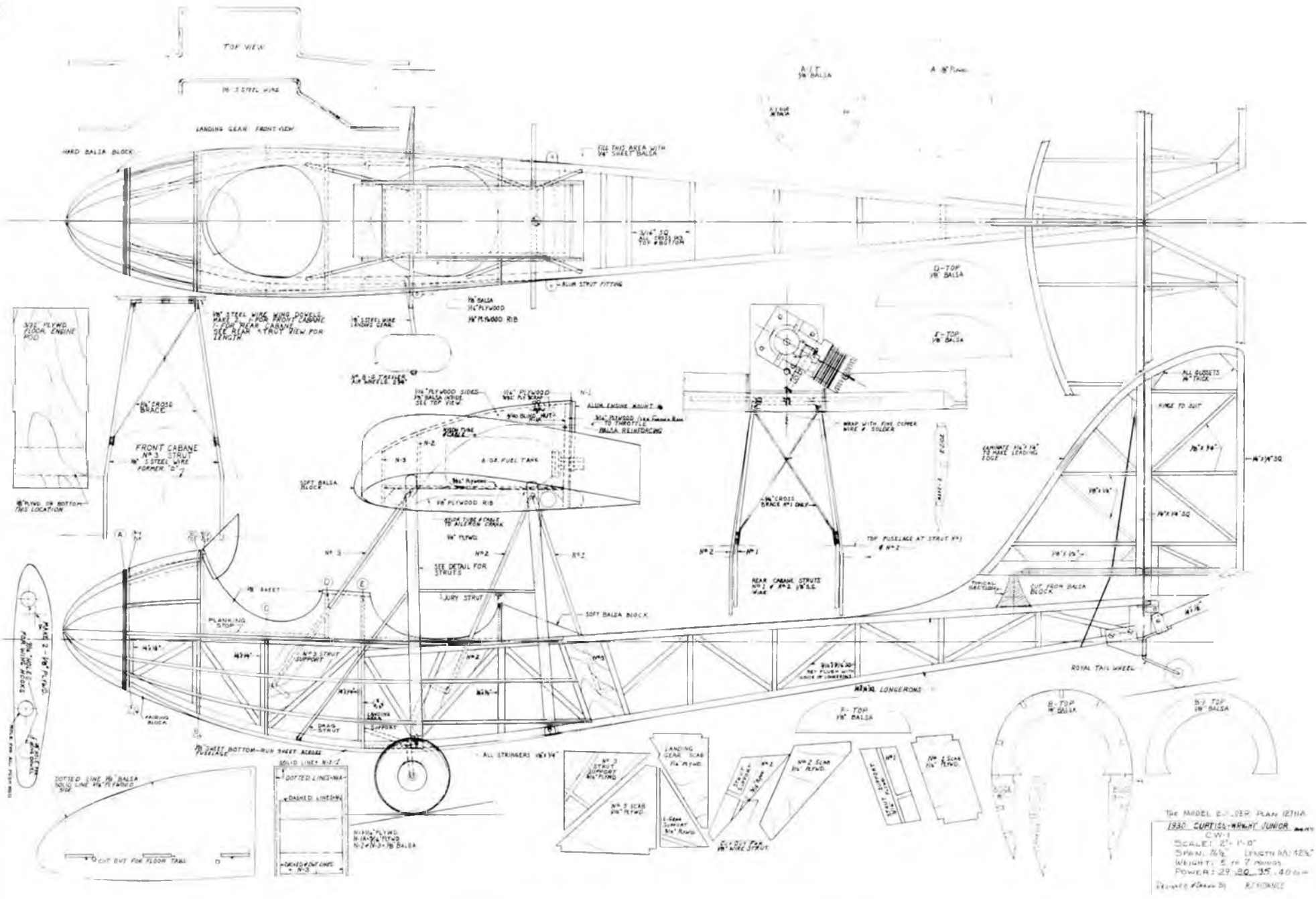
● The Curtiss-Wright Junior is one of those "cute" airplanes that looks as though the designer had modelers in mind when creating it. With a 7½ to 1 aspect ratio wing spanning 39 feet, and a 3 cylinder, 40 H.P. Le Blond or 45 H.P. Szekley engine, the CW-1 falls (or floats) into the powered glider category, along with the early Aeronca C-3 and Longster.

The "rocking horse" fuselage has a turned-up nose that gives the pilot a front porch view. This made the Junior a popular plane for aerial photography and hunting.

During the years 1930 and 1931, 270 CW-1 "Juniors" were built, and the selling price was only $1500. They cruised at 70 mph, maxed at 80, and landed at 32 mph. The gas consumption at cruising speed was 2¾ gallons per hour, or about 25 miles to the gallon.

As a modeling project, the Junior is out-of-the-rut in construction, appearance, and performance. The high thrust line pusher engine and parasol wing combination calls for some fancy wire bending and the use of functional struts. Its appearance at the flying field should be a welcome change from the usual run of

Bob Karlsson, Graham Lomax, and Ralph Fidance have all built and flown Juniors from the plans drawn by Ralph, pictured above



FULL SIZE PLANS AVAILABLE—SEE PAGE 48

Tail surface control linkages from Nyrod tubes are conventional. The curved outlines are easily formed by laminating strips of balsa.

The "office" with Micro-Avionics servos. Outboard servos move cables leading to throttle and aileron controls in engine nacelle. Simple rig.

View of underside of centersection, with wing panels ready for hook-up. Note left-hand prop which was hand carved. Not really difficult.

Right wing is now attached, aileron clevis hooked to crank. Wing held on by rubber bands to cup hooks. Power is Enya .35.

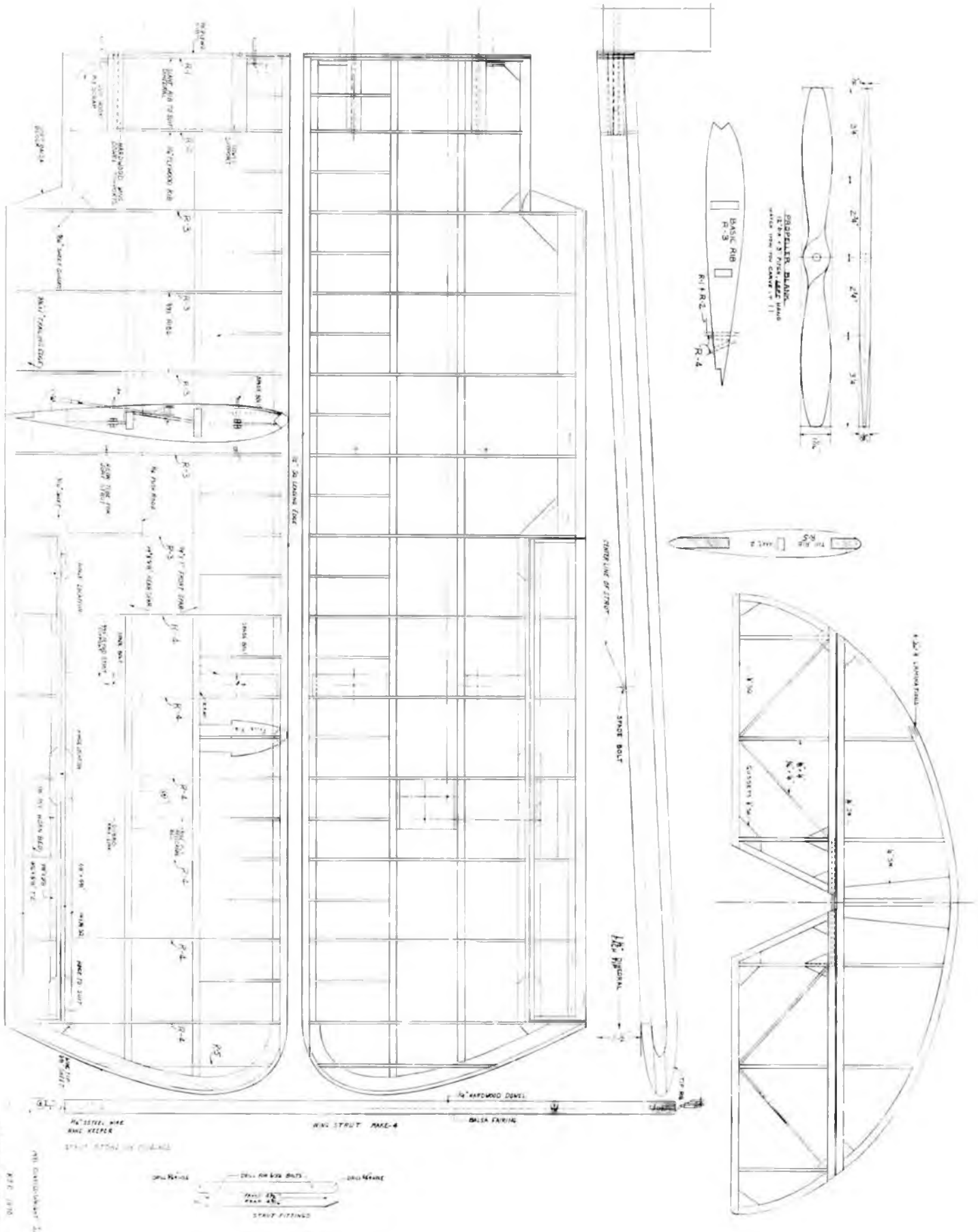
nameless toads. As for flight characteristics, there should be no doubt about its ability to putt around realistically. Just one thing to watch. It can use a little power on landings. If you come in deadstick, keep up flying speed with a steep approach until you're ready for the touch-down flare.

Construction

Everyone has their favorite method of building a model. Some start with the fuselage, which is usually considered the most difficult, and then keep building and adding parts until the plane is complete. Others prefer to get the tedious part out of the way first; the wings, then the fuselage, and finally, the tail (which seems logical since it usually comes last).

Our own preference is to start with the fin, rudder, stab, and elevator. This sort of eases you into the project, as material and tool requirements are rather uncomplicated, the structure usually doesn't take too long to get together, and when you finish them, you sort of have the feeling that you're well along with the project. Nowadays they call this psyching yourself for the job.

The tail surfaces of the C.W. Junior are basically a ¼ inch thick framework. The curved portions of the surface outlines are made up by laminating four 1/16 x 1/4 inch strips. After making the four-layer sandwiches of balsa and glue, curve them to the outline and pin



FULL SIZE PLANS AVAILABLE—SEE PAGE 48

Functional wing struts are hooked on using Rand keepers. "Z" bend in 1/16 inch wire provides adjustment for length. Note receiver antenna.

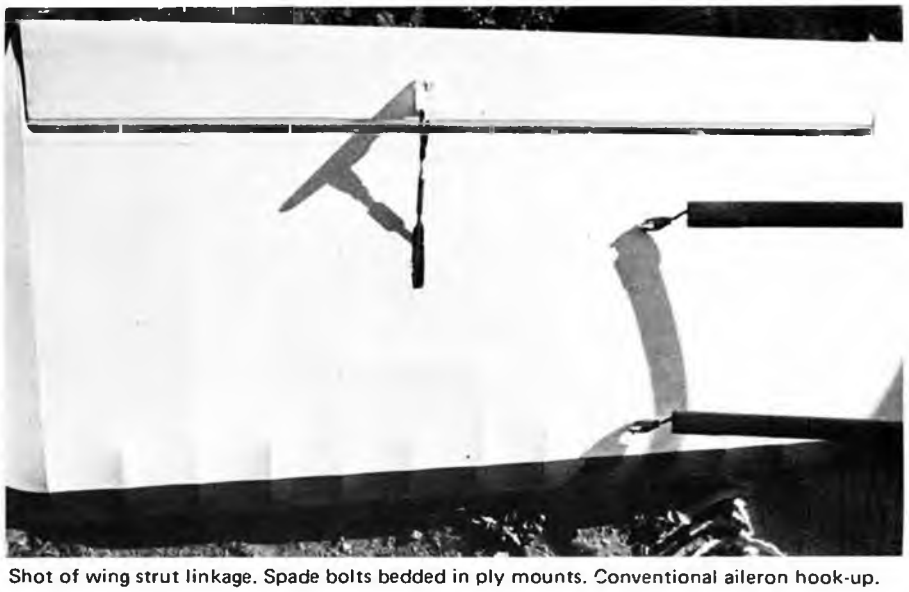
Here's a good view of left-hand prop. You can get left-hand cranks for some engines, but carving a prop isn't bad. It'll last for ever.

in place. Allow these to dry and take a set before trimming off the excess and completing the framework.

Fuselage construction is of the traditional framework type, with 1/4 inch square longerons trussed with 1/4 square and 3/16 square verticals, diagonals, and cross pieces. Note that all of the 3/16 inch square truss members aft of the side stringers are installed flush to the *inside* of the longerons. This provides a raised frame, which will ensure a smooth, bump-free covering job.

Forward of station E, the framework curves inward rather severely and may require some special treatment. We would suggest a series of vertical saw cuts part way through all members, on the inside, about a half inch apart, starting at E and working forward to station A. Just before pulling the sides together with crosspieces inserted, force Titebond or epoxy glue into all of the saw cuts to recover the strength.

The tail surfaces are mounted on a carved fairing block. Best bet is to band or jig-saw the block to the profile, draw a centerline along the top, hold the fin in place and trace around it. Now glue the block in place and start carving. A



Shot of wing strut linkage. Spade bolts bedded in ply mounts. Conventional aileron hook-up.

No. 26 X-acto blade (of course in a handle, Dum Dum!) is real handy for this. For final shaping, the fairing should be convexed somewhat, as shown on the drawing.

The center section and cabane struts are sort of the keystone to the whole airplane, and though they look complicated, they can be assembled without too much trouble. We won't go into the whole science of accurate wire bending, but since the wire cabane struts determine the final alignment of surfaces, some suggestions will be made.

First of all, and let's take strut No. 3 for an example, don't start at one end and work your way around. Rather, determine the total length of wire required for the strut, divide the figure in

Continued on page 46

FREE FLIGHT

Photos by George Bahrman

This month, Mel Schmidt, Dist. X F/F Contest Board member, takes over as Master of Ceremonies. He will maintain our policy of emphasis on the how-to in modeling....

Here's our Free-Flight M.C. extracting a broken motor from his Coupe D'Hiver. Plans on next page...a good airplane to use for breaking in to rubber F/F competition. Note undercamber.

● Most modelers enjoy a great magazine and from all indications this magazine is going to be just that. When Bill and Anita Northrop spent Sunday with us flying Wakefield, Nordic and Power Free Flight, it was clear that they had much more than a casual interest. It's this interest and a lot of hard work that will make the "Model Builder" a great magazine. *(Aw shucks, Mel!)*

We agreed to do this column, not because we had any special abilities, but because we believe that model building and free-flight are worth talking about. In this column, the emphasis will be placed on free-flight techniques, designs and ideals. Photos, articles and illustrations will be used from many modelers across the country.

S.B.L. COUPE D'HIVER

At the 1971 Nationals, the Coupe shown in the three-view took second place in the Open age group and second and fifth places in the Junior-Senior age groups. It, or its variants, hold both the Junior and Senior National Coupe records. Other honors include first place at the 1970 West Coast FF Championships.

Bob Isaacson is adding a trim tab to his 900 Star Duster. Note stranded wire stop for DT position on stab. Taibi's design is popular kit.

Tom Hutchinson's ship. 1/2A modified 350 Duster, can almost be heard as it portrays "Up, up, and away!" Scene is popular Lake Elsinore.

The business end of Bob Isaacson's Star Duster, powered by a K & B 40.

Tom Hutchinson about to release his 1/2A for a test flight. Smile, Tom!

The layout was influenced by George Batiuk Sr., Denver, Colo. with airfoils by John Lenderman, St. Helens, Oregon. S.B.L. is a combination of the last initials of the three designers.

For anyone having an interest in the Coupe event, the ship is worth study and even duplication. It's also ideal for a first rubber ship because of the ease in building and flying. All lines are simple and straight forward. The prop requires no carving, being shaped by sanding 1/8 sheet balsa.

Propellor hub designs can be rather exotic, as one of this month's photos illustrates. Sig Mfg. Co. carries a line of ready carved props complete with clear dope finish. These props have also been cut apart and hinges installed. They come in 12, 16, 20, and 24 inch diameters and are priced from $3.00 to $5.50. The 16 inch prop could be cut down to the 14 inch diameter required for the S.B.L. Power trimming is done using side thrust and rudder tab.

All three ships flown at Chicago used a right-right pattern. The motor can be six strands of 1/4 inch Pirelli or eight strands of 5/32. Average non-thermal flight times are about 100 seconds. Motor runs varied from 18 to 24 seconds depending on the motor selection.

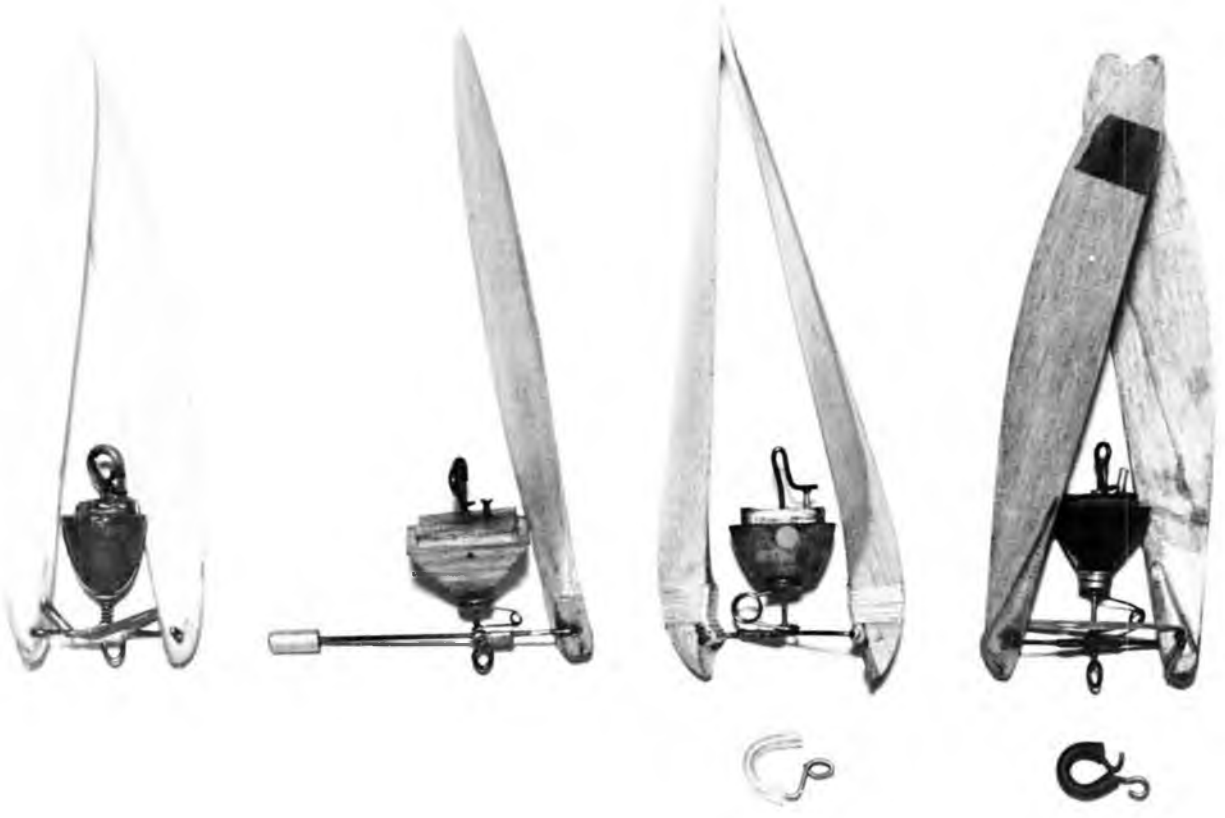
TATONE TIMERS

Word has it from John Tatone that his famous timers will again be available in quantity. A shipment is expected from Japan after the first of the year. John still manages to keep up his repair service at two dollars a copy.

BALLOON PRESSURE TANKS

We have been making some tests recently to evaluate the use of balloon tanks. The results were as follows:

a. A Cox .15 MK 2 Special showed an improvement in RPM of from 15.7 to



A brace of Coupe props, by the experts (l to r): Bob White - "Pool Que", Lee Polansky - "Yellow Bacon", Tom Hutchinson - "Hutch's Hang", and George Bahrman - "Cute Coupe" (by Dave Linstrum). Note interesting variety of hub designs. We'll detail some of these in the future.

17.7 thousand when using a 8 x 4 prop and 50 percent nitro fuel.

b. A Cox TD .049 went from 19.0 to 20.9 thousand when using a 6 x 3 Cox prop and 50 percent nitro fuel.

c. An OS Max .35 increased RPM from 13.2 to 14.4 thousand on a 10 x 5 prop and 30 percent nitro fuel.

Although these tests were a bit crude they do suggest an improvement of 10 to 14 percent RPM increase as the result of using a balloon pressure tank. The advantage of balloon tanks are well known to the speed flyers but to many free-flighters it's something new. We recommend practicing on a test bench, because it takes a bit of getting use to.

NEW RULES FOR GAS FREE FLIGHT

As of January 1, 1972, new AMA rules will be in effect for Gas Free-Flight.

The first three flights will be flown as before, but the flyoffs will be settled using reduced motor runs. For Category 1 (5 minute maxes), 10 and 8 second motor runs will be allowed for the first flyoff and second and subsequent flyoff flights. For Category 2 (3 minute), 7 and 5 second motor runs will be allowed for the first flyoff and second and subsequent flyoff flights. All flyoff flights must be hand launched. No other changes have been made to the power rules.

Why was this rule change made? No one can question the principle that Cat. 2 models should be flown to no more than a 3 minute max. After all, if the field was large enough for 4 and 5 minute flights, the contest should be flown as Category 1. The only question is whether Cat. 1 flyoffs should be run the same way. After consideration, the Free

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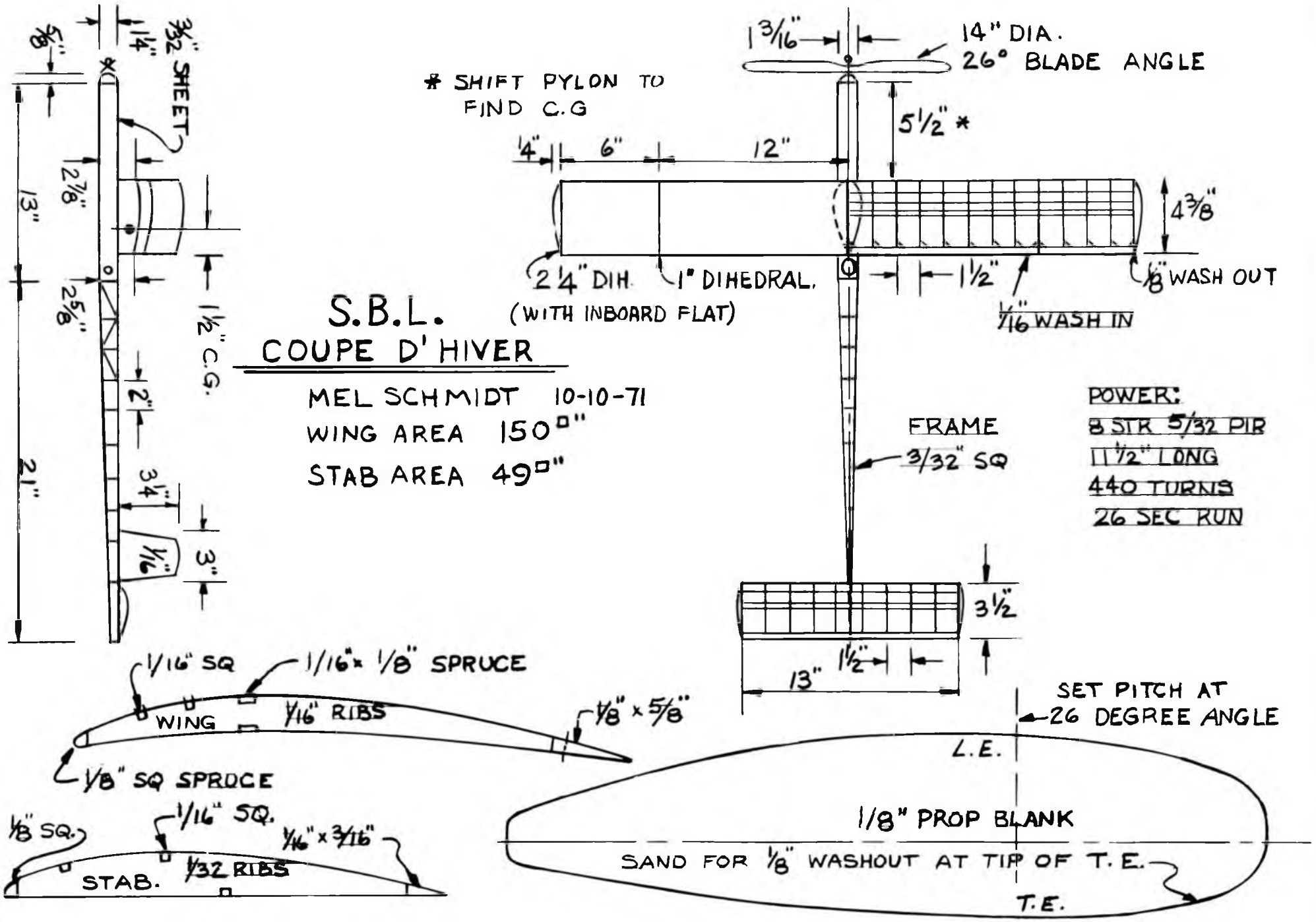
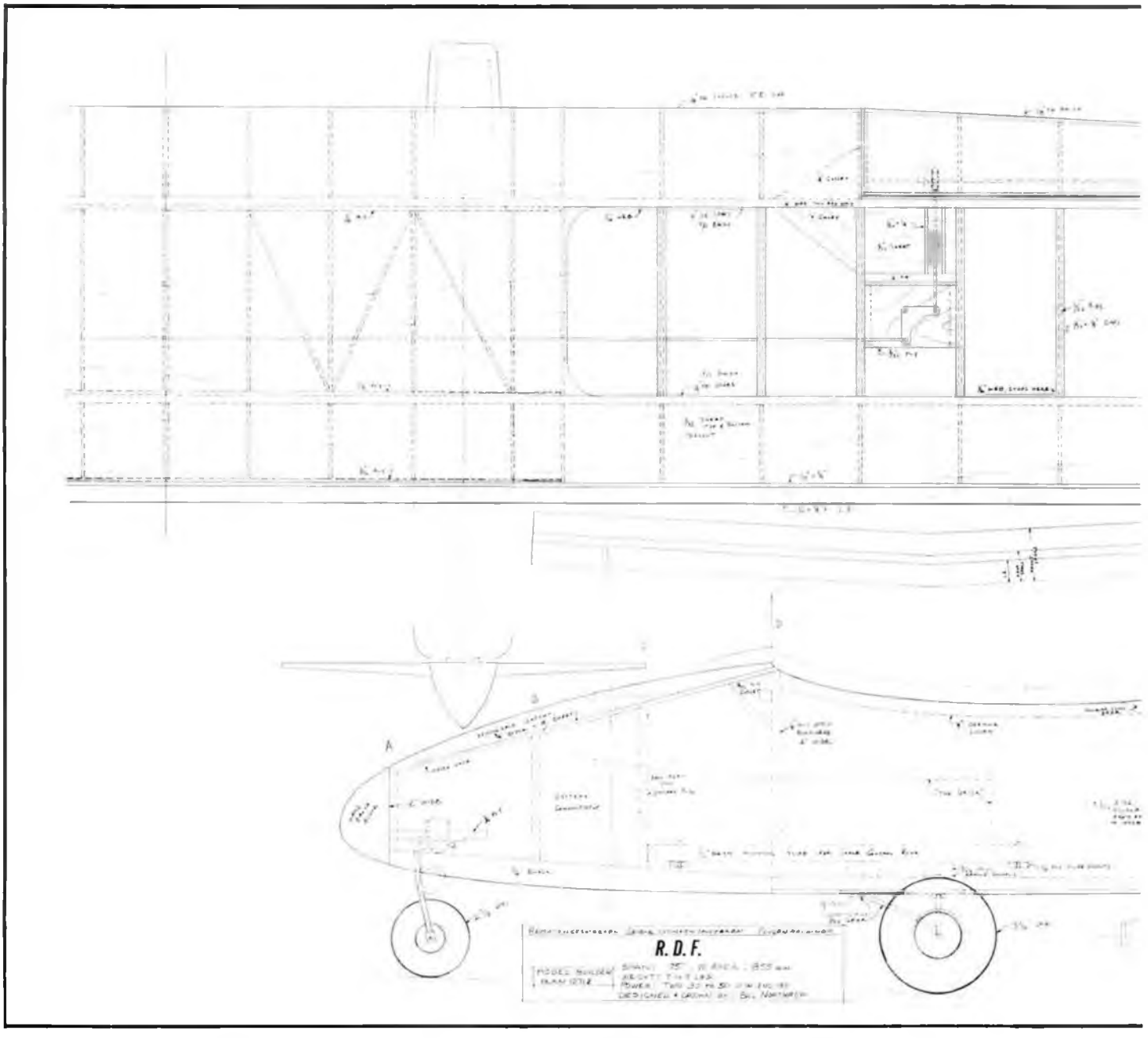
Bill Howard testing his new geodetic Galaxy in the wide open spaces of Lake Elsinore.


S.B.L.
COUPE D' HIVER
MEL SCHMIDT 10-10-71
WING AREA 150 □"
STAB AREA 49 □"
* SHIFT PYLON TO FIND C.G
14" DIA.
26° BLADE ANGLE
5½" *
2¼" DIH.
1" DIHEDRAL.
(WITH INBOARD FLAT)
1½" C.G.
1/16" WASH IN
1/8" WASH OUT
FRAME
3/32" SQ
POWER:
8 STR 5/32 PIB
11½" LONG
440 TURNS
26 SEC RUN
SET PITCH AT
26 DEGREE ANGLE
L.E.
T.E.
1/8" PROP BLANK
SAND FOR 1/8" WASHOUT AT TIP OF T. E.
WING
1/16" RIBS
1/16" SQ
1/16" x 1/8" SPRUCE
1/8" SQ SPRUCE
1/8" x 5/8"
STAB.
1/32 RIBS
1/8 SQ.
1/16" SQ.
1/16" x 3/16"
3/32" SHEET



This plane was originally called the REMOTENGESHTEEREN DOUBLESTINKENSPUTTEREN FLUGENMACHINER. but most people referred to it as "that sweet sounding twin".....which is a little more dignified and a lot easier to say. Another in our "Short Article" plans.....

TWIN TRAINER

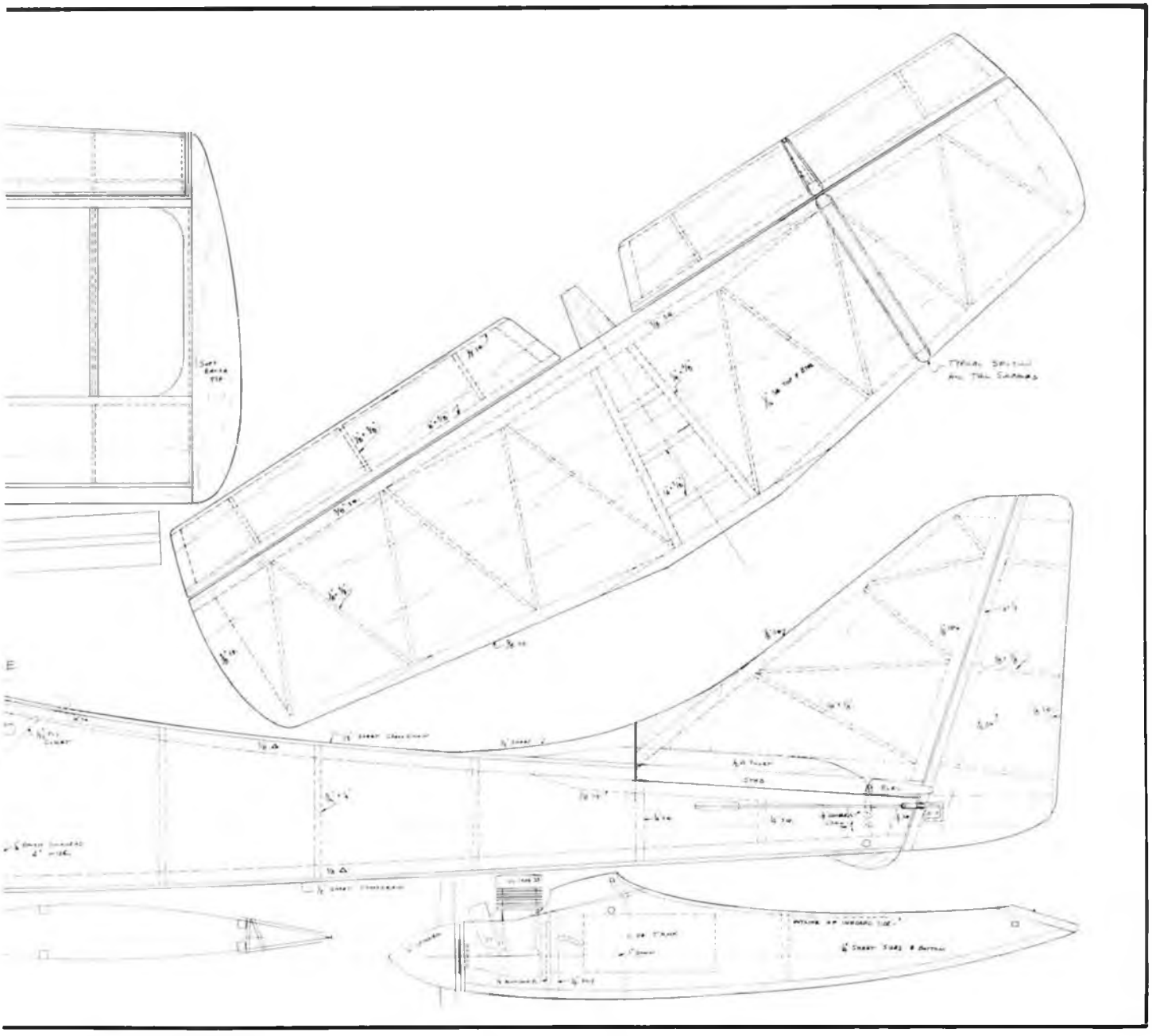
By Bill Northrop

● This plane was developed several years ago for fellow Delaware R/C Club member Carl Cantera, who wanted to try a mild-mannered twin engine plane as a test bed for more progressive multi-engine designs. As a matter of fact, the drawings show the installation layout for a Space Control "Brick", which may not even cause a batted eye by many R/Cers today.

In spite of the fact that the original airplane, built without modification from these plans, flew for two or three years in the hands of at least four owners, we've been unable to locate a single photograph. We have movies, but no stills.

The plane was not only multi-engined and multi-controlled, it was also multi-constructed. We designed it and drew the plans; Jack Alderson framed it up; Tony Wilford covered, finished, and installed the radio, and Carl Cantera, as owner, furnished all materials and the radio. By the way, in case you don't remember or weren't involved in R/C in the early 60's, the tab on Space Control was $750 or thereabouts.

The first flight, with so many people involved in the project, was full of sus-



FULL SIZE PLANS AVAILABLE—SEE PAGE 48

pense until moments after the takeoff. With the goose-pimply sound of two engines running in perfect sync, the ship took a moderate roll, the nose-wheel came off, followed by smooth rotation, and the climb-out was beautiful. Carl, who was on the stick, made two passes up and down the field and simply said "It's a piece of cake. We don't have to touch a thing!" It was as simple as that.

There are only two good reasons for building a twin. One, naturally, is if you're making a scale model, but the best reason in the world is simply to listen to the two engines. Synchronizing them doesn't require a tach. You simply get one running the way you want it, then start up the other and tune it to the first. Unless you're stone deaf, you can tell by the sound when they're in sync. As you get near, there is a "beat" that can be heard above the exhaust noise. As you continue adjusting the needle, the beat gets slower and slower in rate and suddenly, when you're right on, you get that goose-pimply sound. That, folks, is what twins are all about!

The R.D.F. was designed for that big second reason. Construction is extremely simple. The sheet fuselage sides are joined by the two main bulkheads and are then pulled together at the tail post and joined with a two-inch wide bulkhead at the nose. After that you plank the top and bottom with sheet wood, grain going crosswise.

Tail surfaces are simple frames covered with 1/16 inch sheet. Elevator area *could* be enlarged in chord by half again if you're looking for more drastic maneuverability, but it's smooth as glass with the amount shown. Original tail surfaces were rubber-banded on, but you can permanently affix them if you so desire (that's a fancy way of saying "Glue 'em on if you want!").

Wing construction is no mystery and could be made simpler by eliminating the tip trailing edge taper. This was a carry-over from an aileronless (?) wing design which had built-in washout . . . not necessary here. Use spruce or hard balsa for the spars.

We would suggest that the simple box-constructed engine pods be installed

Continued on page 48

pylon

Continuing the how-to-do-it policy of the magazine, top NMPRA flier Bob Upton gets into the nitty-gritty of setting up a pylon racing engine for the most reliability.....More info on the Quarter-Midget movement comes from Bob Penko of the Mentor, Ohio group.

● I'm sure there are more than a few R/C modelers in this hobby of ours who would like to get into competitive racing. This discussion is an attempt to help those new to the racing game.

Whether it be for Formula I or FAI, start with an established racer that is known to be a good, consistent flying model. You need only to attend the next race to determine which model flies well and is leading the pack.

The key element in framing a racing model is strength and lightness. Bear in mind the tremendous horsepower today's racing engines develop and the attendant vibration your airframe and radio is going to be subjected to. The areas that demand particular attention are the following: In the engine compartment, make sure the firewall is at least 1/4 inch thick, of a good grade of plywood (5 ply), and is *very* securely cemented and epoxied in place. Back-up gussets are a good idea here. When attaching the engine mount to the firewall, use 6/32 screws with lock washers (40 size engine) and put them in *tightly*. You would be surprised how easily an engine mount can come loose when your engine is turning between 15,000 and 18,000 rpm.

Tom Clark's 1/4 Midget version of deBolt's Cobra. Kraft on Mode II. Mentor, Ohio.

The balsa wood sheeting should be at least 3/32 inch thick on foam wing cores, and a good grade of adhesive used to attach the skins to the wing. A word of caution; don't sand the wing skins down too thin as this material is the ultimate strength of the wing. Use glass cloth or celastic *generously* in the center section. The greatest stress is in this area. The next time you attend a Formula I contest, notice how the wings flex as the models negotiate a tight pylon turn. This observation will make a believer out of you as to the necessity for a rugged model framework.

Fairly sharp leading and trailing edges on the flying surfaces are essential for good penetration and speed.

The stabilizer should be of fairly hard stock and should be at least 1/4 inch thick, Again, don't sand the stab too thin as you could run into a flutter problem, resulting in a bent bird.

Proper hinging of the flying surfaces is very important. I personally epoxy toothpicks through every hinge anchor and have yet to experience a hinge breaking loose. If you have a fairly long moving surface, such as an aileron on a Minnow for example, use three hinges per aileron. The more rigidly the control surfaces are mounted to their respec-

tive components, the less likely a flutter problem will develop.

Speaking of control surfaces on most Formula I or FAI models, very little travel is required to obtain a very positive and quick reaction. The aileron travel should not exceed 3/8 of an inch in total up-and-down deflection. In most cases, 1/4 inch is sufficient. The elevators need not travel more than five degrees up or down. Of course, the sensitivity of the controls is up to the individual flyer. However, please keep in mind, an over-sensitive model will be a "ball of snakes" during "up tight" competitive flying, particularly if the flyer is new to racing. Chasing around in the sky solo with a racer is one thing, and flying in a race against your peers is quite another thing, indeed!

While on the subject of flying, competitive racing is *not* a sport for the novice R/C flyer. I'm afraid there is a misconception in some circles that pylon flying is easy. After all, "you just go around in circles!" Nothing could be farther from the truth; learning to fly a good course around the pylons is an art acquired only through constant practice and participation in the various racing events.

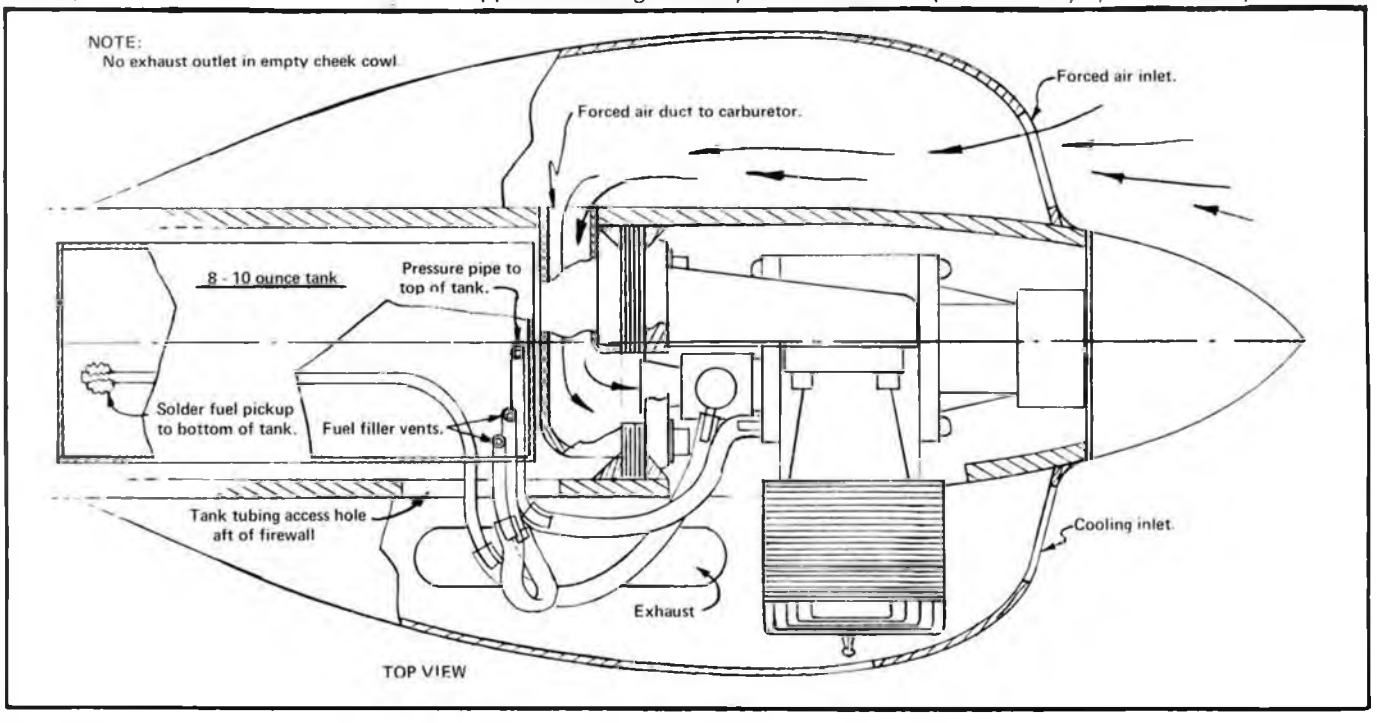
Most racing models require a lot of room to land and are a bit trickier in general to handle. Since, out of necessity, the model must be flown fairly close to the ground, there is not much margin for error, particularly at the speeds the models fly. While I don't wish to discourage newcomers to the racing game, I do recommend considerable stick time prior to attempting to compete against the "fast guys."

Since the name of the game is essentially engine plus consistency, we will dwell on these subjects. Your choice of engine should be dictated by the competition. Look around and pick an engine you think you can live with. I, personally, leave the engine work to the experts and won't attempt to go into engine rework in this text. However, the engine set up is extremely important and merits considerable attention. The carburetion should have a forced-air system connected thereto when a pressure system is used. In rear rotor engine installations, a hole larger than the carburetor barrel intake is drilled through the motor mount and the firewall, in line with the barrel, and a channel leading from the hole to the empty cheek cowl (cowl opposite the engine cowl) is constructed on the back side of the firewall. An air intake opening is provided in the front of the cheek cowl leading to the air chamber behind the firewall. *No* exhaust hole is provided in the empty cheek cowl, so that air is forced into the carburetor barrel through the channel communicating with the inside of the cowl, thence into the carburetor.

Next, the removable cowl surrounding the engine should have a cooling slot in the front, approximately 1/4 inch wide and 5/8 to 3/4 of an inch long, and an exhaust outlet to the rear of the engine at least *twice* the size of the front opening. A baffle should be placed behind the engine to direct the air out of the cowl through the exhaust opening. A short stack extension, commercially available, is used to direct the engine exhaust out of the cheek cowl.

The fuel tank should be a minimum of eight ounces, since today's racing engines consume increasing amounts of fuel as the horsepower curve goes up. I use a ten-ounce metal tank. The fuel pickup should be fixed inside the tank towards the rear bottom of the tank. The fixed pickup allows the flyer to invert his model to shut off the engine in the event the engine shut-off fails. If a plastic tank is used, it should be reinforced on the outside to resist the pressure from the engine pressure pickup. The pressure line within the tank should be at the top front of the tank.

When a two-line (fuel pickup and pressure line) system is used, it is neces-



Kurt Rose cranking up his Mustang at July 4 races in Mentor. What in heck is that tube going from the tank to Kurt's mouth? Taste good?

Fred Steffen's sharp looking Bonzo strains at the leash for Formula II race at Mentor, Ohio. Grass field takeoffs are rough (Pun not intended).

sary to break both the fuel line and the pressure line to the engine in order to fill the tank. I use two additional vent tubes leading to the top front of my metal tank for fueling purposes. After filling the tank, I merely bridge the two vents with a length of fuel line. This procedure leaves the fuel line and pressure line permanently connected to the engine and I often safety wire these lines to their respective nipples as an added precaution. A small hole in a fuel or pressure line will result in an extremely erratic engine run and for this reason, it is best not to disturb these vital connections. Vibration problems rob your engine of rpm and seriously hamper the operation of your radio. Therefore, it is extremely important to balance your *props* and *spinners* prior to use.

Next and final point to make is consistency. Strive for consistency! Preventive maintenance will go a long way towards your goal of consistency. When on the starting line, your engine should start without trouble every time. After a race, the first thing that should be done is refuel the model. Make a visual check at this time of the fuel lines, prop, and engine compartment, making sure everything is in order. Next, remove the plug from the engine and replace as necessary. Most flyers use a no-idle bar plug for best results. Finally, check the wheel alignment. Often times a moderately rough landing will "spread eagle" your gear which can easily cause an embarrassing nose-over your next time at the starting line.

As to flying the pylon circuit, only experience and a good caller will bring in a winner. However, a well constructed model with a proven engine installation will go a long way towards helping you reach your goal of becoming a winner, as well as providing a sound platform for building confidence in the flyer. The next time you are at a racing event, don't be afraid to ask questions; most modelers, if they are not particularly pressed, will be glad to help you. See you at the next race!

ONE FOURTH PYLON

Bob Penko is the man in charge at Kirtland Hardware & Hobby shop, Kirtland, Ohio. He has also been, for the past few years, the one individual whose name comes up the most whenever Quarter Midget pylon racing becomes the topic of conversation. The Mentor, Ohio group has been doing a lot of QM racing and has come up with quite a few comments, suggestions, and recommendations which Bob has compiled and sent along to us. We'll throw them to you at random.

Don't forget the economics of the smaller plane. You can fly all day on a quart of fuel. Plane and engine total 30 to 40 dollars, even less.

Bob couples rudder to aileron using a piece of monofilament fishing line and spring loading the rudder to a stop peg. A little right rudder is handy during takeoff. *Continued on page 47*

Bror Faber, newly elected NMPRA Pres. for 1972, and the Nupen-Faber team planes at Bakersfield: Stafford Mustang and scratch Loving's Love.

John Garabidian patrols the line of planes being handicap judged before racing at Bakersfield. No-restriction engine rules could kill this turnout!

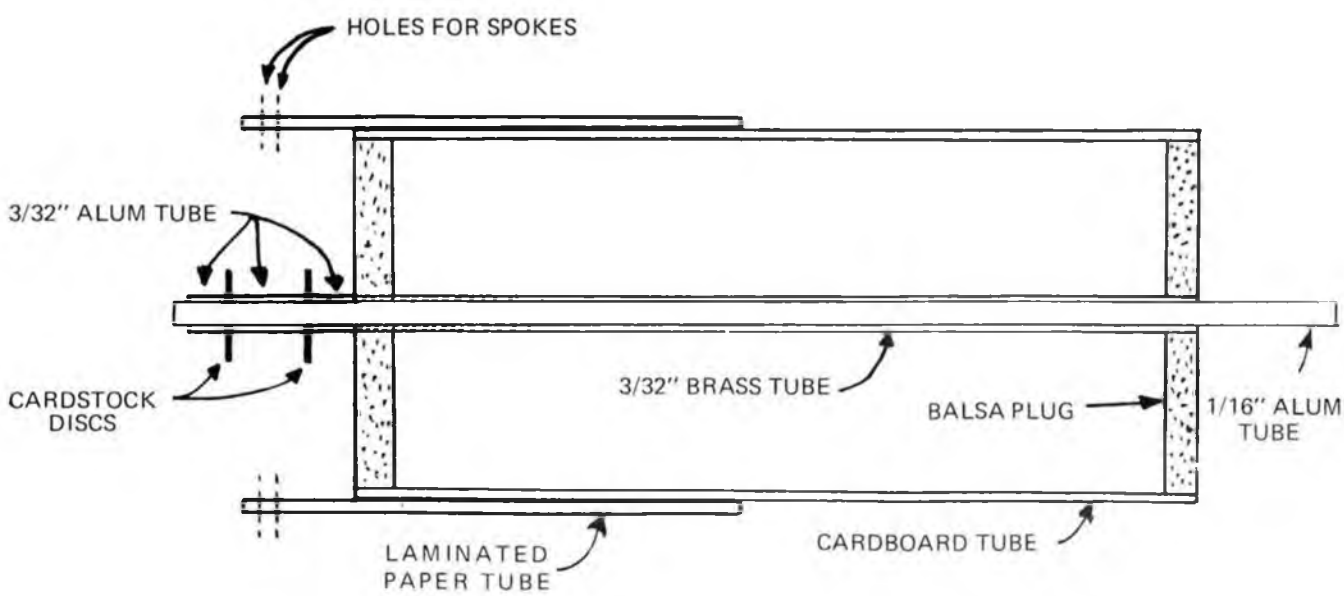
the Model Builder's Classroom

Courtesy of the North American Flightmasters' Newsletter, we bring you a sneaky way to make "wire" wheels, by Don Typond. Newsletter is published monthly by Fernando Ramos..

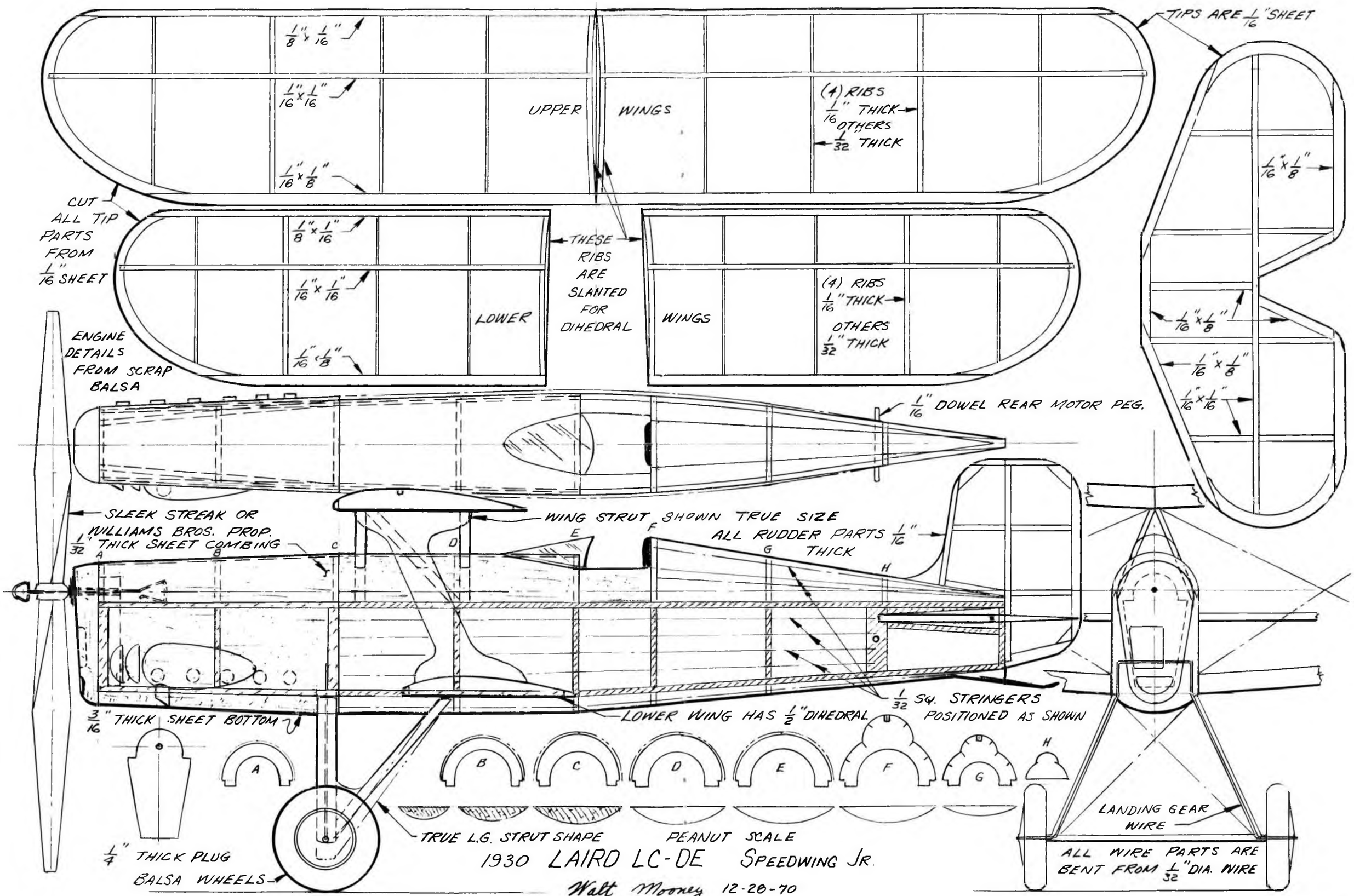
● Anyone who has built a model of a 1910-era airplane (aeroplane) has run headlong into the problem of how to duplicate the spoked wheels. On some plans there's the glib statement, "Wheels may be built up using bamboo spokes and paper hub," leaving the builder to beat his head against the wall figuring out how to do it. Bill Hannan has come to the rescue with his marvelous little clear plastic wheels, on which you can scribe or paint the spoke pattern . . . or just leave them clear and pretend the wheels are constantly spinning. But what if your model isn't the correct size for Bill's wheels, or, even if you've figured out how to make bamboo spokes you don't like them because the spokes are too thick?

There is a way out, guys. "The handy-dandy spider-web method to peace and happiness in the wirewheel business" is here! With it you can build perfect scale spoked wheels, with any number of spokes, and any lacing pattern you care to incorporate. Using this method I've built 54-spoke triple-lace automobile wheels, 48-spoked double-laced airplane wheels, in diameters ranging from one inch to four inches. The technique is always the same, only the materials and sizes change. And for any of you who might be worried, let me assure you that the wheels are strong enough to be the only things left intact after a terrible crash.

THE JIG. Begin by making a jig, which is no more than a cylindrical form with a hole through its axis. The diameter of the form matches the inside diameter of the wheel rim to be built. If you have a lathe, make the jig from hardwood or metal and drill a hole in one end. If you don't have a lathe (I don't) make the jig from a piece of cardboard



HUB AND RIM IN POSITION ON JIG

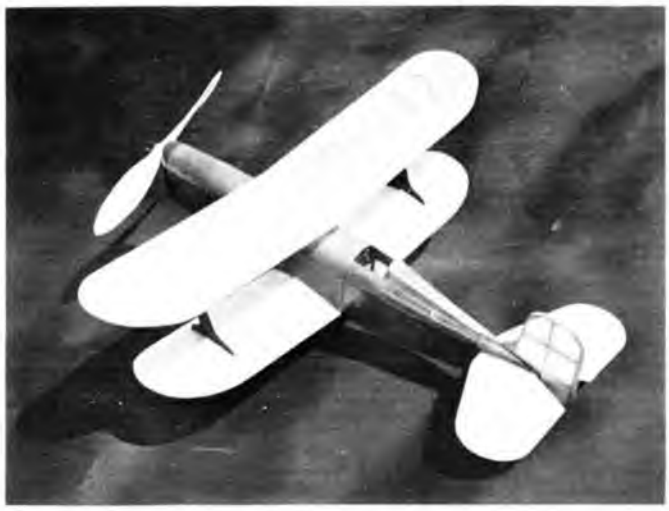


1930 LAIRD LC-DE SPEEDWING JR.

Walt Mooney 12-28-70

DEC 1971 VOL 1 NO3

Photos by Fudo Takagi



This is Walt's son Curtiss Mooney's completed Laird. Long nose moment eliminates need for nose weight. Williams Bros. molded nylon propeller.

The Laird LC-DC doing its thing....flying up a storm! With stretch-winding of the rubber as described in text, long flights are guaranteed!

PEANUT SCALE LAIRD LC-DC

By Walt Mooney

Peanut scale of a little known biplane from the Giant's Hangar of the Golden Age of Air Racing. Long nose moment of the Laird LC-DC makes it an easy plane to balance, gives long motor run.

● This is an extremely pretty little biplane racer. Its configuration is particularly suitable for a rubber powered scale model. The long nose and the long tail length make for an easily balanced and stable flyer. Three models of the Laird LC-DC were built and they have all proven to be nice flyers. All three models are capable of flights of more than 30 seconds.

The model construction is strictly conventional. As drawn it will not result in a particularly light weight Peanut Scale model, However, careful attention to wood weights and the use of slightly smaller wood sizes will result in an indoor type model capable of even better flight durations.

The real airplane had a lot of stringers fairing out the fuselage. These are indicated as dash-dot-dash lines on the drawings. Omission of one or more of the side stringers in the interest of simplifying the model will hurt the overall appearance very little unless you worry about the last scale point in a contest. Flight wires can also be omitted in the interest of simplicity and less flight drag if desired.

For those who are interested in scale details and the utmost in judging points, good three-views of this airplane and other interesting racers are available from R.S. Hirsh, 8439 Dale Street, Buena Park, Calif. 90620. Write for his

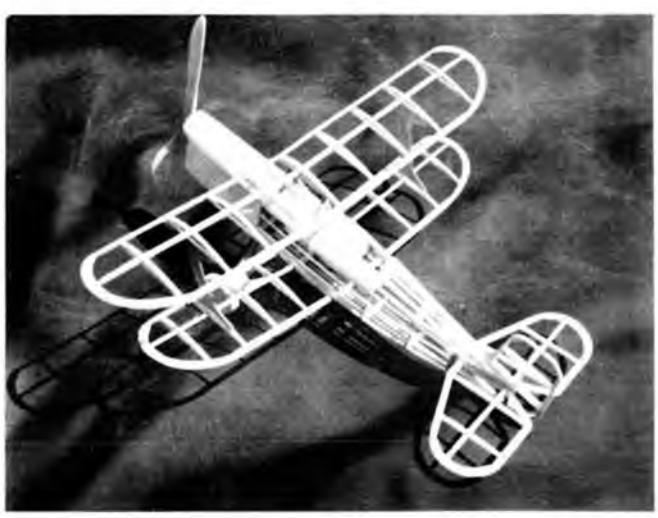
The model should balance about an eighth of an inch aft of the lower wing leading edge. No downthrust was required on the models built and the maximum up elevator adjustment was used.

Since the model structure is strictly conventional; a box fuselage with formers and stringers, single spar wings, and sheet balsa surface tip outlines, only a few specific comments will be made.

First, the wheel diameter is rather large for a Peanut Scale so it is important to keep them light weight. Make them out of balsa or better yet mold them on a Vacu-form over a balsa or hardwood form.

Second, the struts for the wing and landing gear will take quite a beating so

Continued on page 45



Here are the "bones" of Walt's Laird. He's using a larger , balsa prop in an attempt to increase duration. Wing and landing gear struts 1/64 ply

A three-quarter front view of Curtiss' Laird. Peanut scales are so small and light that they survive many "crashes." Great for beginners too!!

tubing (paper towel tube; or model rocket tubing, which is available in many diameters from hobby shops) by plugging the ends with balsa discs turned on a drill mandrel, then installing a length of brass tubing through the axis. At any rate, what you want to end up with is a cylinder with a concentric hole in it. For wheels of up to 2 inches in diameter, a 1/16 inch hole is sufficient. The jig need not be more than 6 inches in length for convenient handling.

WHEEL RIM. Tape a layer of Saran Wrap or waxed paper around the jig. Now cut a strip of bond paper about 2 inches wide and long enough to wrap around the jig four times (or more for bigger wheels). Coat the paper with epoxy and wrap it tightly around the jig, making sure there are no bulges or wrinkles. (This technique is identical to making tissue paper tubes for indoor model wing post mounts and the like.) Let the laminated tube cure completely before removing from the jig, then discard the Saran or waxed paper. You now have a rigid paper reinforced epoxy cylinder, from which the wheel rims will be cut.

SPOKE SPACING. Cut another strip of paper and wrap it aorund the outside of the cylinder, and mark the circumference on it. Remove the paper, spread it out, measure the circumference with a rule, and divide that dimension by the number of spokes on one side of the wheel (half the total number of spokes). Set a pair of dividers to the resultant dimension, and mark off the spacing along one edge of the paper strip. For a 48-spoke wheel you now have 24 evenly spaced marks on the strip. Wrap the strip around the cylinder again, placing it in from the end of the cylinder a distance equal to 1/3 the final width of the rim to be made. In other words, the first row of spokes on a rim 3/16 inch wide will be 1/16 inch from the edge. Using the marked paper strip as a guide, drill the second row of spoke holes 2/3 of the way in from the edge, and staggered halfway between the holes in the first row. After all holes are drilled, remove the paper guide strip.

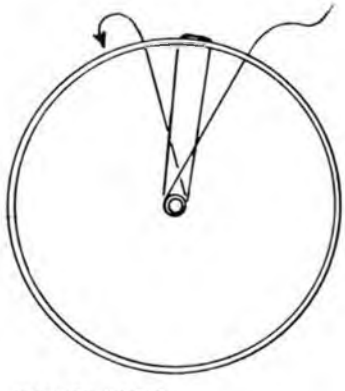
WHEEL HUB. The hub is built up of aluminum tubing. In this example, the inner tube is 1/16 inch OD, and slips into the hole in the jig. Slide a small length of 3/32 inch OD tubing over the inner tube, then a cardstock disc, another length of tubing, another disc and the final piece of tubing. This will give you a hub with the appearance of a typical bicycle hub. Epoxy the whole thing, then slip it into the jig. The tube should protrude from the back end of the jig, where it can be retained by a piece of tape; this keeps the hub from sliding forward out of the jig when spokes are being laced.

Start with a set of "wire" wheels and then build a plane to suit. Don Typond's Bristol Prier, built from Obscure Aircraft plans (available from Bill Hannan Box A. Escondido California, 92025)

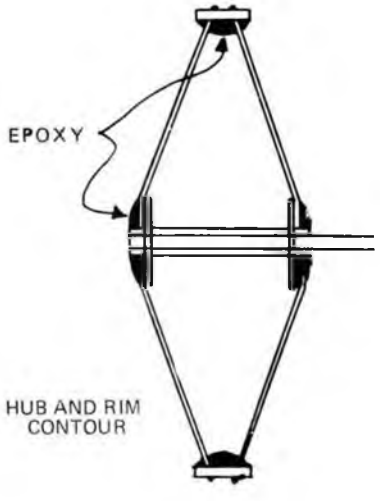
THE SPOKES. Slide the wheel-rim cylinder onto the jig, allowing the drilled end to overhang the jig and line up with the center of the hub. Tape the cylinder to keep it from shifting. I make my spokes from nylon monofilament thread or fishing line, which is easier to handle than wire. Select a diameter corresponding to scale thickness. (The holes you drilled in the rim should match the thickness of the thread, obviously.) Begin lacing by passing the thread through the rim, around the hub (outside the card disc), back out through the next hole in the rim, over to the next hole, through the rim again, around the hub, and so on. NOW YOU KNOW! The spokes are laced with one continuous piece of thread . . . they're NOT individual spokes! Obviously you must start by lacing the "back" row first, then the forward row. When all the spokes are laced, glue the tag ends of the thread to the outside of the rim and cut off the excess thread.

FINAL TOUCHES. Take a razor saw and CAREFULLY cut the wheel rim from the remainder of the cylinder, using the original paper drill-guide strip as a guide for the saw blade. You should now have a wire wheel with a concentric hub. The thread will have bunched up around the hub where it was wrapped around the tube, and a nice fillet of epoxy cement can be applied to this area. This will cement the thread to the hub, and provide a finished look to the

Continued on page 48



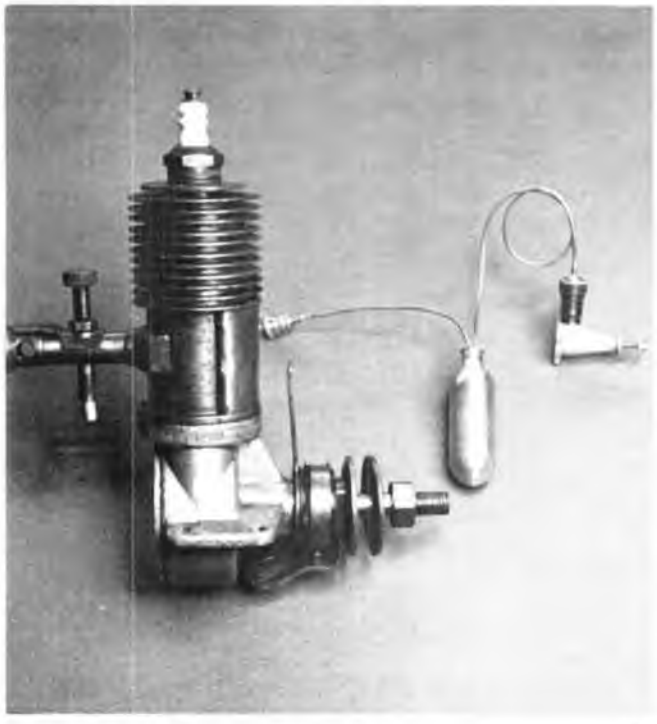
SPOKE LACING



HUB AND RIM CONTOUR

Fred Militky flying the electric powered R/C model that he demonstrated at the World Championships. Plane spans 63 inches and is powered by two Micro-Mo motors turning folding rubber powered type props. Weight is about 2 pounds. Radio is Grundig Varioprop by Graupner.

"PHOTOGRAVIEWER"



The best known ignition engine of all times , the Brown Jr., poses with it's new little CO_2 brother. Full size drawing of little one in Nov. issue.

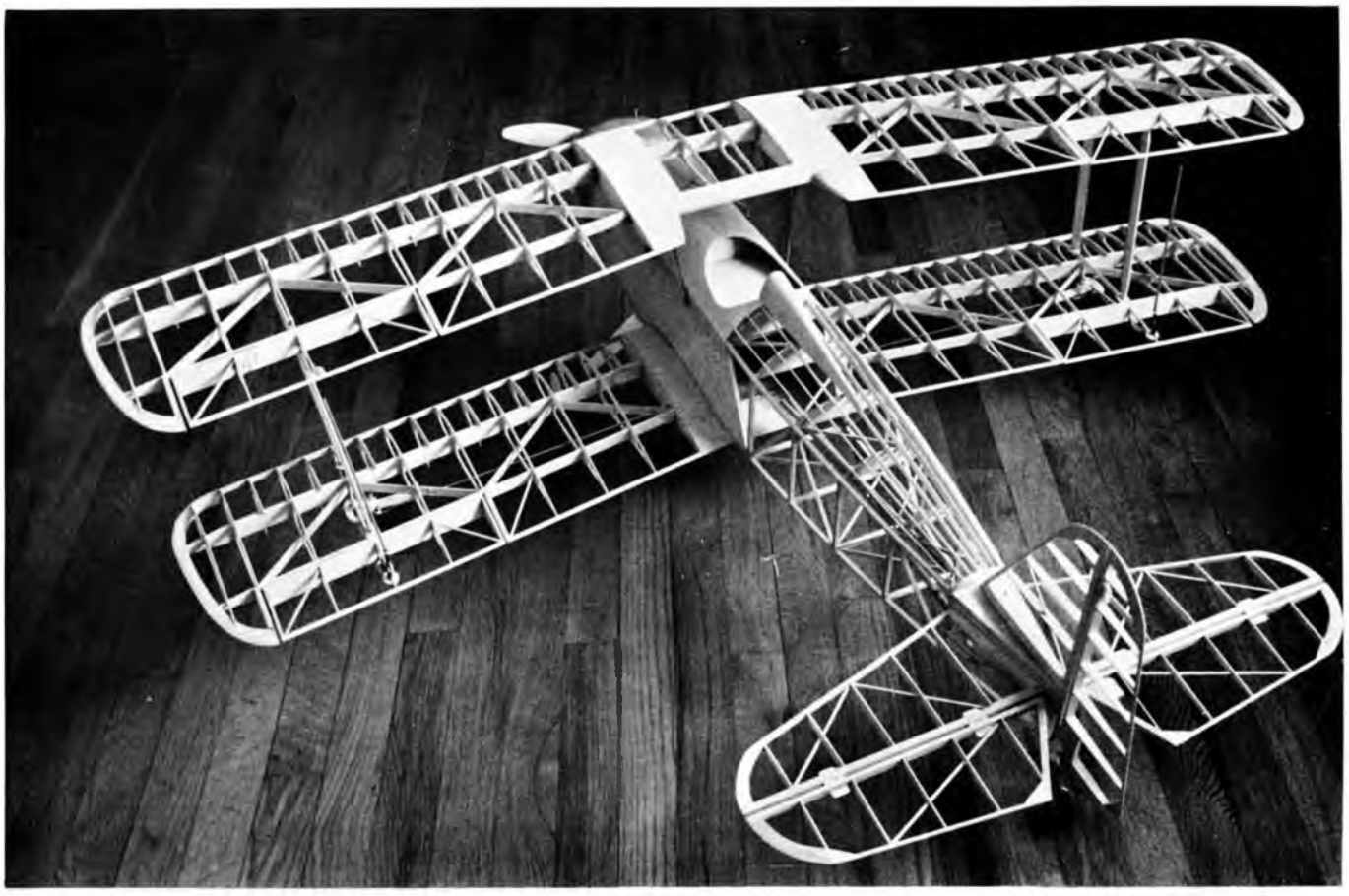
A close-up of the battery-powered R/C job flying above. Varta Deac cells supply 7.2 to 9.6 volts for the electric motors. R/C shut-off for soaring.

Mystery Moth! We've had this picture on the wall for several years , and now can't remember who built it. Are you out there? Please check in!

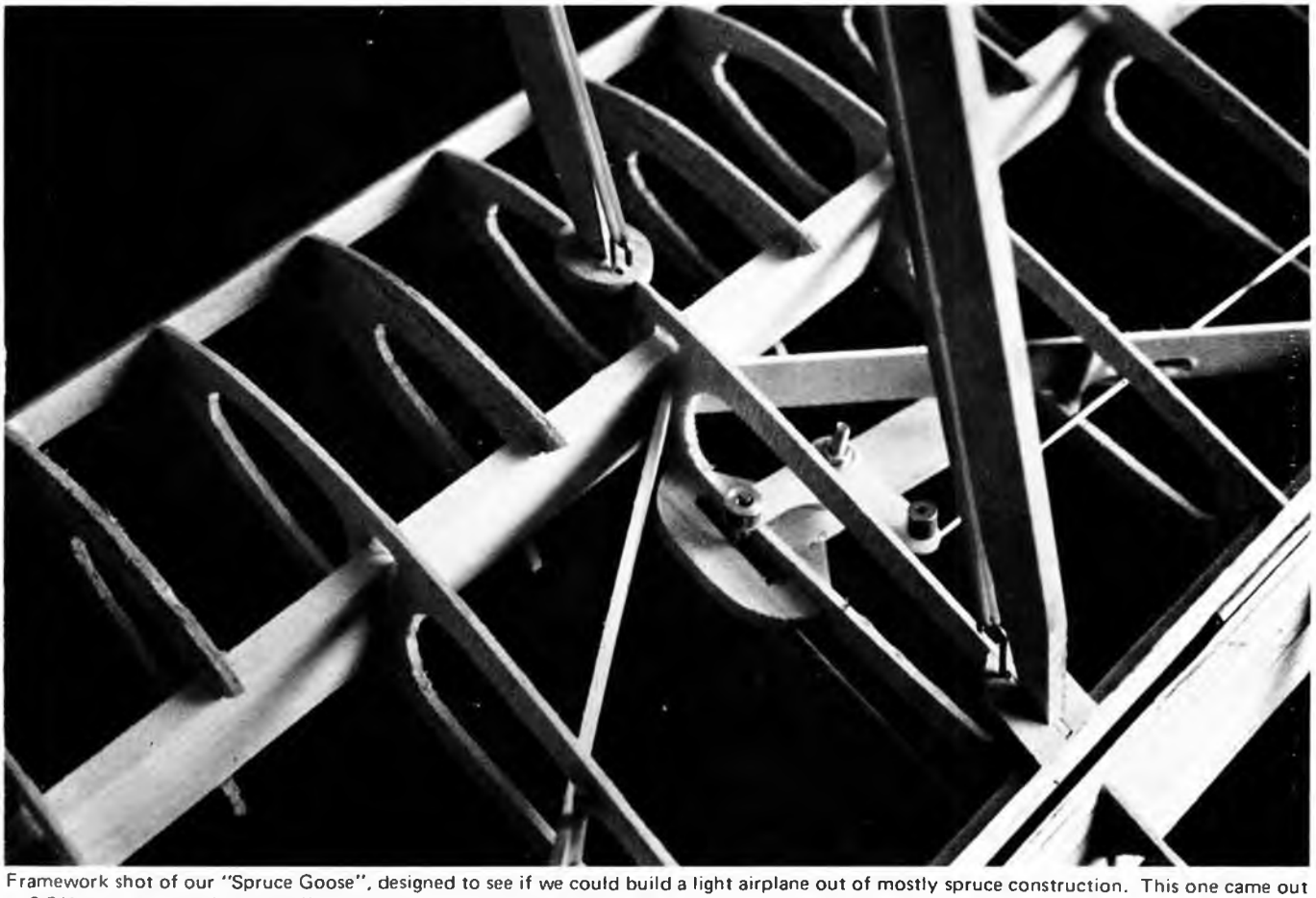
Don Butman and son Darryl, Woodland Hills, Cal. love Peanuts, maybe the eatin' kind too! They're both holding Jodels built from Sept. plans.

Rudy Black's Bi-Prentice, first model built from our "short article" plans in Nov. issue. Needs no ailerons but will fly inverted if YOU can!

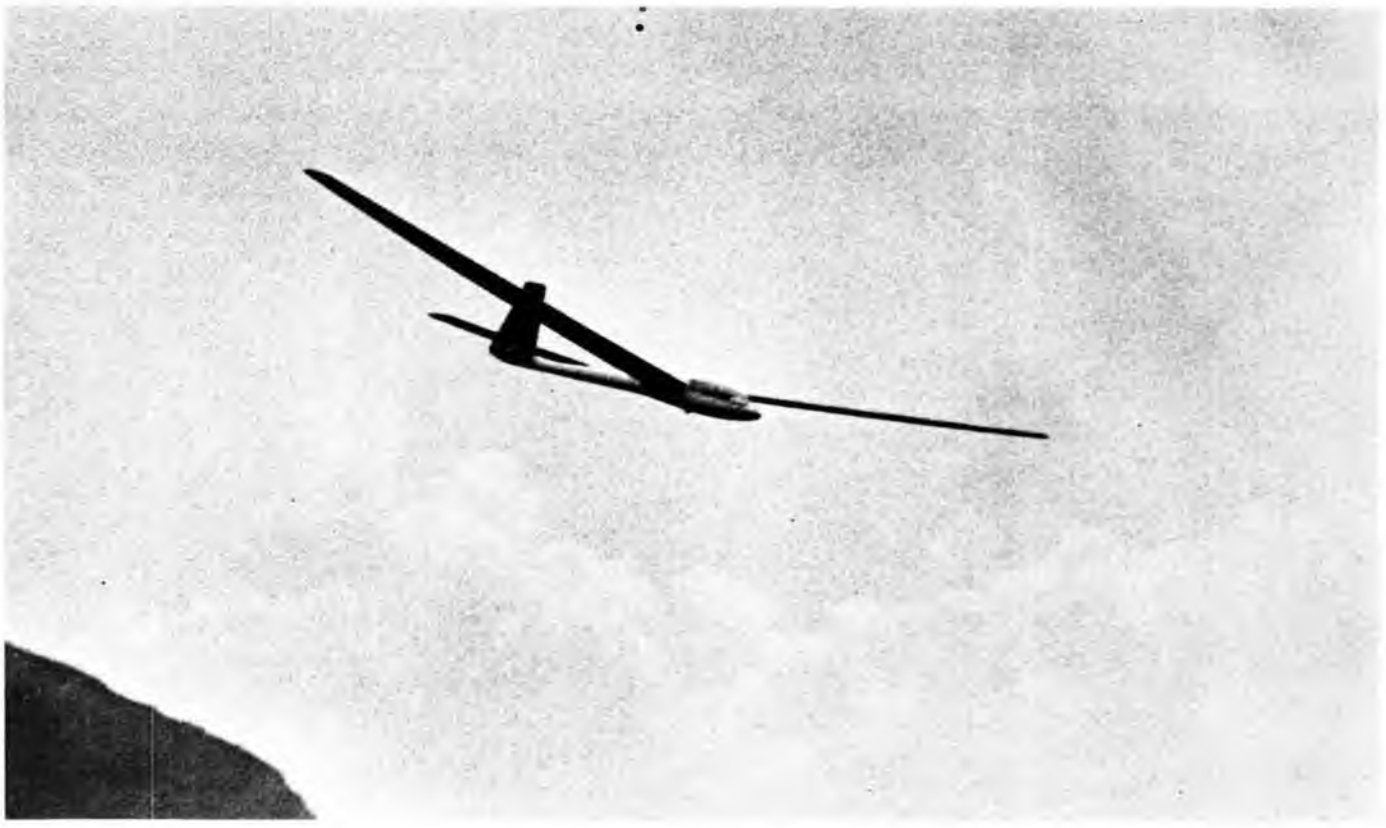
Our 7-1/2 foot, 3 inch scale, 15 pound Gipsy Moth which placed 3rd in R/C Nats scale, 1965, and 4th in 1966. Flew at scale speed with Fox .59 after failing to get off the ground with a Forster .99 at 1961 Nats. Had servo in each wing out where aileron pushrod is located. With today's methods it could weigh about 10 to 12 pounds.



Come on guys, I'm running out of pictures of my own airplanes. Let's have some interesting and dramatic photos of your scale ships, out-of-the-rut projects. Juicey close-ups of details are great too! This one is a close-up of the wing framework, struts, aileron linkage on the "Spruce Goose."



Framework shot of our "Spruce Goose", designed to see if we could build a light airplane out of mostly spruce construction. This one came out at 6-3/4 pounds ready for takeoff! Balsa version was published in M.A.N. Redrawn plans for S.G. will be available soon. Hartman makes FG cowl.



Yoshiro Sato's Cirrus drifts lazily over the field at Takigahara, near Mount Fuji in Japan, during a demonstration flight at annual free-flight contest.

R/C SOARING

By Le Gray

A new "regular".....an omnibus feature dedicated to R/C Soaring and Sailplanes. This month takes food for thought from the Free-Flighters plate of tricks.....turbulators.

● "Get three R/C sailplane pilots together and you'll get four opinions"... to paraphrase an old saw. A truism of model builders in general, perhaps, but especially apropos of soaring enthusiasts.

That's one of the many fascinating aspects of R/C soaring. It's a new world of challenge...in design, theory, construction, size, operation. There are basic principles, but no set patterns, and much divergence in design concepts. This fast growing facet of of the hobby is an invasion of an unexplored realm of flight. "Not so," cry the classic free-flight fans, "we've been thermal soaring for years." 'Tis so," comes the snappy response, "Free Flighters have never thermal soared a lick. Our machines...which upon release were committed to the laws of physics and the whims of meteorology...thermal soared. But we didn't actually have control of our machines during their thermal soaring flights."

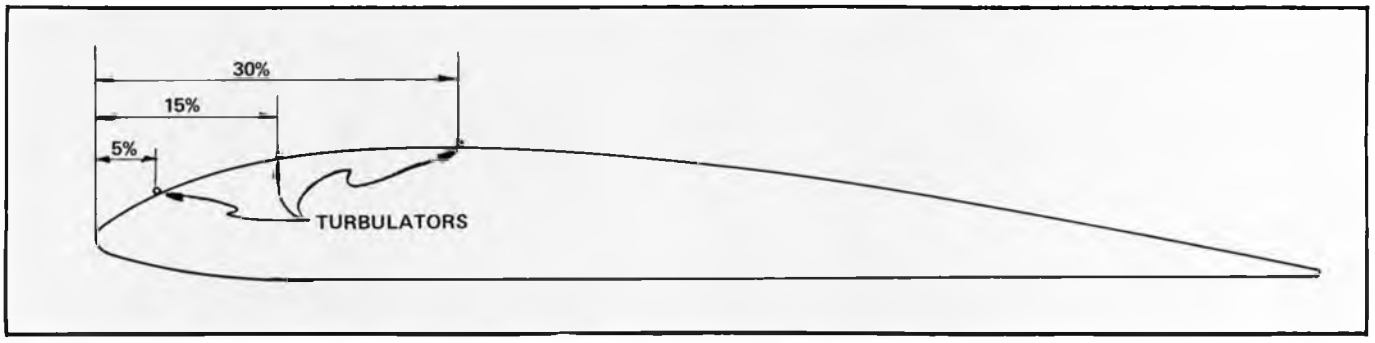
This play on words is not a putdown of free-flight. Free-Flighters are one of the most devoted, enthusiastic, self-advancing and competitive group of hobbiests in the world...and a cornerstone of the sport. But, by definition, a free-flight model, once airborne, does not have the capability to respond to operator decisions which are made subsequent to its release. And that is a great part of the challenge and attraction of free-flight...to outguess whatever opposing forces and utilize whatever supporting elements that may be present during the next flight.

The statement stands: R/C soaring invades a new realm of flights. Low speed...very low speed...aerodynamics of fixed wing aircraft is a most undeveloped science. Never in the history of man have fixed wing machines, under the direct and immediate control of a thinking being, sustained flight at air speeds as slow as those of R/C sailplanes. Never before has low altitude thermal activity or the phenomenon of sub-micro meteorology been consciously explored...much less exploit-

So the question arises how to best attack the problem of sustaining flight by interpretative utilization of natural forces. To date, the answer is another question: "Who knows?" There are theories and there are concepts and there are ideas and there are design philosophies...which brings us back to the

the lead-in sentence: "Get three R/C sailplane pilots and you get four opinions." There may never be a single, pat, reliable answer, but a lot of guys are working the problem.

Much of the aerodynamic theory utilized in the design of model aircraft today stems from data developed in NACA..now NASA..wind tunnel tests conducted in the 1930's. This is especially so with reference to wing air foil sections. Compared to current



full-scale flight parameters, the NACA work is definitely low-speed investigation. Still, the NACA test speeds...and Reynolds Numbers...are much greater than those of R/C sailplanes. But even with its limitations, the NACA reports are about all the published data in existence.

Airfoil sections are a never-ending source of discussion...argument. There are those who expound the virtues of the slender, slightly undercambered Eppler sections....computer designed expressly for model airplanes by Dr.R. Eppler, world recognized aerodynamic genius. Other modelers hold to the ever popular NACA four-digit series, such as the NACA 4409 or 6412, which were developed for full-scale airplanes back in the '30's. Then there are those who reportedly design original airfoil sections by tracing around the outside sole of a man's dress shoe. French shoes are claimed to offer particularly good lift/drag ratios. Italian shoes are favored for penetration. Designers with a more scientific bend identify with a No. 48 Ships Curve. And all seem to work...to some degree or another. Then along comes a German manufacturer who produces a melmac-fuselage R/C soarer with a big, thick, flat-bottomed wing section, and it holds its own with most any design in most any competition. According to many "experts," this Teutonic terror just shouldn't perform...but it does and does and does.

Some model sailplane designers go through great and lengthy analysis of aerodynamic problems, and fill numerous pages with comparative data and force calculations. It would seem that their creations should be superior if their base data and interpretations are sound. Other designers approach the problem with a cut-and-try concept, making relatively minor variations to established and proven configurations or principles. A third school of design is represented by students of Wots Available U. This group utilizes existing components...whatever they may be...repairing, replacing and rebuilding only as necessary to maintain the proper number of airborne parts.

One Old Flying Buddy (OFB) in the Santa Clara Valley of California is without doubt one of the world's greatest exponents of "design by evolution." During one period of some three years, OFB never once had a new sailplane...at one time. Over a span of some three or four months, his model would be completely different than it had been earlier, but this change was brought on by increments. One time, a new set of wings. A few weeks later, a revised stabilizer. Next time you noticed, a new fuselage would be connecting the then two-month old wings and three-week old tail. This OFB had one sailplane...but a whole garage full of flyable components, all of which fit with everything else.

We have known designer/builders of

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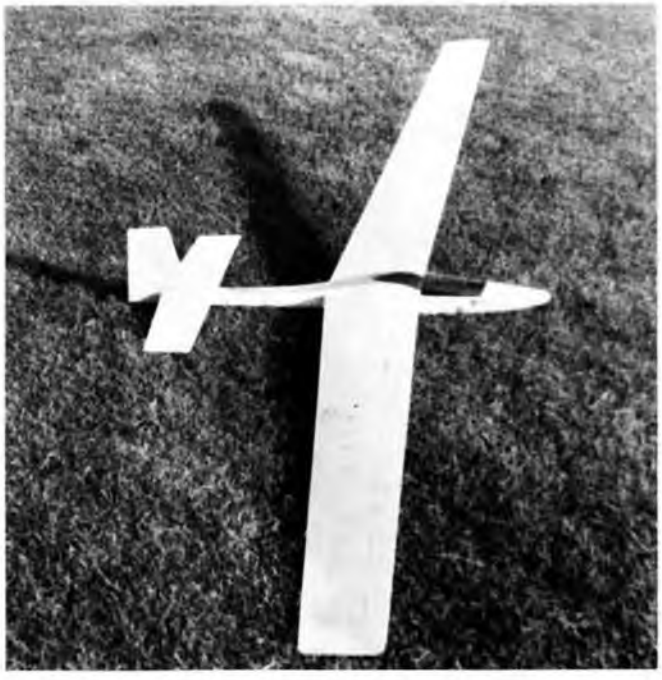
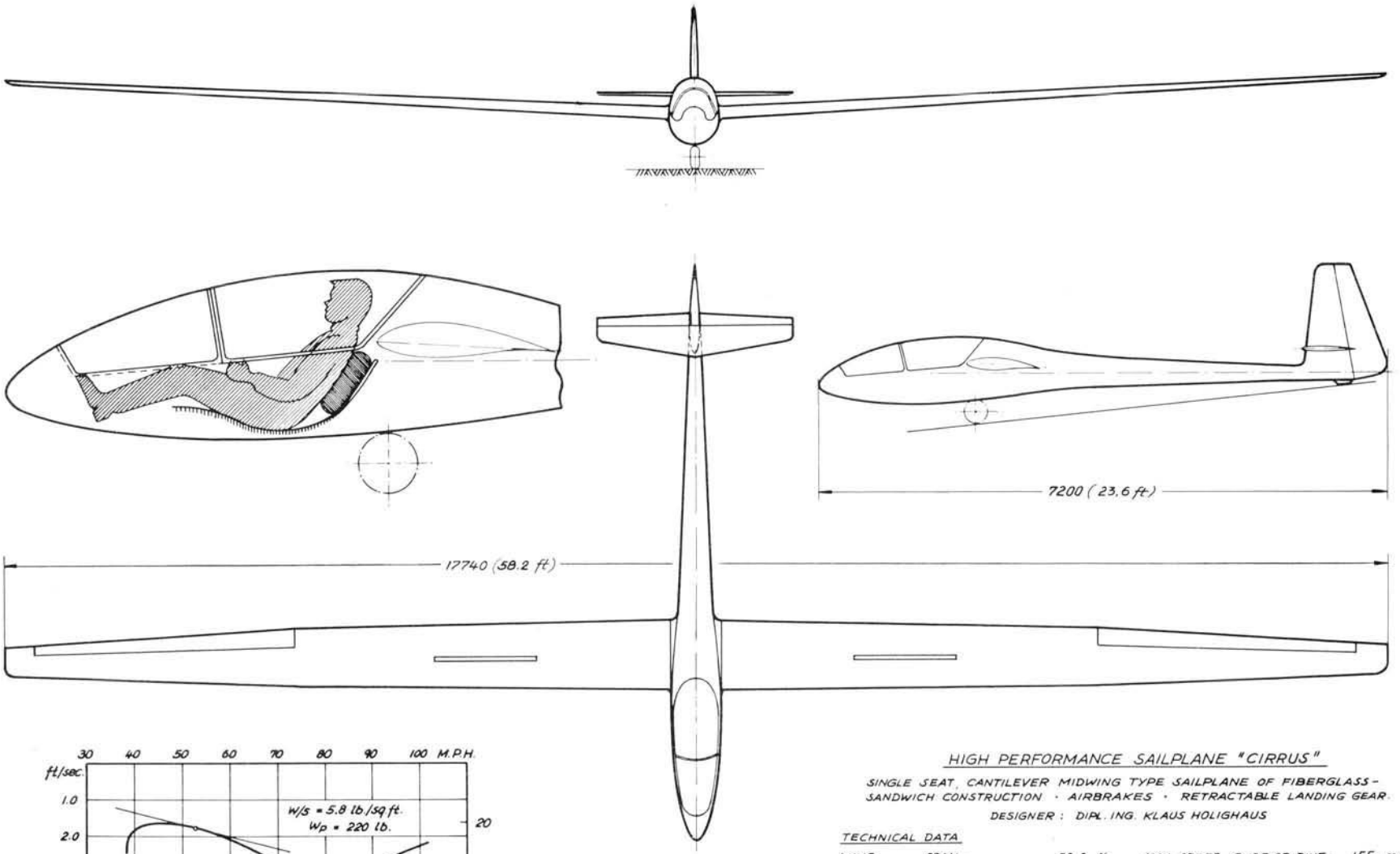
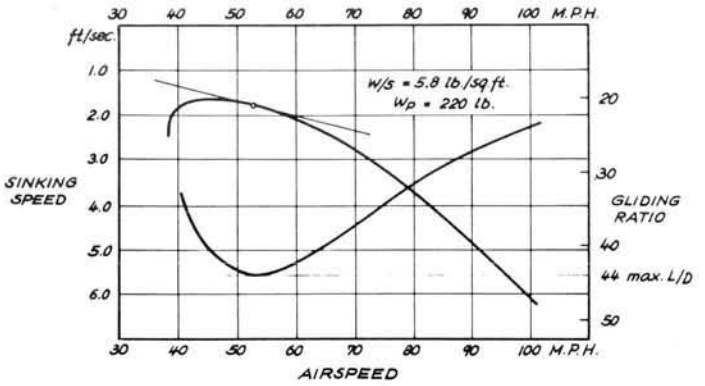


Our columnist Le Gray's "Scorcerer", with turbulators on wing. Tests with sheeted L.E. wing were poor until turbs were added.

Here's Le again, doing his thing (in the usual way, with mouth open) at Lakeview, Cal. John Donelson with Coke, and Frank Colver watching.





HIGH PERFORMANCE SAILPLANE "CIRRUS"

SINGLE SEAT, CANTILEVER MIDWING TYPE SAILPLANE OF FIBERGLASS-SANDWICH CONSTRUCTION · AIRBRAKES · RETRACTABLE LANDING GEAR.

DESIGNER : DIPL. ING. KLAUS HOLIGHAUS

TECHNICAL DATA

WING	SPAN :	58.2 ft.
	AREA :	135.6 sq.ft.
	ASPECT RATIO :	25.0
FUSELAGE	LENGTH :	23.6 ft.
	WIDTH :	24.6 in.
	HEIGHT :	32.9 in.
WEIGHTS	EMPTY WEIGHT :	551 lbs.
	MIN. PAYLOAD :	132 lbs.
	MAX. PAYLOAD :	331 lbs.
	GROSS WEIGHT :	882 lbs.
	WING :	317.5 lbs.
	FUSELAGE :	220.5 lbs.
	HORIZ. TAIL PLANE :	13.0 lbs.

MAX. SPEED, GLIDE OR DIVE : 155 m.p.h.
MAX. SPEED IN ROUGH AIR : 127 m.p.h.
(GUSTS ± 33 ft/sec.)

PERFORMANCE AT W/S = 5.8 lb/sq.ft.

STALL SPEED : 38 m.p.h.
MINIMUM SINK AT 45 m.p.h. : 1.64 ft/sec.
MAX. L/D AT 53 m.p.h. : 44

SCHEMPP-HIRTH KG
7312 KIRCHHEIM-TECK
WEST GERMANY

KIT REVIEW

Chuck Colwell - Builder
Bill Northrop - Reporter

Midwest's E-Z JUAN, a high performance R/C soaring glider, is this month's subject for product review. A pair of Heath GDA 19-41 servos bend the control surfaces.

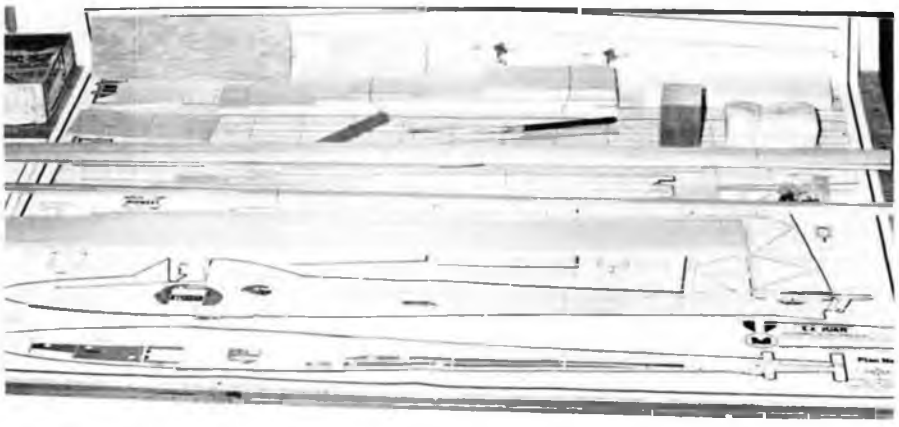
Photos by Chuck Colwell

● One of the first American produced, high. performance soaring glider kits to hit the market at average consumer prices, has just been introduced by Midwest Products Co., Hobart, Indiana. Priced at $29.95, the nine foot span soarer is called the "EZ Juan" (pronounced "Easy One").

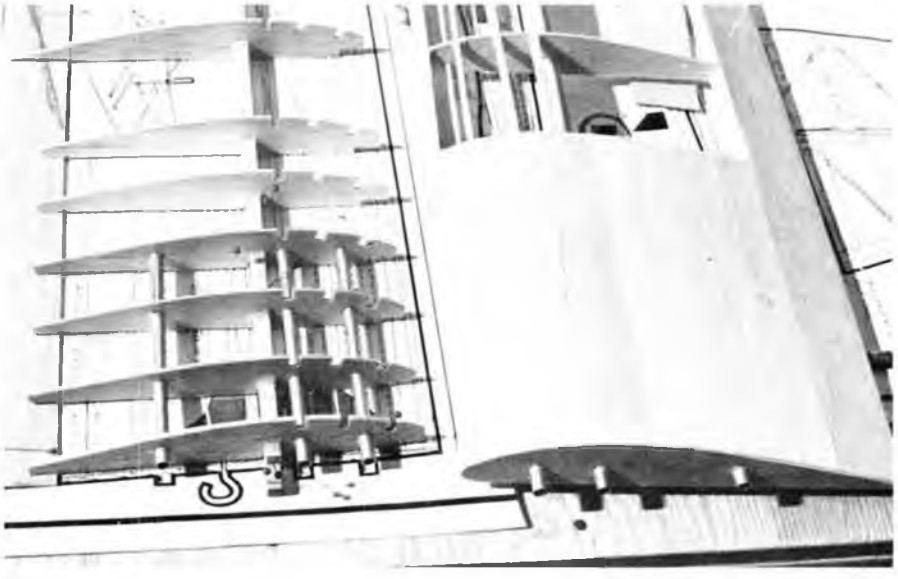
Le Gray, Canoga Park, California, a prominent R/C soarer (LSF No. 009, Level 3) and full scale glider pilot, also the "M.C." for *The Model Builder's* R/C soaring column, was the designer. The ship lives up to its name in being very easy to build, without any sacrifice in appearance or performance.

Integrated circuit used in Heath GDA 19-41 servo pictured with a dime indicates size.

Our review builder, Chuck Colwell, shows us what 9 feet of glider looks like when standing on one tip. Transmitter for Heath radio used in test is five channel unit, GD-19.



The EZ Juan kit spread out on the workbench for inspection. Kit includes all wood, die-cuts, and a complete set of hardware. Price is lower than most imports at $29.95



Multi-spar wing construction features "turbulator spars" forming the top leading edge rather than sheeting. Read about this in Le's column. Ply ribs hold wing joining tubes.

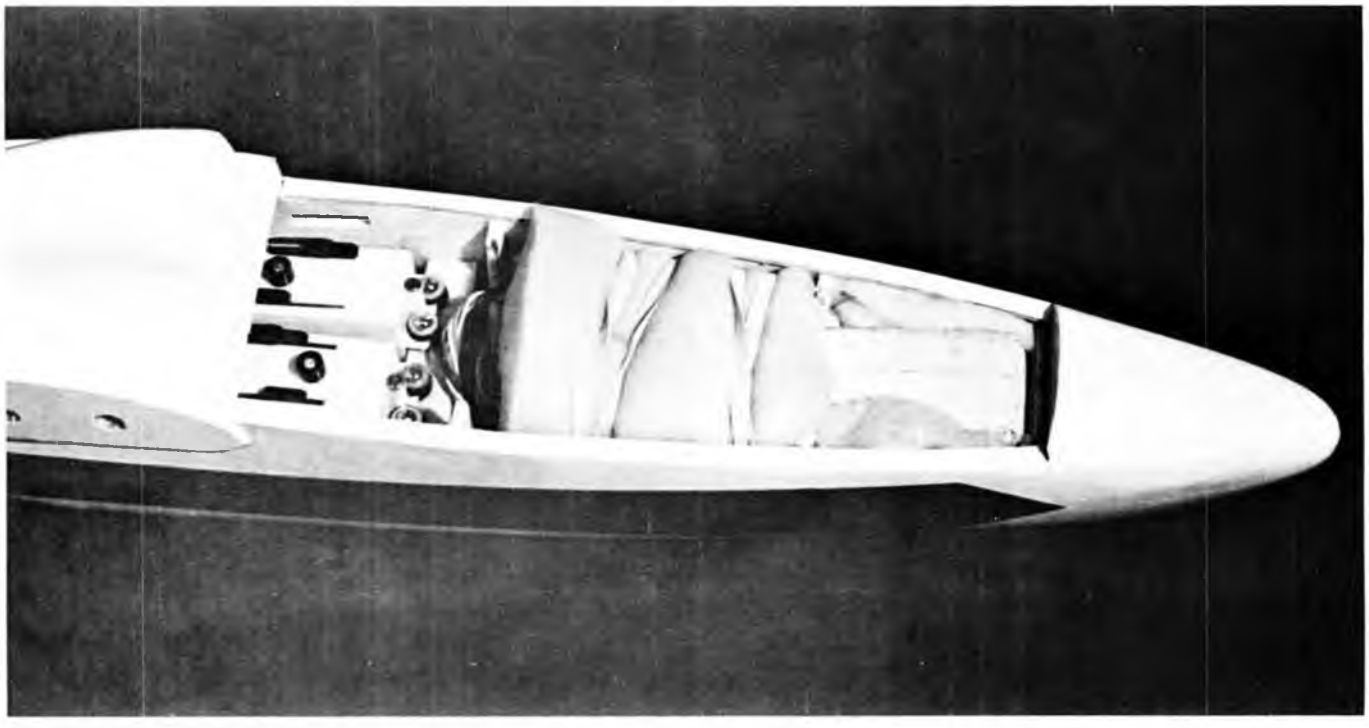
When you read Le's article elsewhere in this issue, you'll see that the multi-spar wing construction was not devised as merely a place to hang Monokote, but rather, to provide turbulator action for a more efficient airfoil. The fuselage has rather squared off lines, but is designed in such a way that it's functional simplicity is most appropriate. Tail surfaces are designed for warp resistant strength and smooth covering with a raised frame about the perimeter. The big aerodynamically balanced rudder is a must in R/C gliding and is particularly useful in slope soaring, where turns are often, of necessity, rather tight and close to the ground.

The Midwest kit is very complete, with all strip and sheet wood of high quality Micro-Cut Midwest balsa. The die-cutting is very accurate and though a few pieces showed signs of "smashing", none of it affected construction of the final results.

The hardware included with the kit is very complete; clevises, hinges, pre-bent wing joining rods, and the aluminum tubing sockets are all provided.

Anyone taking a look at the kit as a prospective buyer should keep one thing in mind. The plans make the plane look more complicated to build than it really is. They're too busy. Dotted lines and grain lines superimposed on each other take a while to sort out.

And no doubt Frank Garcher is going



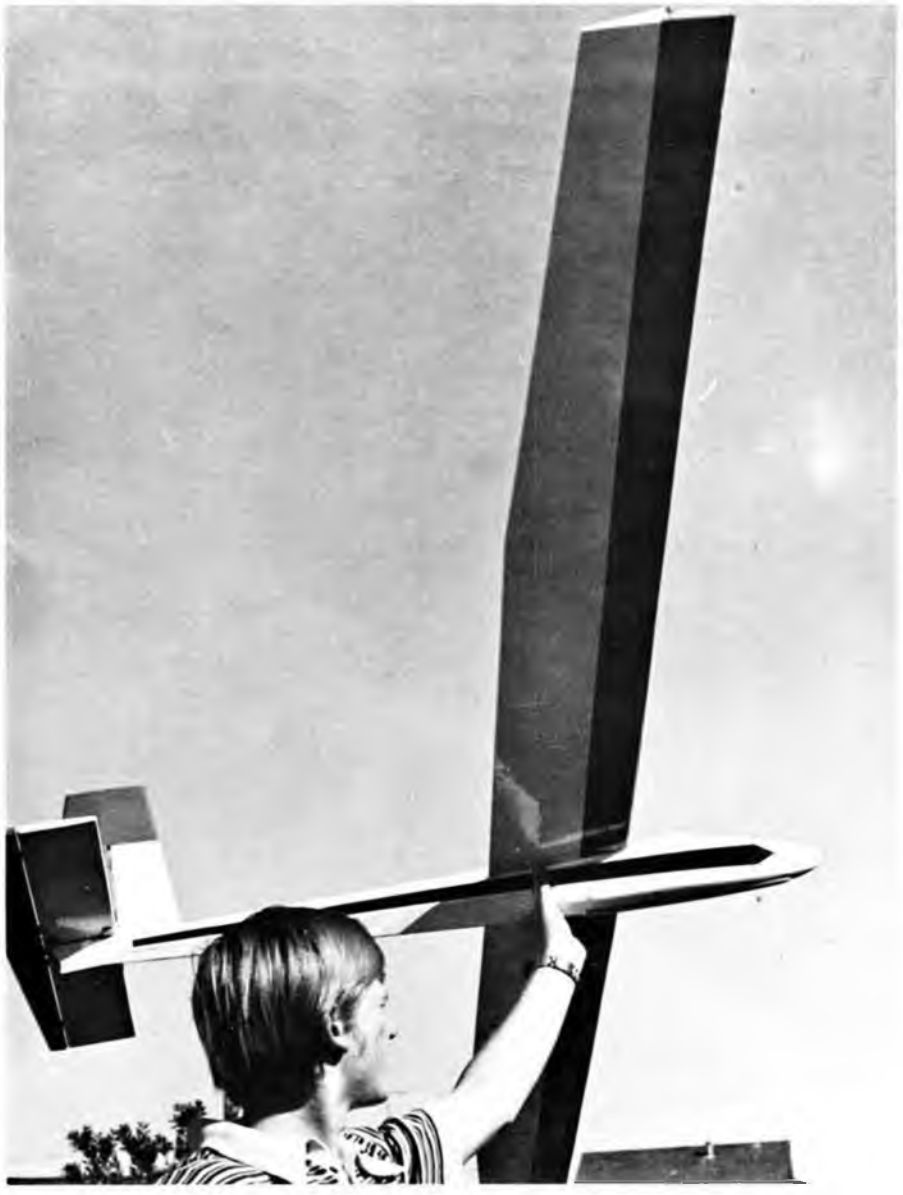
Servos, receiver, and battery, well up forward in the nose eliminate too much use of dead weight. Bulkheads were cut away to allow room.

to get lots of ribbing about the rudder servo installation as shown in the top view. If you hook it up according to the drawing, the only way you can turn to the right is to turn left for 270 degrees and then go straight! The Kraft KPS-10 servo is shown with the rotary output arm pointing straight toward the tail and the pushrod clevis attached thereto. With the rudder horn on the left side there's no way in the world to get a right turn! Oh well, a new hole farther to the left side of bulkheads No. 4 and No. 5 or moving the servo a little to the right, should take care of that situation.

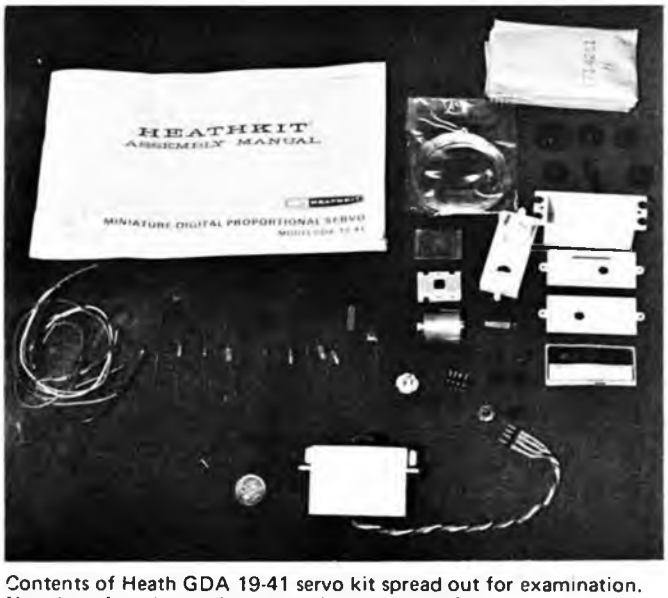
Getting back to the simplicity of construction, Chuck built the EZ Juan in a little over two weeks, and that included stopping to take photos! He was also aided and abetted by using Monokote for the sparkling smooth red and white covering.

As the pictures indicate, Chuck built and installed two Heath GDA-19-41 servos to go with his GD-19 radio system. Also shown in one photo is the integrated circuit that helps keep the servo weight down to 1¾ ounces, in addition to simplifying construction.

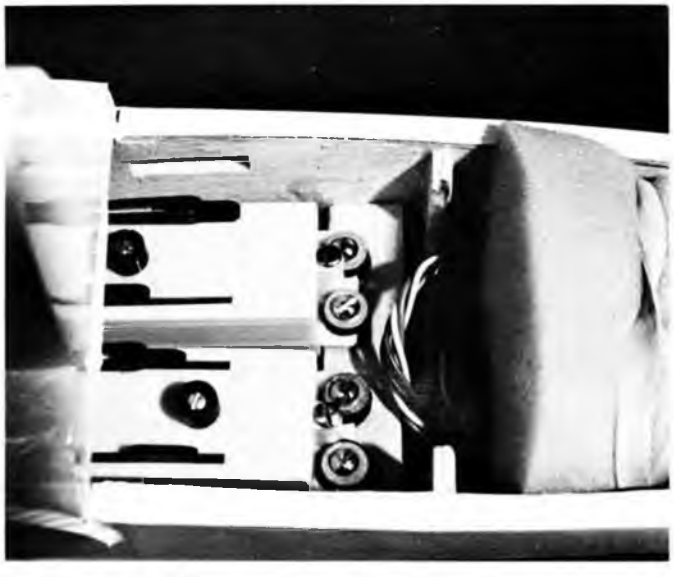
Frank Garcher and Midwest Products should be commended for selecting a well proven design and then following through without modifying for kitting purposes. By today's standards, the price is reasonable, and no doubt the EZ Juan will put many modelers in touch, for the first time, with the great sport of R/C soaring . . . . even if they can't turn to the right! ●



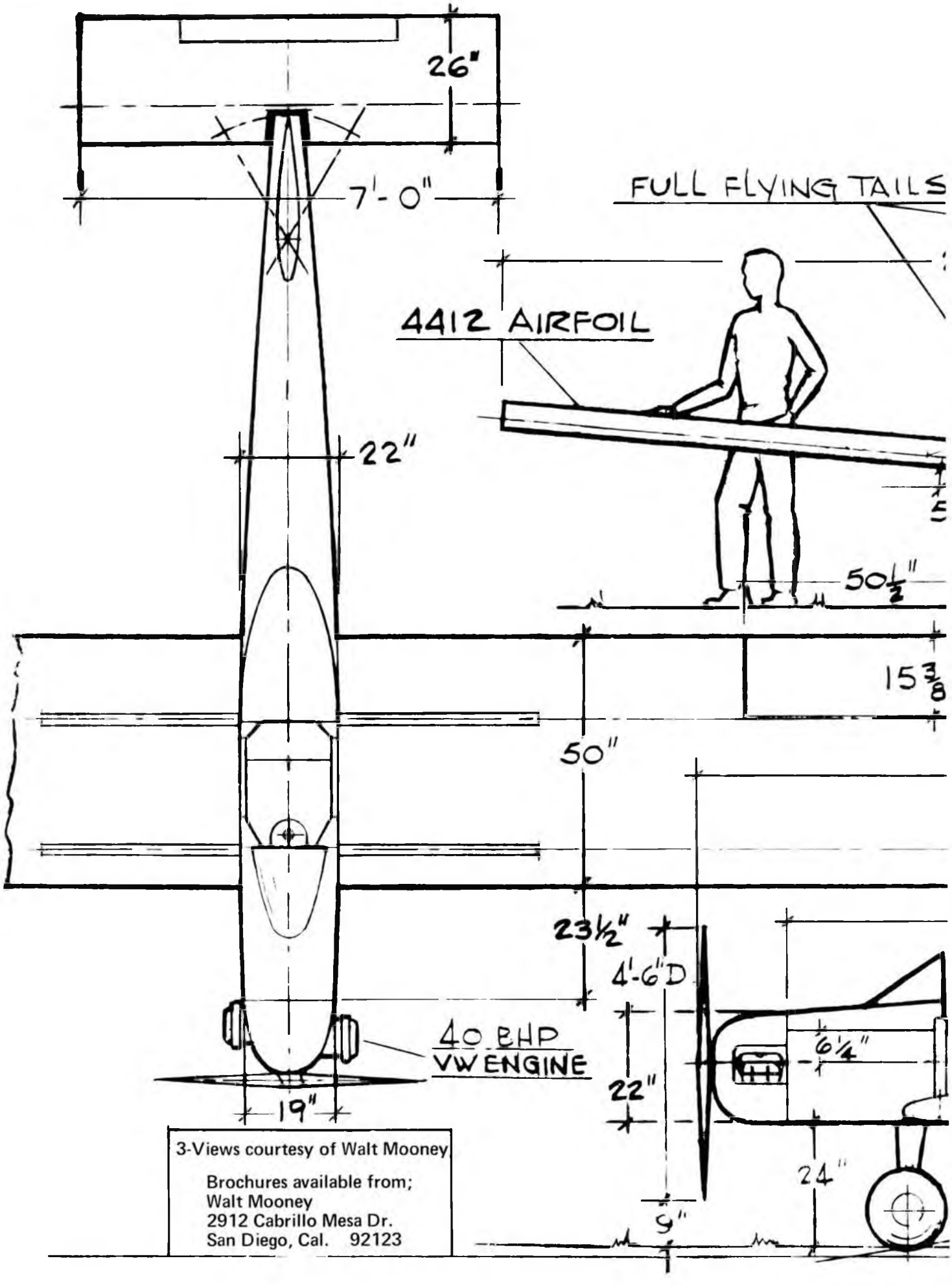
A neighbor holds the EZ Juan up for an underside shot by Chuck. Two tone finish is white and red Super Monokote. A plywood skid protects the fuselage bottom from rough field landings.



Contents of Heath GDA 19-41 servo kit spread out for examination. Note how few electronic parts go into the amplifier.

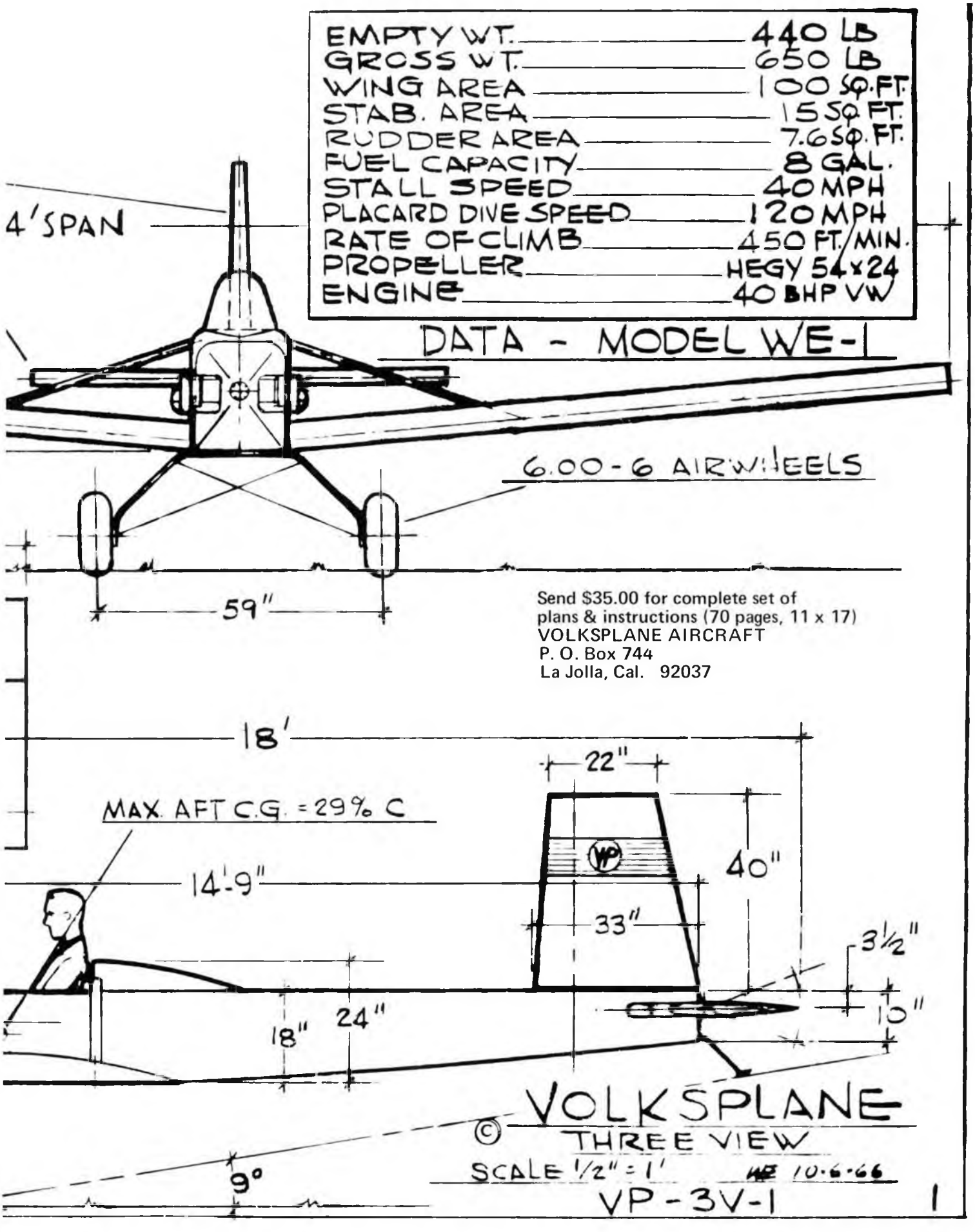


A close-up photo of the servo installation. Although this is the one application where double stick foam tape could be used, Chuck used screws.



3-Views courtesy of Walt Mooney

Brochures available from;
Walt Mooney
2912 Cabrillo Mesa Dr.
San Diego, Cal. 92123


EMPTY WT. 440 LB
GROSS WT. 650 LB
WING AREA 100 SQ.FT.
STAB. AREA 15 SQ FT.
RUDDER AREA 7.6 SQ. FT.
FUEL CAPACITY 8 GAL.
STALL SPEED 40 MPH
PLACARD DIVE SPEED 120 MPH
RATE OF CLIMB 450 FT./MIN.
PROPELLER HEGY 54x24
ENGINE 40 BHP VW
DATA - MODEL WE-1
4'SPAN
6.00-6 AIR WHEELS
59"
Send $35.00 for complete set of
plans & instructions (70 pages, 11 x 17)
VOLKSPLANE AIRCRAFT
P. O. Box 744
La Jolla, Cal. 92037
18'
MAX. AFT C.G. = 29% C
14'-9"
22"
40"
33"
3½"
10"
18"
24"
9°
VOLKSPLANE
© THREE VIEW
SCALE ½" = 1'
10-6-66
VP-3V-1
1

Soaring . . . . *Continued from page 33*

every category. If competition success is a measure of merit, then it's still a toss up as to which approach is best. In numerous instances, followers of each philosophy have walked away with the big hardware. If for no other reason, because pilot skill can make a lousy design look good or a good design look lousy. But all else being equal, to date, no single concept or approach to the design of R/C sailplanes has been proven superior to all others.

Which brings us back to the lead-in ...three flyers and four opinions. Nobody really knows. At least not yet. We're in a new sphere...looking for answers and having a blast while we do.

You don't have to be a designer or a "scratch builder" to join the fun and contribute to the total knowledge. Of course, you can always just sit back and listen to the more vocal experts tout their personal theories...and have some laughs...or you can participate and maybe help develop some answers.

How about this for starters? Try turbulators on the wing of your favorite sailplane. What are turbulators? Briefly, a turbulator is a mechanical device used to upset or disturb the air as it moves over the surface of a wing, thereby creating a turbulant airflow. Without getting over our heads...which could happen very quickly...theory has it that, at low air speeds, a turbulant airflow "holds on" to the top surface of a wing for a greater distance back from the wing's leading edge than does a non-turbulant airflow. That is, a turbulant flow "separates" later and thereby follows the contour of the airfoil further at any given angle of attack. The pay-off, theoretically, is that a properly turbulated airflow will provide for a more efficient wing ...a better ratio of lift to drag.

If theory holds, a turbulated wing should, when compared to a similar but non-turbulated wing, provide several desirable features. It should have better slow-flight capability...useful in a tight, thermalling turn or landing touch down. Stall break should be more gentle...allowing safe flight closer to the point of stall without great loss of altitude if stall point is reached. It should give better pitch stability, as the wing should have greater inherent stability. And better penetration is another "plus" promised by the theorists. To sum it up, the proponents of wing turbulators claim that a wider range of useful operation...faster and slower...is available to us all. If this holds in acutal practice, it's a relatively simple way to achieve some of the desirable features of a variable cambered wing, without the weight or mechanical problems associated with large wing flaps.

So how do we find out? The first requirement is a stable test bed. That's scientific-type talk which means "a flyable model." Next, six hunks of heavy twine...each hunk about half as long as the total wingspan of your "test bed"...about 3/64 to 1/16 inch in diameter. Tow lines used on high-starts or electric wenches may be a handy source. Then, a roll of masking tape and a ruler, and you're all set to advance the knowledge and art of R/C soaring.

Working each half of your sailplane's wing, measure root and tip chords, and make marks at 5, 15 and 30 percent of the chord...back from the leading edge...on the top surface. Lay a length of twine between each set of marks, that is, from 5 percent root to 5 percent tip chord, 15 percent root to 15 percent tip chord, and 30 percent root to 30 percent tip chord. Pull twine taut and tape down ...watching to maintain each in a straight line. One short piece of tape about every three inches will do. Don't put the tape over more than one turbulator...twine...because you may want to change them around later. Work tape down snug to the sides of the twine so that tape makes as small an irregularity as possible.

You should now have two wing panels which are similar...each with three turbulators.

Prepare to fly exactly as before adding turbulators. Don't change trim or ballast in any way. Before launching for the first test flight, you may want to make a couple of hand glides just to convince yourself that your string and tape modification...which by now looks like three rows of drag fences...isn't going to make your fly-

ing jewel drop from the skies like a cardiac duck. At least by hand launching, the thing will only smack from five or six feet and not be nearly as dramatic as a "straight-in" from the top of a winch launch.

About this time, one of those pesky Free-Flighters will show up and have some smart remark like, "Look at Dummy with the electronic toy. He thinks he's inventing." Your response must of course be civil, in keeping with your station in the scientific community. Perhaps a simple but direct, "Go Away" will suffice.

It's true, that for many years, free-flight models have utilized turbulators. Some have been mounted on the wing surface, as described above, while others are supported on small arms extending forward of the leading edge. In the latter case, only one turbulator was used. But perhaps even more prevalent have been model wings of multiple spar construction...with top surface, forward located spars, acting as turbulators. Check the magazines, or visit the next free flight contest in your area. Remember, it's in the interest of science, so don't enjoy yourself. You'll see models ranging from Old Timer Wakefields to the most modern, hot-rod gassie with "turbulator spars." And check the Nordic A/2's for various arrangements of external or forward-mounted systems. These guys are real pros...so why not steal from the best?

With or without endorsement of the originators, however, the problem here is what will turbulators do for us of the R/C soaring fraternity? Since we have airborne control via our magic boxes..."Yeah for da magic boxes"... we should be able to exploit any advantage heralded for turbulators. That is because we can adjust our model's angle of attack...its flying trim and attitude...according to our visual interpretation of meteorological conditions or other desires. That's pretty strong talk for a Dumb-Thumber, but why back down now? If turbulators have provided Free-Flighters with better lift versus drag at a fixed trim point, then we, by varying our model's trim while in flight, should be able to fly slower, or faster, with less loss of altitude than before. That means that we should be able to keep our R/C sailplanes airborne longer, under any given set of conditions, than before. If there's anything to the theory of turbulators, that is.

The best type of wing for this turbulator experiment is one with a sheeted leading edge. A wing without sheeting will require more work to get the twine stuck down to the dips in the surface between ribs. But then, maybe turbulators stretched taut from rib-top to rib-top, bridging over the valleys of the skin...that sounds like the title of an X-rated movie...would give an interesting comparison to those attached to the surface. Why not try and see? A wing that incorporates multi-spar construction....as Midwest's new "E Z Juan"...hardly lends itself to further turbulation, so don't bother. (If you think we didn't catch the plug, you're crazy. wcn)

Now that you've hand glided your turbulated test bed a time or two, go ahead and fly it. Chances are it won't be squirrelly....you probably won't even notice a change in basic flying characteristics. But ease it around for a few flights until you're comfortable. Then try some shallow stalls...maybe with "hands off" recovery. Pull it up into a tight, mushy thermalling circle. With the safety of altitude, gently pull the nose up or feed in "up" trim to see how slow it will fly. Next flight, push the nose down...no, not in a dive ...to see how cleanly it picks up speed, which means penetration. Play with it. Work it. Wring it out to see just what it'll do. How does it compare with before mods? Change incidence and ballast to get best performance. Just because you've added turbulators does not mean you've repealed the Law of Gravity. Look for subtle differences.

Another series of worthwhile experiments is to change the location and number of turbulators. Try some flights with the No. 3...30 percent... turbulator removed. Then put it back on at 40 or 50 percent. Take off No. 1. Try just No. 2. Try all different combinations. Better keep notes so you can get back to what was the best set up.

Or how about this? Try short, 12-inch long turbulators just at the wing

tips. According to theory, it might improve tip stall characteristics...should act like wash-out, but without the drag. Would be a nice feature to have on those low altitude turns when you are trying to stretch in to a spot landing.

Give your experiments a chance. There's no hurry. Several flying sessions will be required to really check things out. Then, compare performance of the best turbulator arrangement versus the original, non-turbulated configuration. If they don't work, you haven't lost a thing and you can always go back. On the other hand, you may have learned something worthwhile. And you may find that participating in the advancement of the state of the art is just a long winded way to say, "It's fun."

So many ways to go. So many things to try. We're pioneers in a new realm to flight. Maybe together, we can get some answers.

Let's hear from you.●

F.A.A. . . . . *Continued from page 47*

pointed out that there was already a law which could be applied to eliminate any flying (model or otherwise) conducted in a dangerous manner and that it would be easy to interpret that law to mean any flying outside of designated areas.

It was also pointed out that while present FAA regulations do not clearly indicate what model flying is legal or illegal there would be no problem establishing this in a relatively short time if a compelling need was indicated. Specific regulations already exist for model rocket and kite flying. FAA regulation in itself, however, was not agreed to be needed or desired, so long as self-regulation by model flyers was felt to be effective.

Unorganized or undisciplined flying was repeatedly stressed as a basic problem, with the danger that one careless flyer could cause all model flying to suffer. The need, therefore, was seen to be for all flyers to get together and prevent irresponsible flying or flying which was not under control and knowledge of other flyers. As in the case of the incident reported the previous weekend a single flight with bad publicity had widespread effect on all model flying in the New York area.

The situation was obviously compounded by irresponsible news media which distorted the facts, but this was acknowledged to be a continuing problem not likely to be overcome. Both AMA and FAA officials agreed that there was almost nothing that could be done to prevent such media reaction or bring about corrections to incorrect reporting...the media had proved to be unresponsive in the past and also in connection with the Oct. 3 incident.

With such a media situation the danger is that misguided public pressure could force government actions which otherwise might not be considered necessary. As in the case which resulted in this meeting the public impression was obviously one of near disaster, although the fact of the situation was that even if the model and the airliner had collided the likelihood of any catastrophe was extremely small. Regardless, the public reaction created by scare headlines and distorted reporting was too far developed to be overcome by retraction or restatement of earlier reports especially since there appeared to be little media interest in setting the record straight.

Aside from the fact of whether or not any real hazard exists concerning model flying in the vicinity of airports, it is clear that there are two problems which need prompt and vigorous action in order to prevent model flying activities from being curtailed due to emotional rather than factual considerations.

1. A major public relations effort is needed to change the image of model flying. The popular public image is one of toys being flown by boys rather than the true picture of miniature aircraft being flown by responsible adults.
2. Much more needs to be done to be sure that all model flying is conducted with maximum safety precautions, with particular regard for operations which might be in the vicinity of full scale aircraft.

The public relations need is twofold: within the aviation community and to the general public. Unfortunately, most aviation people are unaware of the nature of current miniature aircraft activities, FAA people, for example, are generally NOT knowledgeable concerning such activities; the same goes for airline personnel. This is so despite the fact that some of our model flyers are FAA and airline employees.

As in the case of the government people involved in the meeting described, their attitude toward our activity changed upon meeting the model flyers and learning of the true nature of the sport and hobby. The change then resulted in constructive discussion of mutual problems and proposed solutions. Particularly effective was

explanation of the fact that many people were professionals in aviation and in the general business community: airline pilots, engineers, lawyers, dentists, etc. The same appreciation is needed by the general public if the negative aspects of media reporting are to be minimized.

Also helpful would be greater appreciation of the benefits of minature preciation of the benefits of miniature aviation activity: educational, recreational, and inspirational (youth leadership). The activity's positive contribution as a deterrent to juvenile delinquency is well known by those involved but not by others. The same is generally true of the educational benefits concerning creative and scientific teaching, leading to careers in technological fields. But the greatest impact can probably be made concerning the recreational aspects, to the effect that many pilots, technicians, engineers, and executives find model flying to be a great release from the daily job pressures, enabling them to better cope with the problems involved.

In the end, however, all the positive aspects of the activity can be ignored if maximum safety of operations is neglected. Here again the possibility of careless or irresponsible actions by a few needs to be minimized by the concerted efforts of the rest. Where such actions have been tolerated in the past they need to be eliminated in the future, starting NOW.

This is not mere sermonizing. It is the handwriting on the wall which says that another near collision can result in drastic reaction. We have, in effect, been given a warning to prove that self-regulation can prevent recurrences. Failure to do that can be expected to result in regulation being imposed on us from outside.

Our greatest danger at present is a tendency toward tolerance of unsafe flying even though we condemn it and have various rules against it. This refers to club activity in which a few people habitually ignore club safety regulations and club officers are reluctant to be tough about enforcement. It also refers to individuals who have taken chances while flying, knowing that equipment failure could result in dangerous situations.

The warning of the N.Y. meeting is that the time is now to end our tolerance of the past and to organize our flying activity more effectively to minimize the chances of another incident which could bring on intolerant regulation. The proposals produced by the N.Y. meeting are therefore worth closer study.

The point concerning only organized flying in Terminal Control Areas is related to the need for any model flying to be known to FAA Traffic controllers. This suggests that flying may only be permitted in designated areas and only certain kinds of flying at that. Control Line would not be involved since such flying is tethered does not actually get completely free of the ground. Free Flight, however, may be impossible in TCA situations, although limitations on size and weight may permit flying small or lightweight models.

If any controls or limitations are involved, the need for organized activity is all the more emphasized, with a safety or control officer present to enforce requirements. This ties in with the suggestion for TCA tower frequencies to be monitored at all times. Receivers for such monitoring are relatively cheap and within the means of

clubs. But the most important point brought out in the discussions relating to these proposals was the need for someone not flying to be responsible for the actions of all others at the model field.

Along with this basic arrangement it was suggested that AMA could help provide additional incentive by voiding insurance coverage for any model flying not conducted in accordance with the TCA requirements. It was suggested that this be made part of the proposed new AMA Safety Code currently being considered by the AMA Executive Council.

Fail-safe radio control flying was also proposed. It was noted that self-neutralizing controls would not provide the kind of safety desired. In the event of radio failure a free-flying model is NOT desired. Preferred is immediate descent to earth although it was acknowledged that a crash dive was not necessarily good, either...such an event could be dangerous over spectators or unknowing general public.

A gliding model without control was felt to be highly dangerous, especially if it would be caught in a thermal and drifting out of sight. It was noted that the incident in question most likely involved such a model. It was reported to be at 2,000 feet...far above normal RC flying altitudes since visibility would be extremely poor (a six foot model at that altitude would be equivalent to less than one-sixteenth of an inch at arm's length). RC flying normally takes place at well under 500 feet, simply because the model has to be kept that close to be able to tell what it is doing.

With gliding or diving models not considered safe in case of control loss, a compromise solution has been suggested. This is to "dethermalize" the model; a practice now standard for free flight competition models. This would be relatively simple to do, by causing the horizontal stabilizer to deflect upon signal loss. The resultant rapid but flat descent of the model would probably be the safest situation obtainable.

This appears to be preferable to an earlier FAA proposal...back in '63... that all models be equipped with fail-safe parachutes! this proposal was seriously considered but shelved since it might be ineffective due to the possibility of the chute providing enough lift under certain conditions to nullify the desired result. But whether by chute or by dethermalizer, the thinking is still there that fail-safe operation is desirable.

All of the proposals concerning operation and control, however, were considered secondary to the prime need for publicity concerning the problem. FAA and AMA officials agree that a maximum effort needs to be made, especially through the model industry, to alert all model flyers to the concern for immediate attention to safe flying practices, before something worse happens than another near collision incident.

Model publication representatives present promised a major campaign would be initiated and that full co-operation by the industry could be expected. In addition to reporting on the N.Y. meeting, regular promotion of safe flying practices was offered. It was also suggested that a campaign to provide each model flyer with a safety code would be pursued, with the object of having such codes displayed on the tool kits of flyers.

Printing of such codes could be a joint effort of AMA, publishers, and model manufacturers. The goal would be to saturate all outlets...clubs, hobby shops, kits, and other means of distribution...with self-stick or decal type printed codes and slogans. The need to reach all model flyers, including non-AMA members, was stressed. Those outside of organized activity are in particular need of getting the message if the effort is to be effective.

Close cooperation between AMA, model press and hobby industry leaders was promised to develop a unified approach to publicity aspects of the problem, with FAA officials to be kept informed of progress. Good communications between all parties was acknowledged to be vital. Accordingly, a distribution list of concerned people is to be prepared and made available.

The N.Y. meeting ended without specific action being taken in any direction but it was obvious that the AMA leadership is expected to pursue the proposals for eventual (soon as possible) adoption of more effective safety practices for model flying.

Also, although the N.Y. meeting was treated as a local problem it was plain that national response is expected since the same dangers apply elsewhere. Additionally, it was concluded that the dangers go beyond flying problems in TCA areas...they ap-

ply everywhere that full scale and miniature aircraft are likely to use the same airspace.

Al D'Amico, Vice-President of the Pennsylvania Avenue Radio Control Society (PARCS) and a radio news broadcaster for N.Y. station WPIX, organized the meeting as a concerned model flyer and member of the news media who felt that direct communication was needed between all interested parties in order to clarify details of the incident and any implications which might result. Also present were other club officers: Sal Alu, President, and Bob Duran, V.P. of the Pan American Model Aero Club: Irwin Perlman, President, and Richard Brooks, Secretary of the Radio Control Society of Marine Park: John Pimental, President, Blue Angels RC Club.

AMA officers present from District II (New York, New Jersey) were: Joe D'Amico PARCS Field Controller and AMA Associate Vice President for Radio Control: Bill Boss, AMA Vice President; attending from Washington, D.C., was John Worth, Executive Director.

Don McGovern, Editor of Flying Models, represented both his magazine and others, as well as the Suffolk Falcons Club of Long Island. Another joint representative was Bob Caplan, FAA Air Traffic Controller and also a member of the Suffolk Falcons Model Club.

FAA N.Y. area representatives were: John Harris, Air Carrier Operations Inspector; E. Silverman, Operations Branch; H.C.Spiselman, JFK Tower.

Military representatives were: Commander P.A. Ammons, Commanding Officer, Naval Air Station, New York (Floyd Bennett Field): Commander D. L. Muir, Executive Officer, Coast Guard Air Station, Floyd Bennett Field.

Representing the New York City Police Department, Aviation Unit, was Captain Robert Oberle.●

Laird . . . . . .

Continued from page 00

they must be strong and light. Make them from very hard one thirty-second sheet, or if its available at your hobby shop, cut them out of one sixty-fourth plywood. (This very thin ply is available from "Sig".)

Third, the plastic propellers work well, but for even better flight times, a carved wooden propeller with wider blades will give longer durations.

Fourth, all cowling details shown, and there are many more shown on Mr. Hirsh's three views, are made from balsa scraps or whatever else is suitable from the scrap box.

Fifth, cover the model with light weight tissue. Shrink it with a fog of water and when dry dope the wings and tail with one coat and the fuselage with two coats of thin dope. Use tissue for color trim and numerals, and felt pen for coloring the struts and wheels. A light coat of dope will fix the felt pen coloration so it won't run if your model lands in the dew.

Sixth, a single loop of three-sixteenth flat rubber about ten or twelve inches long is the right power for the model as shown. Wind it with an indoor winder after lubing it with rubber lube. Have a helper hold your model while you stretch the motor out at least three feet at the start of winding. As you put in the turns gradually let the motor decrease in length until the noseblock is in its proper place as you finish winding. For a beginner in rubber scale modeling, this technique of stretching the motor

will allow many more turns to be wound into the motor and give much longer flights than simple hand winding of the propeller with the noseblock in place on the front of the fuselage.

Seventh, there should be no warps or twists in any of the flying surfaces. With this type of wing strut, a warp is hard to remove after the struts are installed, so carefully check the wings before installing the struts.

We've had a lot of fun with our Lairds, happy flying with yours.●

C W Junior . . .*Continued from page 13*

half, add an inch for good measure (looks like about 11½ inches), and start by making the two bends that will give you the two main legs and the part across the top. Now measure 8¼ inches down each leg, make the right-angle bends and cut off the excess. At this point, and no sooner, you can cut out the plywood strut supports, altering the slot positions in accordance with how your bends came out.

Incidentally, if you don't have the use of a table saw for routing the grooves in 3/16 inch ply, build up the strut supports from 1/16 and 1/8 ply, using epoxy for the assembly.

The center section/engine nacelle is made up of plywood and balsa. The bottom, under the 3/32 inch ply floor is open. This area houses the aileron bellcrank which links the individual wing-mounted pushrods to the nylon tube and cable pushrod from the fuselage mounted servo. This area under the floor also provides access for attaching the wing hold-on rubber bands to the root rib cup-hooks. Note that the 1/16 inch ply sides of the nacelle must be slipped over the wire wing dowels *before* assembly of the nacelle.

Depending on the engine used, a left-hand prop may be necessary. For some engines, you can obtain a left-hand crank. If not, it isn't all that bad to carve your own prop, and chances are you'll never need more than one. If you still have your September 1969 M.A.N. around, you'll find an excellent article on prop carving by Chuck Gill. Grish makes 8 x 6, 9 x 6, and 10 x 6 pusher props, but a low pitch, large diameter prop seems better for this model.

The wings are standard construction with two inner main spars, false ribs, and a sturdy leading edge set diagonally. The dowel supports are hardwood pieces drilled to take 1/8 inch inside diameter brass tubing. The plug-in design may seem inadequate at first glance, but remember, the wings aren't cantilevered in the same fashion as most gliders, but are supported by very functional struts.

The best way to position the dowel support blocks is to install them loosely, block the wings up on a flat surface with the proper dihedral, and insert temporary 1/8 inch music wire dowels. When everything is in alignment, sock the epoxy to it.

Radio-electronic supply houses usually carry spade bolts, if you can't find them in the hobby shops. These are installed in well-epoxied plywood beds to hold the strut ends.

When building the struts, first rig up the wings and block them into proper alignment and dihedral. Now, with the plane in front of you as a guide to proper strut length, you can make up the four required. Unless you're an absolute perfectionist, none of the four struts will come out the same length. When

they're all in place and adjusted to length (small changes can be made by bending the 1/16 inch wire ends), remove them one at a time and scribe identification marks on one end of each dowel. We use FR, FL, RR, and RL. The balsa streamline fairing is a final touch that is not necessary, but certainly improves the appearance.

The landing gear is scale in size and position. When flown from grass fields the plane will sometimes ride up on its nose, mostly due to the high thrust line. If you feel this will be a problem, the gear could be moved forward; however, generous portions of up-elevator when first applying power will usually overcome the problem.

The plane as shown is very close to scale. Karlstrom 3-views were published in the July 1957 M.A.N., and U.S. Civil Aircraft Vol. IV by J.P. Juptner has the full particulars. Whether you build it for scale competition or not, putt-putting around with the C.W. Junior is different, relaxing, and just plain fun . . . and one prop can last forever.●

Pylon . . . . . .

Continued from page 22

Availability of kits is still pretty slim. Airtrol will have a plastic T-tail Rivets soon. Sig's "Doubler" can be converted to a "Little Gem" Goodyear racer. Francis Products has a Minnow and P-51 with fiberglass fuselages.

The O.S. 15 R/C engine is the most popular so far. The Supertigre 15 won the big race in October. A three-ounce tank is about right.

One aileron is sufficient for control. Less work to build, less linkage. Doesn't seem to matter on which wing it is used.

Two-pylon race course works very well, even for big open pylon races. It is a much safer arrangement as only the pilots and helpers are on the field.

Here are some design optimums that have been developed by the Mentor group:

Prop to C.G., 9 inches.

C.G. to elevator hinge, 21 inches.

C.G. at 25 to 30 percent of wing chord.

Landing gear axle under leading edge or about 2 inches ahead of C.G.

Symmetrical airfoil, with sharp leading edge. Average wing is 8 x 40 inches.

Zero decalage. No dihedral except for appearance.

Stab area, 50 to 60 square inches.

Elevator is just under one-fourth of total stabilizer area.

Vertical stabilizer is 25 sq. in. area with rudder one-fourth of total area.

Aileron is 10 sq. in. each for two, 15 sq. in. for one.

Control surface travel, 1/8 inch.

Wash out wing panels 1/16 to 3/32 inch each.

Q.M. rules for 1972 will require power-on landing for heat to count. Failure to do so will cause 30 second penalty (!).

Winner is best two times, averaged.

What about the San Francisco QMers? Let's hear from you.●

Free Flight . . . . . .

Continued from page 16

Flight Contest Board has decided that both classes should use the same flyoff system. Otherwise Cat. 1 designs will not be suitable for Cat. 2 competition.

If Cat. 1 rules stayed the same, models for this class would grow in size. Cat. 2 models would shrink at the same time. Since flying fields are getting smaller, Cat. 2 contests will become dominant. The FFCB agreed that we must change the Cat. 1 rules at the same time we change the Cat. 2 rules, to prevent obsolescence and dilution of design effort. Cat. 1 models should be competitive in Cat. 2 and vice versa.

How can you get prepared for the 1972 season? The same way thousands of others have prepared for the Nationals the last three years. Competition Model's Stardusters and Kyosho Galaxy's are still placing at Chicago. And if your bag is scratch building, study the designs flown by expert flyers such as Jim Clem, Dick Mathis, Dave Linstrum and Bill Chenault.

QUESTIONS AND ANSWERS

Your Free-Flight columnist is ready, willing and able to answer your questions concerning rubber, gas, and glider free-flight. Answers of a general nature will be published in this column. All questions will be answered by mail individually if you enclose a stamped, self-addressed envelope. Write either to the magazine, Attention Mel Schmidt, or directly to Mel at 1140 Sturbridge, La Habra, Calif. 90631.

BALSA WOOD WEIGHT-GRAMS

For the technically minded, here is a chart of standard sheet sizes of balsa wood and the weight of each in grams. The chart was developed by George Bahrman and is for balsa weighing 5 pounds per cubic foot through 8 pounds per cubic foot.

Balsa Wood Size	5 Pound		8 Pound
1/32 x 3 x 36	4.3	–	7 grams
1/16 x 3 x 36	8.7	–	14 grams
3/32 x 3 x 36	13	–	21 grams
1/8 x 3 x 36	17.4	–	28 grams
3/16 x 3 x 36	26.1	–	42 grams
1/4 x 3 x 36	34.8	–	56 grams
3/8 x 3 x 36	52.2	–	84 grams
1/2 x 3 x 36	69.6	–	112 grams

Classroom . . . . . .

Continued from page 27

hub itself. You could stop at this point if you want to, but there's one more step that will result in a perfectly realistic wheel. At this point the inside surface of the rim is flat, but all wheel rims have a crown to them. So, using a sharp toothpick, apply epoxy to the inside face of the wheel rim, between all the spokes. The epoxy will flow smoothly around the base of each spoke, forming what looks like the nipple end of the spoke and the dimpling of the rim as well. Don't be afraid to load the epoxy in there because there's a way to remove the excess: When the epoxy is in place, and before it begins to cure, spin the wheel by twirling the hub tubing between your fingers. Centrifugal force will pull the excess epoxy off the rim, and at the same time will cause the cement to flow evenly into a perfect crowned surface on the rim. Continue twirling until the epoxy cures enough so it won't sag to one side of the wheel. All that's left now is to trim the excess tubing from the ends of the hub, paint the completed wheel silver (or whatever), and mount the tire. What should you use for a tire? I use balsa, but you can use a rubber "O" ring if you can stand the weight.

Put the wheels on your model, then go out and smirk as the other guys ask you how you made those wheels. ●

Moving day!! Pete Bechtel, who has taken over the complete stock of Willoughby Enterprises, checks Dale's collection before loading the truck to head back to Santa Rosa with his loot.

Twin . . . . . .

Continued from page 19

on the wing with nylon bolts, eliminating all of those rubber bands that would be running back and forth over the wing. Width of the pods may vary to accommodate your engine and tank installation, but don't lose the downthrust alignment.

The original airplane was moderately spry on two O.S. Max 30's, but with today's light radios and covering material such as Monokote, this size engine should be more than adequate. The Series 71F K&B 40 would also be an ideal engine choice provided you don't plan to enter the RDF in an AMA Pattern event! ●

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KWIK-FLI III . . . World and twice Nats. winner. Designed by Phil Kraft. Span: 60" Eng.: 45 to 61 Kit RC-12 **39.95**
Includes T.A.C.—Ready made wing fixture

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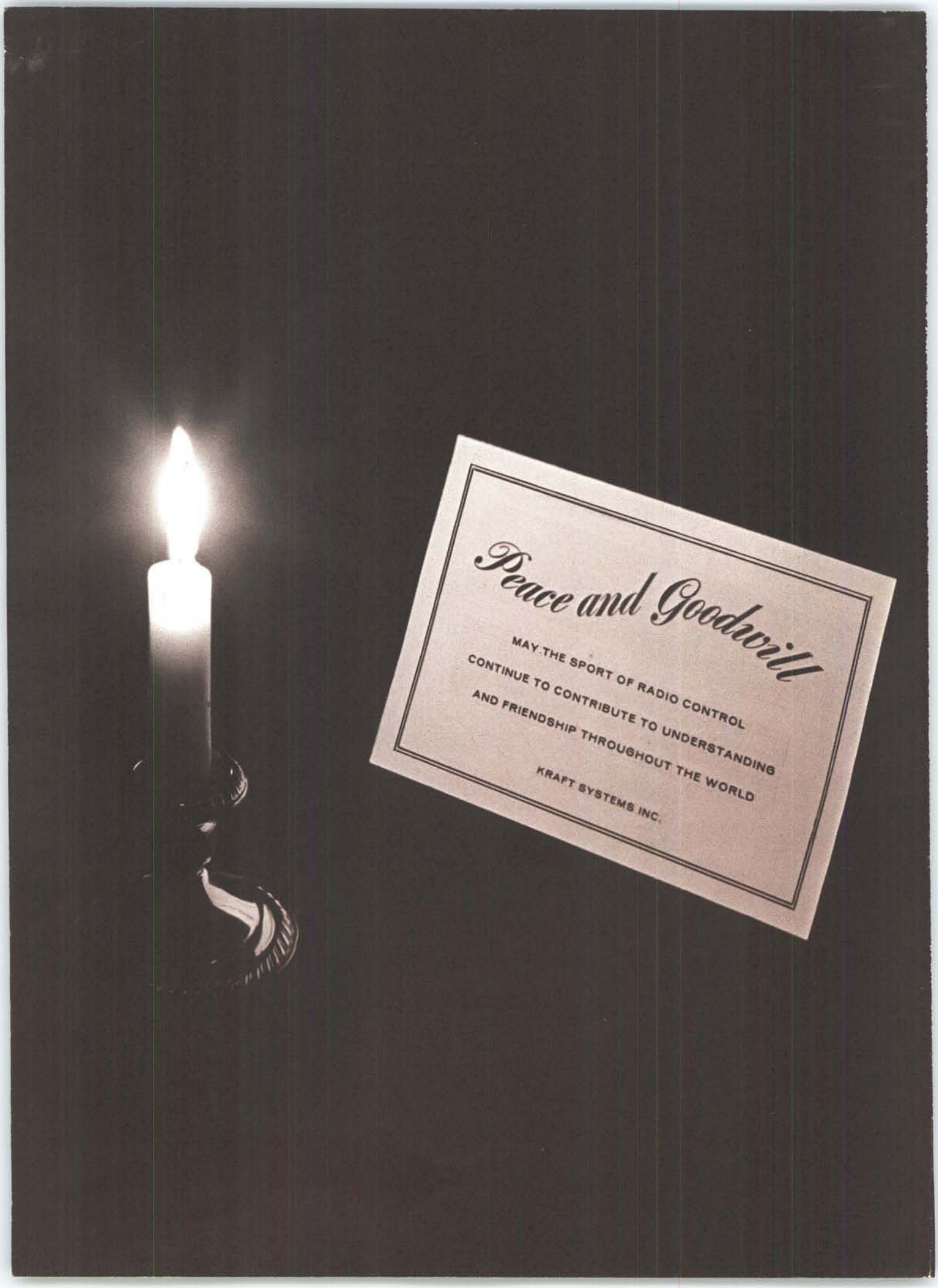
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